Department of Biochemistry
University of Wisconsin - Madison

2012 Review
Department of Biochemistry 2012
( “ten year review”, last reviewed in 1996 )

Table of Contents
I. Overview of the Program ................................................................. 2
II. Faculty and Research/Scholarly Work ........................................... 5
III. Educational Programs and Students ........................................... 8
IV. Staff and Infrastructure ............................................................... 11
V. Outreach and Wisconsin Idea ...................................................... 14
VI. Leadership and Governance ........................................................ 15
VII. Budget and Funding ................................................................. 17

Appendices
1. IPiB Graduate Program Self Study 2012
2. List of Biochemistry Department Faculty
3. Curriculum Vitae of Faculty
4. Joint Appointments Held by Faculty
5. Faculty Comings and Goings Faculty
6. Summary of Extramural Grant Funding
7. Signature Faculty Activities in 2011
8. Faculty Awards
9. Departmental Policy and Procedures Regarding Promotion of Probationary Faculty
10. Departmental Seminars/ Symposia
11. Graduate Students Publications
12. Undergraduate Degree Requirements
13. Overview of Undergraduate Program
14. Departmental Undergraduate Summer Research Scholarship Program
15. List of Undergraduate Hilldale Fellowship Awardees
16. 2011-2012 Teaching Activities
17. Biochemistry Newsletters
18. Department Committees
19. Post-tenure Review Procedure
I. Overview of the Program – Department of Biochemistry

1. Mission and purpose

The Department of Biochemistry was founded in 1883. Over the intervening 129 years it has become known for its scientific and economic innovation, as well as leadership in biochemical research and education. The department foresees a continuation and expansion of that tradition, utilizing an updated and invigorated blend of: (1) world-class research; (2) rigorous training of future PhD-level research scientists; (3) dedicated preparation of undergraduates for a wide range of career options critical to the future of the state, the nation and the world; and (4) an expansion of interdisciplinary cooperation.

Excellence in teaching, research and public outreach is central to the mission of the campus as a whole, as well as the College of Agricultural and Life Sciences (CALS). Although not mentioned directly in the departmental statement, we point out that outreach is a priority, both through an emphasis on the translation of fundamental discoveries into the practical applications in the private sector and development and participation in hands-on programs in K-12 education (as described in section V).

2. Relationship/connection to other units/academic programs

The Department of Biochemistry in CALS is one of two “biochemical sciences” departments on the UW-Madison campus. The other is the Department of Biomolecular Chemistry of the School of Medicine and Public Health (SMPH). Six years ago the two departments merged their independent graduate programs into the “Integrated Program in Biochemistry” (IPiB). IPiB is undergoing its first review simultaneously with the departmental review. That review document can be found as Appendix 1. As of January 2012 the faculty of the two departments occupy adjacent physical space with the completion of the Biochemical Sciences Building and remodeling of the 1912/1937 “Biochemistry” and the 1906 “Agricultural Journalism” buildings – see Section IV.2. This physical proximity will facilitate collaboration, sharing of instrumentation and joint seminar programs.

3. External reputation

Since the origin of the program, Biochemistry at UW-Madison has consistently been ranked in the top tier of biochemistry graduate programs. Two of the most recent (2010) rankings are listed below. It should be noted that biochemistry program rankings have limitations due to the wide breadth of the discipline, which spans biology, chemistry, and physics, and to the significantly different organization of programs at different universities, as well as the fact that biochemistry is sometimes ranked as a subfield within other disciplines (e.g. within chemistry in the US News rankings).

-- The U.S. News & World Report annual educational ranking has placed UW-Madison as one of the top 5 out of 197 Biochemistry graduate programs. (http://graduate-schools.usnews.rankingsandreviews.com/best-graduate-schools/top-chemistry-schools/biochemistry-rankings for the 2010 rankings)

1. Harvard University
2. University of California – Berkley
3. University of California – San Francisco
4. Scripps Research Institute
5. University of Wisconsin – Madison

6. Massachusetts Institute of Technology
7. Stanford University
8. California Institute of Technology
9. Yale University
10. University of California – San Diego

-- Phds.org placed UW-Madison as one of the top 10 larger Biochemistry, Biophysics and Structural Biology graduate programs. (http://graduate-school.phds.org/rankings/biochemistry/rank/larger)

1. Harvard University (Molecular and Cellular Biology)
2. Harvard University (Biophysics)
3. Massachusetts Institute of Technology (Biology/Biochemistry and Biophysics)
4. University of California – San Francisco (Biochemistry and Molecular Biology)
5. Yale University (Molecular Biophysics and Biochemistry)
6. University of California-Berkley (Biochemistry and Molecular Biology)
7. California Institute of Technology (Biochemistry and Molecular Biophysics)
8. Stanford University (Biophysics)
9. University of Wisconsin-Madison (Biochemistry)
10. University of California- San Francisco (Biophysics)

These high national rankings are underscored by the list of national and international honors and leadership roles of individual departmental faculty (see II below).

4. Emerging trends
The demographic distribution of our faculty is one of the greatest challenges facing the future of the department (see Appendix 2). As of May 2012, 16 professors, 44% of the faculty in the department, are 60 years of age or older (with 7 members 65 or over). Only 9 of our faculty are under 50. We believe that the future of the Department depends upon a steady and well-thought out plan for hiring junior faculty over the next decade. Outstanding prospective faculty are most easily recruited into outstanding departments. In this effort, we need to take advantage of the remarkable strength and expertise of our current faculty to attract new junior faculty who will have the vision and cutting edge skills to maintain and enhance the eminence of the department.

Biochemistry is a rapidly changing discipline, central to all life sciences. It is not centered on a single type of organism or technique, but rather focuses on applying quantitative approaches to understanding biological systems through the interfacing of chemistry and biology. Therefore, we believe that the key to future success of the Department of Biochemistry is the hiring of candidates with training in state-of-the-art technologies that cross multiple disciplines. The individuals we seek must be flexible and able to take advantage of rapidly emerging areas. Ideally, they will be defining those new frontiers themselves.

Our strategy in future hiring will be to consider both the technical disciplines and approaches utilized by the applicants and the biological areas of their proposed research program. Cutting-edge techniques are fundamental to advances in modern biochemistry and therefore represent crucially needed additions to our current research capabilities; examples of critical needs include proteomics/metabolomics, nano- or metabolic-engineering and quantitative imaging of molecules both in vitro and within cells and animals. Moreover, core areas of biochemistry (e.g. enzymology, natural products) have been rejuvenated with modern technologies. However, these classic, but central, fields remain in the hands of aging members of our department. Furthermore, certain problems once deemed unapproachable have become tractable in recent years with the advent of new molecular approaches (e.g. the study of complex systems within metabolism, neurobiology, membrane biology). Addition of these emerging areas to the Department of Biochemistry are essential to maintain the position of the department, and indeed UW-Madison, at the frontier of biochemical research. Their addition is crucial for recruitment of the best and brightest students, for the continued generation of federal and non-federal funding and for innovations leading to patents. In searching for new faculty, we aim to fill voids in both these technological and biological areas, realizing that this can often be accomplished at the forefront of emerging areas by identifying outstanding candidates that combine these different types of technical and biological expertise. Thus thoughtful re-evaluation after each hire will be essential and appropriate as the department is rejuvenated.

5. Response to previous program review recommendations
The most recent review of the department took place in 1996 by a panel composed primarily of reviewers from outside the university (5 outside/1 UW-Madison). The 10 major recommendations, together with our comments, are listed below.

(1) We recommend that the Dean establish better communications between his office and the Department by occasionally meeting with the Biochemistry faculty. Perhaps once every year or two.
**COMMENT:** The college has had 6 different deans (or acting deans) in the past 7 years. The amount of interaction between the department and deans has varied. We look forward to interactions with the present dean, Kate Vandenbosch, who arrived in March 2012.

(2) We recommend the carrot approach for promoting and establishing closer interactions between basic and applied scientists in the College. We understand that there is an existing program which offers $40,000 per year grants to pairs of faculty applicants for projects involving joint research aimed at cooperative programs. We recommend that the availability of these grants be widely publicized.

**COMMENT:** Although the program alluded to appears to have fallen by the wayside, the new Wisconsin Institutes for Discovery and Morgridge Institutes provide new opportunities to foster the kinds of collaborations envisioned in this recommendation. The opportunities are further enhanced by new initiatives such as the Great Lakes Bioenergy Research Center and Wisconsin Energy Institute.

(3) We recommend that every effort be made to provide more secretarial support to the faculty. A mechanism to use indirect cost funds generated by NIH grant funds has been developed by the faculty.

**COMMENT:** With changing times, the department has been putting resources into developing centralized resources to efficiently aid faculty and other members of the department, including development of an intranet, the purchasing system and other WEB-based interfaces.

(4) We recommend that the Dean’s office use its influence to develop a streamlined computerized purchasing program.

**COMMENT:** Because movement was so slow at the campus level, the department took it upon itself to develop a WEB-based purchasing system. This has proved both efficient and cost-effective. Other programs (i.e. Department of Chemistry and the Great Lakes Bioenergy Research Center) have either partially or fully adopted the system.

(5) In the area of faculty recruitment, we recommend:
   a) and endorse the decision to recruit in the areas of eukaryotic molecular biology, structural biology, plant molecular biology.
   b) filling an open position with a big molecule NMR person.
   c) that current strengths in the fields of molecular endocrinology and nutritional biochemistry maintained.
   d) that consideration be given to recruiting in the areas of signal transduction, molecular genetics, gene expression and developmental biology.
   e) and endorse the plan to develop a new “Molecular Medicine Institute”.

**COMMENT:** Please see section I.4.

(6) We recommend enhancing the undergraduate experience by expanding the formal laboratory offering.

**COMMENT:** The undergraduate laboratory has been redesigned and revamped in the past few years, including the incorporation of a seminar component to provide the students with a cohesive and integrative capstone experience. In addition, the department has developed a new program, called Biochemistry Scholars, to pull outstanding majors into research laboratories early in their careers, and provide them with enhanced research experience over multiple years.

Please see section III and Appendix 14 for a more detailed description of the changes implemented.

(7) We recommend a revision in the teaching program so that the graduate students actually receive “teaching experience.”

**COMMENT:** In part, this comment stemmed from a misunderstanding by the review committee. Even in 1996, graduate students had a variety of opportunities to gain teaching experience in the laboratory course, leading optional discussion sections of the large undergraduate courses. Now graduate students
(and postdoctoral scholars) also have opportunities to actively participate in teaching in the graduate class Biochemistry 660. In addition our graduate students take advantage of other opportunities to gain teaching experience. One example is the DELTA program, a project of the Center for the Integration of Research, Teaching and Learning (CIRTL), a National Science Foundation Center for Learning and Teaching in higher education on the University of Wisconsin–Madison campus (http://delta.wisc.edu/). The mission of DELTA is the development of a future national faculty in the natural and social sciences, engineering, and mathematics that is committed to implementing and advancing effective teaching practices for diverse student audiences as part of their professional careers. In addition, the Wisconsin Program for Scientific Teaching, which has the goal of enhancing undergraduate biology education by training instructors to apply the scientific approach of research to teaching and learning offer a Teaching Fellows Program and a Scientific Teaching Postdocs Program (http://biology.wisc.edu/UniversityEducatorsOurMissionforUniversityEducators.htm).

(8) We recommend an overhaul in the "New Student Orientation Committee" so that it can provide more assistance to new incoming students.

COMMENT: The "New Student Orientation Committee" has been reorganized upon the formation of the “Integrated Program in Biochemistry” (IPiB). Student responses indicate that the assistance they receive from the committee greatly facilitates their integration into the IPiB program.

(9) We recommend continued scrutiny of the average total time required for the Ph.D. degree.

COMMENT: The average years to degree has decreased from 6.0 years in 1996 to 4.98 years in 2011 (source: 2011 Gradate Program Profile)

(10) We recommend that the decision on the selection of new faculty and fields of research be placed in hands of the Department. This does not mean that we suggest that the Biochemistry Department act in a vacuum. Presumably, in selecting new appointees, the Department will know of other developments in college and thus will be in a position to avoid duplication of other departmental efforts.

COMMENT: The possibility of hiring and the focus of research areas is an ongoing discussion with the college.

II. Faculty and Research/Scholarly Work

1. Faculty demographics and recruitment/retention patterns

As of July 1, 2012, the professorial staff of the Department of Biochemistry (Appendices 2 & 3) consists of 36 faculty members: 9 women and 27 men. 18 have 9-month (academic year) appointments; 18 have 12-month appointments. Faculty are nearly evenly split between the Biological and Physical Divisions, 20 and 16, respectively. 27 faculty members have 100% appointments within the department. 9 faculty have joint appointments of between 25 and 50% (Appendix 4) distributed among the Departments of Chemistry, Mathematics and Nutritional Sciences, the School of Pharmacy and the Graduate School (Institute of Molecular Virology and Biotechnology Center).

A major challenge for the Department of Biochemistry over the next 10 years is its aging demographics. Figure 1 shows the faculty age distribution compared to CALS overall. Since the time of the last review in 1996, the department has undergone numerous faculty changes. Presently there are five Assistant Professors in the department: Weibel, Senes, Pagliarini, Hoskins and Wildoner. These new hires came about, in part, because of the recognition by the Dean's office of the severe age demographics of the department pointing to massive retirements over the next decade, and in part because of the large amount of effort that several Biochemistry faculty devote to the Great Lakes Bioenergy Research Center (Amasino, Fox, Landick and Ralph) that curtailed their normal activities within the department. These new assistant professors have begun a rejuvenation of the department, but the demographics remain very skewed. Today, the average age of the faculty in Biochemistry is 57. In part, this apparent disconnect between the number of faculty joining the department since the last review and the average age of the faculty is due to
Awards, 5 have received WARF or other university-wide professorships, 4 have received university-wide or system-wide teaching awards and 6 have been honored with the Hilldale Award that recognizes scholarly work and collegial contributions to the UW-Madison.

### Snapshot of Biochemistry Faculty Awards

<table>
<thead>
<tr>
<th>Award</th>
<th>Recipient</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>MacArthur Foundation Fellowship</td>
<td>Laura Kiessling</td>
<td>1999-2004</td>
</tr>
<tr>
<td>U.S. National Academy of Sciences</td>
<td>Richard Amasino</td>
<td>2006</td>
</tr>
<tr>
<td>American Academy of Arts and Sciences</td>
<td>Thomas Record</td>
<td>2007</td>
</tr>
<tr>
<td>U.S. National Academy of Sciences</td>
<td>Laura Kiessling</td>
<td>2008</td>
</tr>
<tr>
<td>Searle Scholar Award, Kinship Foundation</td>
<td>Douglas Weibel</td>
<td>2008</td>
</tr>
<tr>
<td>Council, National Academy of Sciences</td>
<td>Judith Kimble</td>
<td>2008-2010</td>
</tr>
<tr>
<td>University of Wisconsin Regents Teaching Excellence Award</td>
<td>Michael Cox</td>
<td>2009</td>
</tr>
<tr>
<td>Repligen Award in Biological Chemistry, Amer. Chem. Society</td>
<td>Ronald Raines</td>
<td>2010</td>
</tr>
<tr>
<td>WAA Chancellor’s Distinguished Teaching Award</td>
<td>James Ntambi</td>
<td>2010</td>
</tr>
<tr>
<td>Searle Scholar Award, Kinship Foundation</td>
<td>David Pagliarini</td>
<td>2011</td>
</tr>
<tr>
<td>American Academy of Arts and Sciences</td>
<td>Marvin Wickens</td>
<td>2011</td>
</tr>
<tr>
<td>President’s Committee on National Medal of Science</td>
<td>Judith Kimble</td>
<td>2012-2014</td>
</tr>
</tbody>
</table>
2. Diversity Characteristics
Diversity of the intellectual community is a core value of the Department of Biochemistry and is critical to our excellence and success. However, as can be seen from the statistics, we have struggled to attain our goals. 1 faculty member is an unrepresented minority. 25% (9) of our faculty are women. This number is concerning, not only because we would like it to be higher, but because of these 9, only 2 are under 50; 4 are in their 60s. During our faculty recruitments we have actively searched for women and minority candidates. Indeed several of our unsuccessful recruitments efforts over the past decade were for women candidates. Putting together attractive spousal hiring packages has been a major impediment to hiring. This has been a more severe problem in recent years as the support for such packages at the university level has substantially diminished.

3. Mentoring and support for faculty
The Department of Biochemistry is committed to supporting our probationary faculty by offering competitive salaries, start-up packages and mentoring on both research and teaching issues. Upon arrival, a faculty mentor who serves in this capacity throughout the pre-tenure years, is appointed. In addition, a tenure committee, on which the mentor serves as an ad hoc member, is appointed within the first few months. Throughout the pre-tenure years, the tenure committee serves as a resource to guide and advise the junior faculty member. Beyond this informal assistance, the department follows “Faculty Policies and Procedures” (FP&P) regarding the formal annual review process.

The prevailing attitude in the department is that we want our junior faculty to be successful. We cannot be successful for them, but we can create an environment that allows them to be successful, and we strive to do this. It is also understood that the pre-tenure years are stressful. The department strives to assist junior faculty with work-life balance issues. Faculty members are especially encouraged to take advantage of university programs such as tenure-clock extensions following the birth or adoption of a child. The official policy of the department regarding promotion to Associate Professor with tenure can be found as Appendix 9.

4. Intellectual life of unit
Faculty, staff and students interact in diverse ways to present and discuss their scholarly activities. Most prominently, the department sponsors two seminar series, one each in the fall and spring semesters. In the fall semester, the “Contemporary Biochemistry” series focuses on a general theme. The organizing committee typically includes a mixture of faculty from Biochemistry and other departments as organizers. Recent series have been: 2011: Structural Biology; 2010: Regulation of metabolism in health and disease; 2009: Membrane organization and dynamics; 2008: Biofuels; 2007: Biochemistry of the nucleus. In the spring semester we sponsor the “Biochemistry Colloquia,” which covers a more wide-ranging set of current topics in the discipline. We are also fortunate to have gift funds designated for a number of named lectureships, including the Green Lecture, focused on enzyme mechanisms, and the Steenbock lectures, which allows the department to sponsor lectures from the most prominent leaders in the field of biochemistry. The Everson Lectureship is designed specifically to bring back to the department successful former graduate students and postdoctoral fellows. These seminars are the favorite of many in biochemistry, looked forward to by both the present students/postdocs and those returning to talk about their work (see Appendix 10 for complete lists of seminars).

The IPiB graduate program organized a one-day retreat for all people working in Biochemistry and Biomolecular Chemistry department laboratories in September of 2011. Graduate students, postdoctorals and junior faculty discussed their research in talks and poster sessions. The structured time as well as the meals and evening entertainment foster interactions and potential collaborations. The plan is to hold such a retreat every other year. In addition, the weekly IPiB student seminar series, open to all, provides another venue for sharing scholarly work.
5. Research foci and funding patterns/trends
The research in the department encompasses the full spectrum of biochemistry, from in vivo studies to detailed chemical analyses, focusing on applying quantitative approaches to understanding biological systems. The scope of work within the Department of Biochemistry includes atomic, molecular, cellular and organismal studies. We consider this diversity a major strength of the department and aim to maintain it.

The faculty of the Department of Biochemistry have been quite successful in obtaining extramural research funding, totaling ~$18,000,000/year in direct costs (see Appendix 6). In the years since the previous review, grants obtained by Biochemistry faculty administrated through the Biochemistry department accounted for 45-50% of the indirect costs coming into the college (except during the years in which the Great Lakes Bioenergy Research Center was located in CALS). In these years the percentage was 33%. However, it should be noted that Biochemistry faculty members play a major role in GLBRC. All but one member of the management team (and writers of the center’s proposal) are Biochemistry faculty members.

The majority of extramural funding is from the National Institutes of Health (NIH), but a substantial amount is from other federal agencies, including the National Science Foundation (NFS), Department of Energy (DOE), Department of Agriculture (USDA), and the National Institute of Justice (NIJ). Much of the extramural research support is in the form of individual research grants (see Appendix 6 and individual CVs in Appendix 3). In addition, department faculty have been successful in attaining support for larger multi-investigator grants, as well as facility grants. The multi-investigator grants support large collaborative efforts, and the facilities serve other investigators on the UW campus and nationally. Examples include the Nuclear Magnetic Resonance Facility at Madison (NMRFAM) headed by John Markley, multi-investigator PSI-Biology projects (Markley, Pagliarini and Fox) focused on structure and function of mitochondrial and membrane proteins, and a collaborative grant from the National Institute of Justice (Cox) to improve the quality of degraded forensic DNA samples. Like all investigators, the faculty of the Department of Biochemistry are deeply concerned about the future funding trends for research and are working to position themselves in the best possible ways for the future.

Graduate students carry out much of the research done in the department. Thus, in this department, the missions of creating new knowledge and education are tightly interwoven. 151 PhD students work in faculty laboratories. 87 are enrolled in the IPiB program; 64 are enrolled in other programs, including Cellular and Molecular Biology, Chemistry, Biophysics, Genetics, Microbiology, Molecular and Cellular Pharmacology, Mathematics and Biomedical Engineering. Appendix 11 lists the 474 articles published between 2006 and July 1, 2012 with graduate students working in Biochemistry faculty laboratories as first or co-first author.

III. Educational Programs and Students
1. Undergraduate Program
The Biochemistry Department offers an undergraduate Bachelors of Science degree through both the College of Agricultural and Life Sciences (CALS) and Letters and Sciences (L&S). Recently, the ratio of CALS:L&S biochemistry graduates has been ~2:1. Overall, the number of undergraduates matriculating with a Biochemistry degree has steadily increased since 2001 from 73 to 142 in 2011 (Figure 2). In Appendix 12 a complete outline of the degree requirements for both the CALS and L&S tracks can be found, as well as the typical 4-year program. A detailed description of assessment, enhancement to undergraduate education, recent curricular/programmatic changes and enrollment patterns can be found in Appendix 13.

The biochemistry major is designed to fit the needs of the students who plan on graduate or professional school study, as well as those wishing to terminate training at the B.S. level. The basic requirements for the degree include courses in biology and general, organic, quantitative, and physical chemistry. Students concentrate on electives in either of these areas, tailoring their upper-level course
work to meet their interest and future goals. The degree not only serves as an excellent background for medical, dental or veterinary school admission, but also for graduate study in biochemistry or other allied fields such as biology, bacteriology, genetics, molecular biology or oncology. Data from both the college’s and the department’s senior exit survey indicate that in recent years well over 50% of our students attend graduate school in the sciences or enter a professional degree program, typically in medicine or law. 65% of respondents in the 2012 survey are in this category. The majority of the remaining students enter the work force in areas in which they use their scientific training (teaching, research assistants, scientific sales, etc).

As described in more detail in Appendix 13, two major curricular changes have taken place. First, we established Biochemistry 375 (Biochemistry Freshman Seminar). Previously, formal interactions with biochemistry faculty (e.g. taking a “biochemistry” class per se) did not begin until their third year because of necessary prerequisites. We felt that this was far too late in their undergraduate experience. Consequently, a major goal for this seminar is to show the students how the discipline of Biochemistry fits into the broader realm of science and help them determine whether the biochemistry major is the right ‘fit’ for them. We also make them aware of out-of-classroom opportunities open to Biochemistry undergraduate majors as early as their freshman year and in general help them “feel” like a member of the Biochemistry Department. Second, to enhance the capstone experience, two required courses, Biochemistry 511 and Biochemistry 651, were recently combined to provide a single 3-credit capstone course, a revised Biochemistry 651. Biochemistry 511 was a one-credit seminar course that provided students with experiences of reading, interpreting, and presenting primary scientific literature. The “old” 2-credit Biochemistry 651 was primarily a project-based lecture and laboratory course that focused on mastery of modern biochemical laboratory techniques. The integrated 511/651 capstone aims to integrate a diverse body of knowledge and enhance multidisciplinary problem-solving, teamwork and communication skills as well as to address societal, economic, ethical, scientific, and professional issues to specific to the field of biochemistry.

We note that our faculty takes undergraduate teaching seriously. Seven members of the department have won prestigious teaching awards since the last review (see Appendix 8), including the UW System Underkoffler Teaching Excellence Award (Amasino), the Henry Dreyfus Teacher-Scholar Award (Cox, Nelson), the UW Regents’ Teaching Excellence Award (Cox), membership in the UW Teaching Academy (Nelson), the UW Chancellor’s distinguished teaching award (Ntambi) and CALS teaching awards (Bednarek, Friesen, Nelson). Finally, David Nelson and Michael Cox have co-authored five editions of Lehninger Principles of Biochemistry, currently the most widely used undergraduate Biochemistry textbook in the world, which is translated into 12 languages. Cox has also co-authored, with Jennifer Doudna (University of California-Berkeley) and Michael O’Donnell (Rockefeller University) a textbook called Molecular Biology: Principles and Practice, W.H.Freeman Publishers (2012), which is now in first edition.

As a department, we believe that laboratory research experience is invaluable and thus is strongly encouraged. Independent study courses and senior thesis complement and extend these experiences. Approximately 150 undergraduates carry out independent study for credit each year in the laboratories of Biochemistry faculty members. Our undergraduates are successful in winning Hilldale Undergraduate Research Fellowships (see list of successful students working in biochemistry laboratories in Appendix
However, not enough of these campus-wide fellowships are available to provide support for all of the strong biochemistry undergraduates who would benefit from summer research experience. In response, in 2011 the department created the Biochemistry Undergraduate Research Scholarship Program (Appendix 14). The purpose of this competitive program, which is patterned after the university’s Hilldale Program and is supported by a combination of gift funds and grants from outside foundations, such as the Genentech Foundation, is to provide our undergraduate majors an opportunity to gain focused, full-time research experience during the summer early in their academic careers. In addition, under the leadership of Michael Cox, the Biochemistry Department has established a “Biochemistry Scholars” Program to encourage high-performing first-year students to become engaged in mentor-guided research. The program’s broad goals are to provide hands-on research experiences as well as associated professional development such as science writing and presentation and participation in national scientific meetings. Started only 2 years ago, this program now has over 40 students participating. Most students are expected to spend three years total in this program. The capstone experience is a trip to the annual meeting of the American Society for Biochemistry and Molecular Biology, where they present their research in the ASBMB undergraduate research poster competition.

Our undergraduates are encouraged to study abroad. Departmental faculty initiated three programs that provide a new breadth of opportunities (http://www.biochem.wisc.edu/undergraduate_program/default.aspx). The Uganda Study Abroad Program (Ntambi) utilizes field study and classroom learning to focus on major issues that impact health and nutrition in Uganda including economics, politics, health care, HIV/AIDS and education. Students participating in this program register for a 2-3 credit seminar course during the fall semester and conduct a three-week field study in Uganda over the January break. The classroom seminars focus on the broader issues that impact health and nutrition in Uganda including politics, economics, education, history, women’s, studies, nutrition, and HIV/AIDS. During the field study, students visit various health care facilities specializing in nutrition rehabilitation, traditional medicine, and HIV/AIDS. The Khorana Program (Ansari) offers opportunities for students from U.S. universities to pursue a summer of research in India. Students are matched with mentors in India based on research interests at both academic institutions and private companies in India. The SCORE program (Wickens) takes participating students to the United Kingdom, where they spend eight weeks during the summer in a top-notch laboratory in Oxford or Cambridge investigating fundamental problems in biochemistry and molecular biology.

2. Graduate Program

The Biochemistry Department in the College of Agricultural and Life Sciences and the Biomolecular Chemistry Department in the School of Medicine and Public Health first established doctoral graduate programs in the 1880’s and 1920’s, respectively. At that time, the formation of independent graduate programs in the two schools/colleges satisfied the need for specialized training in plant and animal biochemistry in CALS and human biochemistry in the Medical School. However, in the ensuing decades, an understanding of the fundamental similarities of biochemical processes in cells of all life forms has blurred the boundaries between research carried out by students in the two graduate programs. Thus, in 2006, the Departments of Biomolecular Chemistry and Biochemistry crafted a plan for a joint graduate program in Biochemistry, capitalizing on the strong history of graduate training in both departments.

The Integrated Program in Biochemistry (IPiB), which offers a PhD in Biochemistry and a terminal MS in Biochemistry (non-admitting program), is the outgrowth of the 2007 merger between the departmental graduate programs of the two biochemical sciences departments at the University of Wisconsin-Madison. The program represents the best features of each of the departmental programs and highlights an exciting and unprecedented step for cooperation and collaboration in the biochemical sciences at the University of Wisconsin-Madison. The graduate program is also up for its first review, which is being coordinated by the Graduate School and thus carried out independently from the review of the department per se. The IPiB review document, which was submitted on 4/13/2012, can be found in its entirety in Appendix 1. We emphasize that the graduate program is integral to the intellectual fabric of the department. The
The intertwining of graduate education and research within the department cannot be over-emphasized. Again, we point out Appendix 11, which lists the 276 articles published between 2006 and July 1, 2012 having graduate students receiving their degrees in biochemistry as first or co-first author.

The IPiB program provides research opportunities in 49 laboratories (36 in Biochemistry; 13 in Biomolecular Chemistry) whose research spans a considerable range of contemporary topics in biochemical, chemical, and molecular sciences. Currently, IPiB has 110 graduate students conducting research in its laboratories. The combined faculty of IPiB includes world-leading researchers who have made important contributions to unlocking the secrets of plant flowering; protein structure, function and folding; membrane trafficking and transport; vitamin and hormone/growth factor action and signal transduction mechanisms; lipid synthesis and metabolism; RNA splicing, transport and degradation; DNA replication, recombination and transcription; cell division, differentiation and death; viral replication and transcription; animal and plant development and physiology. Most IPiB laboratories also have students from other training programs, including Cell & Molecular Biology, Microbiology, Genetics, Chemistry, Biophysics, and Neurosciences, carrying out their thesis research. The UW campus has a strong tradition of leadership and participation in interdisciplinary and interdepartmental graduate training programs. Interaction and collaboration with students, faculty, and staff of other programs and departments are widespread, which represents a key feature for broad training on the UW campus.

All students who maintain satisfactory progress and continuous enrollment are funded throughout the duration of their graduate studies. The 2012-2013 stipend rate is $24,500. Students also receive tuition remission and fringe benefits (e.g. health and life insurance). The funding is derived from grants to the major professor or from awards made to the student. For example, many IPiB students receive traineeships/fellowships from MBTG (Molecular Biosciences Training Grant), BTP (Biotechnology Training Program), GSTP (Genomic Sciences Training Program), CIBM (Computational and Informatics in Biology and Medicine), SciMed GRS, or NSF. We note that 6 of this year's first-year IPiB students received NSF graduate fellowships.

First-year graduate students meet with the New Student Orientation Committee (NSOC) shortly after they arrive on campus in the fall semester and are guided through the rotation procedures. Lab rotations are aimed at finding optimal matches between incoming students' research interests and IPiB faculty who share those interests. The NSOC facilitates the process of pairing students with major professors and ensures that the pairing mechanism is fair and works to everyone's best advantage. Traditionally, the final pairings are announced by the Steering Committee just before the Holiday Party, and lab groups welcome their new students as part of the collective celebration. Course work and the research-based preliminary examination are typically completed within the first two years. Of note, a committee is currently thoroughly reviewing the graduate curriculum, including a review of curricula at peer institutions. The committee will make a proposal to the IPiB Steering Committee who will then, in turn, take any changes to the faculty of both departments (Biochemistry and Biomolecular Chemistry) for approval. This committee is composed of 3 professors, 2 assistant professors, and 2 current graduate students spanning both departments.

NOTE: Teaching efforts of Biochemistry faculty can be found in Appendix 16.

IV. Staff and Infrastructure

1. Staff

A major change since the last review has been the addition of non-faculty PhD-level teaching staff. First, a retirement in 2009 permitted the hiring of a PhD-level staff person for the capstone biochemistry laboratory/seminar course for majors, Biochemistry 651. Working with course faculty, this staff member has been an essential member of the team that revamped the course content and incorporated a seminar component. Equally important has been the addition of a second PhD-level staff position with primary responsibility to assist in Biochemistry 501 (Introduction to Biochemistry). Biochemistry 501 is an important course for the campus community, serving 900-1000 students per year (~500/semester) in
many different majors, including Bacteriology, Biology, Genetics, Nutritional Sciences, Food Sciences and Animal Sciences. Enrollment in the course has more than doubled over the last decade (Figure 3). Presently this Biochemistry 501 staff position is not supported by state dollars (i.e. 101), but rather as a "buy-out" for faculty effort put forth for the Great Lakes Bioenergy Research Center (GLBRC). This position is critical to the undergraduate teaching mission of the department. The need for this type of position may well increase as the School of Medicine and Public Health continues to decrease its involvement in undergraduate education. Consequently, obtaining long-term support for this position is a major concern.

On a broader note, Biochemistry, like other departments in CALS and UW-Madison as a whole, has undergone budget cuts. The budget for non-faculty staff has been reduced by 17% in the past 3 years. This reduction has led to lay-off of staff, which we have tried to compensate for by increasing efficiency (e.g. by increased use of technologies such as job boards, intranet and a computerized purchasing system). The lack of any mechanism over the past 4 years for classified staff to receive salary increases has been very challenging. Several key staff members have recently taken other, higher paying, positions at UW and elsewhere.

2. Facilities 2012

The department's facilities represent a major strength. The research, outreach, support, and teaching programs of the Biochemistry department are housed in three separate buildings that are connected by above-grounded heated walkways. Together these buildings encompass over 485,000 gross square feet of space, with about 290,000 assignable. Upon remodeling of the top 3 floors of the 1985 wing in 2012-13, nearly all of the space in the complex will have been either constructed or thoroughly remodeled since 1998. Part of the complex is occupied and/or shared with the Biomolecular Chemistry Department of the School of Medicine and Public Health, facilitating collaborations between the departments and functional synergies. Of the total assignable space, about 14,000 square feet are devoted to administration (including offices and receiving and loading dock space), approximately 1,000 to housekeeping functions, about 40,000 to teaching functions (with 3 lecture hall/classrooms under general campus control), and the remainder devoted to research and research support functions.

The "oldest" of the three buildings is the Biochemistry Addition, at 433 Babcock Drive. Its 198,000 gross square feet house 20 research programs. Completed in 1998 as an expansion of the historic
biochemistry complex, this building is now the Biochemistry department home and houses the departmental front offices. The new Biochemical Sciences building (440 Henry Mall) includes the newly remodeled 1985 wing of Biochemistry, a new research tower, and the 1906 building formerly known as Agricultural Journalism. These disparate parts from different eras are now tightly linked to form one structure. With 210,000 gross square feet of space, the Biochemical Sciences Building houses 10 departmental research programs, the 12 research programs of the Biomolecular Chemistry department, and a variety of support functions. The third building, now simply called the Biochemistry building (420 Henry Mall), includes the old 1912 and 1937 wings of Biochemistry, all thoroughly remodeled in 2011. This building (79,000 gross square feet) has been almost entirely re-tasked to teaching functions. Bridges interconnect the three buildings, facilitating convenient access during inclement weather. The Biochemical Sciences building was largely completed by January 2012, although some remodeling of the 1985 portion of the building will not be completed until the end of 2012 or beginning of 2013. The remodeled Biochemistry building was also essentially completed in January 2012.

Major research support facilities housed in the larger complex include:
- The NMR facility at Madison (NMRFAM), one of only two high field NMR resource facilities in the nation.
- Two modern vivariums designed to house mice and rats, totaling 23,000 gross square feet (~6,000 in the Biochemistry Addition, and ~17,000 in the new Biochemical Sciences building).
- The Biophysical Instrumentation facility (BIF), housed in Biochemical Sciences.
- Numerous specialized spaces including a clean room, a single-molecule laser lab, plant growth chamber rooms, and computational space.

Modern teaching facilities, all housed in the remodeled Biochemistry building, include:
- Two large lecture halls, one seating 390 students and the other 190.
- Two smaller classrooms seating 50 and 70 students.
- New teaching laboratories to serve the programs of both the Biochemistry and Biomolecular Chemistry departments.
- A computerized classroom used by the Digital Media Center, now housed in the Biochemistry building.
- Office space to house student services.
- An undergraduate lounge that includes office space for undergraduate Biochemistry student organizations.

Administrative spaces include:
- The Biochemistry front office, housed in the Biochemistry Addition.
- The Biomolecular Chemistry front office, housed in the Biochemistry Building.
- Purchasing services, housed in the remodeled 1906 portion of Biochemical Sciences
- Student Services, housed in the Biochemistry building

The complex also includes an array of meeting spaces, with three facilities of broader significance:
- A small conference facility, capable of accommodating mini-symposia. This includes a 140 seat conference room, a 60-seat break-out room that can be divided into two rooms that each seat 30, a lobby designed for gatherings such as poster sessions. A small catering kitchen and office for conference organizers are adjacent.
- A coffeehouse in the Biochemical Sciences building, immediately adjacent to both Henry Mall and the small conference facility, in the remodeled 1906 portion of the building. In addition to providing sustenance, this facility is a major meeting place that facilitates collaboration and discussion.
- A meeting room housed in the remodeled 1906 portion of Biochemical Sciences, which can seat up to 50 people and has a small adjacent catering kitchen, is designed for faculty meetings, departmental retreats, events associated with student and faculty recruiting and other mid-sized events.
V. Outreach and the Wisconsin Idea

The department has no formal outreach program. However, a number of faculty have created and carried on such activities, particularly in the K-12 arena. Several examples are provided below.

Project Crystal (Crystallographers Researching with Young Scientists: Teaching And Learning). Professor Hazel Holden’s Project CRYSTAL’s mission is twofold: first, to instill a love for chemistry in middle school students by studying the inner workings of nutrition, thereby leading to healthy life choices; and second, to provide hands-on laboratory experience in an active, state-of-the-art research laboratory thus fostering interest in a future career in the field of science. In addition to designing and implementing chemistry modules centered on nutrition, Project CRYSTAL introduces young scientists to the world of research. On Monday afternoons 4 middle school students spend approximately 1.5 hours in the laboratory learning to conduct research. The projects chosen for these students are ideally suited for instilling the excitement of chemistry through biochemistry because they have and will continue to reveal unprecedented chemistries and to provide fundamental contributions for the design of new antibiotics and anticancer therapeutics. At the end of the program, participants will have obtained valuable tools for furthering their science educations. Details of Project CRYSTAL can be found at http://www.projectcrystal.org/. Funded by NSF.

MicroExplorers. Assistant Professor Doug Weibel co-founded an outreach program to introduce local K-12 students to optical microscopy to help them explore ‘the microworld.’ MicroExplorers is a collaborative effort that combines the expertise of a half-dozen young microscopy-oriented scientists across campus who share an interest in educational outreach (www.MicroExplorers.org). Through events at local schools and libraries, on campus, and in your home, children, parents, and families have opportunities to explore phenomena at the micro-scale. The program provides materials as a starting point for discovery-based science education for a diverse audience. They teach participants how to use microscopes to open up a new world around them, and in the process, they discover fundamental scientific principles. Participants nationwide can share their research and findings online.

POSOH (Place-based Opportunities for Sustainable Outcomes and High-hopes). POSOH or "hello" in the Menominee language) lead by Professor Richard Amasino is designed to create opportunities for learners to engage in student-led bio-energy research, from sustainability to the chemistry of carbon cycles. The goals of this USDA supported program are to: strengthen the regional K-16 education system, especially at underserved schools, by supporting teacher learning in matter, energy and ecosystem concepts using both traditional and scientific ways of understanding the natural world; develop approaches that facilitate student-led research; increase the number and diversity of students from rural and Tribal communities who can work creatively in teams and employ evidence-based approaches to problems and opportunities in bio-energy; increase the number and diversity of students from rural and Tribal communities participating in internships in industry or university summer research programs, and who ultimately enter science programs at universities; and widely disseminate the POSOH model, materials, and best practices and thus broaden our contribution to our Nation's increasing bio-energy value chain.

IBS-SROP in Biochemistry/Biophysics. The UW-Madison Integrated Biological Sciences Summer Research Program (IBS-SRP) is a 10-week program that brings 40-45 undergraduate students to UW-Madison each summer to do individual research projects, paired with faculty and graduate student mentors, Minority students and students from disadvantaged backgrounds are targeted for participation in the program, with a goal of better preparing them for admission and success in graduate school. The Biochemistry department paired with the Biophysics training program, to initiate a biochemistry/biophysics IBS-SRP subdisciplinary group in 2009. The primary goal is to create a community where students can connect with a small group of peers (5-10 students) and practicing scientists who are doing similar research in the areas of biochemistry and biophysics.
2. Alumni
We mainly keep in touch with our alumni through our Newsletter. The two most recent newsletters can be found in Appendix 17.

VI. Leadership and Governance
1. Recent leadership changes and impact
The department has had 8 department chairs since its inception in 1883. They have served long terms ranging in length from 5 to 30 years. The previous chair, Hector DeLuca, served for 30 years, until 2005. A discussion among the faculty in 2005 led to the consensus that substantial lengths of terms, 4-5 years with a possibility of renewals, are advantageous to the department for reasons of continuity, but that very long terms are not in the best interest of the department. Elizabeth Craig became chair in 2005.

<table>
<thead>
<tr>
<th>Chair Name</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henry P. Armsby</td>
<td>1883-1888</td>
</tr>
<tr>
<td>Stephen M. Babcock</td>
<td>1888-1906</td>
</tr>
<tr>
<td>Edwin B. Hart</td>
<td>1906-1944</td>
</tr>
<tr>
<td>Conrad A. Elvehjem</td>
<td>1944-1958</td>
</tr>
<tr>
<td>Hector F. DeLuca</td>
<td>1970-1986</td>
</tr>
<tr>
<td>Hector F. DeLuca</td>
<td>1991-2005</td>
</tr>
<tr>
<td>Elizabeth A. Craig</td>
<td>2005-present</td>
</tr>
</tbody>
</table>

In recent years the department has had two vice-chairs, one focusing on undergraduate teaching and the other on research space issues. The choice of vice-chairs is solely up to the chair. The vice-chairs also act for the chair in instances where the chair is away or has scheduling conflicts, or has a conflict of interest. (For example, the associate chair would chair the executive committee when the annual review of the chair occurs.) In practice, the vice-chairs, particularly as part of the Chair’s Advisory committee, also serve as advisors to the chair. Discussions occur when policy or decisions are being crafted, prior to debate and discussion by entire faculty or other administrative body. In addition, the vice-chair may assist the chair in dealing with administrative tasks, reports, etc. The vice-chairs also have signing authority for official documents. Presently the vice-chairs are Richard Amasino and Michael Cox, focusing on teaching and facilities, respectively.

2. Program governance model
With respect to its general administrative structure and procedures, the Biochemistry Department adheres, of course, to the fundamental rules applying to all departments as given in the “Faculty Policies and Procedures” (FP&P) document of the University of Wisconsin-Madison. Chapter 5 of that document deals with departmental faculties and defines the fundamental principles of departmental governance, e.g., selection and duties of the chair, the composition and role of executive committees, and the responsibilities and functions of the general departmental faculty. It provides, in particular, that: "The immediate governance of the department is vested in its departmental faculty... which has jurisdiction over all the interests of the department, including authority to determine all departmental questions that are not vested in the departmental executive committee..." Within the Biochemistry Department, the spirit of this rule is implemented in the sense that all substantive issues (excluding matters relating to tenure and promotion) are brought to, are discussed by, and are decided by the vote of, the whole departmental faculty - i.e., the professors of all ranks on active status. The authority for making decisions on tenure matters (promotion from assistant to associate professor) is specifically vested in the departmental executive committee (consisting of all associate and full professors), and the authority to make recommendations on promotions to full professor has been delegated by the executive committee to the full professors of the department. All members of the faculty, however, participate in decisions on new hires regardless of the rank of the position to be filled.

The department's chair is appointed by the Dean for a one-year (but renewable) term, after taking into account, and usually in accord with, the results of a secret preference ballot solicited annually from the
faculty. In preparation for this ballot the faculty meets (in the absence of the chair) for a general discussion of the department’s condition and the chair’s performance. The chief mechanisms for faculty participation in department governance are regularly convened faculty meetings and the departmental committees. The former are scheduled by the chair at varying intervals as demanded by the business at hand. Meeting agendas (prepared by the chair based on requests from committees or from individual faculty members) typically include not only matters requiring formal legislative action, but also subjects of professional interest to the faculty that merit general discussion.

The faculty’s broad involvement in departmental governance is perhaps most clearly demonstrated by the department’s quite comprehensive committee structure. An appropriate faculty committee supports all critical academic or administrative departmental functions. The committee structure of the department is listed below (with the current membership and charges in Appendix 18).

**Standing department committees:**
- Animal Care Committee
- Apparatus Committee
- Art Committee
- Awards Committee
- Biophysics Instrumentation Committee
- Chair’s Advisory and Long-Range Planning Committee
- Computer/Media Lab/Website Committee
- International Committee
- Newsletter Committee
- Non-Faculty Academic Staff and Fellowships Committee
- NMR Instrumentation Committee
- Postdoctoral Training Committee
- Safety Committee
- Seminar and Symposium Committee
- Undergraduate Committee

**IPiB committees:**
- Steering Committee
- Admissions and Recruiting Committee
- New Student Orientation Committee
- Examination and Certification Committee
- Student-Faculty Liaison Committee
- Graduate Teaching Assignment Committee
- Curriculum Review Committee

**Ad Hoc committees:**
- Future of NMR Committee
- Future of Biophysics Facility (BIF)
- Tenure Advisory Committee for Douglas Weibel
- Tenure Advisory Committee for Alessandro Senes
- Tenure Advisory Committee for David Pagliarini
- Tenure Advisory Committee for Aaron Hoskins
- Tenure Advisory Committee for Jill Wildonger

In general, all matters to be considered by the faculty are first reviewed by the relevant committee, and subsequent faculty action is based on the committee’s report and recommendation. All committees serve in an advisory capacity to the chair and to the faculty, and while some (e.g. Media/IT Committee) obviously have the authority to make decisions within their sphere of competence, all questions of policy
or significant changes in procedure must be brought to the entire faculty. The appended committee list also shows that oversight over certain departmental functions (e.g., Biophysics Instrumentation Facility) has been delegated to a single faculty member (“officer-in-charge”) rather than a full committee, based on the rationale that the efficient operation of these general support facilities calls for continuing, well-informed, and fast-responding managerial input rather than deliberative advice. The “officer-in-charge” is empowered to make routine administrative dispositions within his or her area of authority, but, as always, matters of policy or major departures from established practice require faculty approval. Specific committee (or “officer”) assignments are made by the chair, based on the principle of achieving a reasonably equitable distribution of committee duties, while also considering such factors as a faculty member’s indicated interests and preferences, special expertise, and the need for appropriate turn-over in committee membership.

Promotion and tenure decisions are the prerogative of the departmental executive committee. The department has in place an established set of policies and procedures for guiding tenure candidates through their probationary period, for reviewing their progress, and for arriving at a final promotion decision. For each assistant professor a special ad hoc tenure committee (generally consisting of 4 tenured professors) is established at the start of his/her probationary period. In addition, the tenure candidate has the assistance of a faculty mentor who acts as an informal advisor/consultant and is an ad hoc member of the tenure committee. The tenure committee monitors and reviews the candidate’s progress and presents an annual report to the departmental executive committee that provides an assessment of the candidate’s performance and prospects; after approval by the executive committee, the report is also made available to the candidate. Whenever appropriate (or necessary) this annual evaluation process culminates in a decision on promotion based on a final two-stage review: an initial comprehensive evaluation of the candidate’s credentials by the executive committee which, if favorable, leads to the solicitation of reference letters, followed by a second executive committee review leading to a final tenure decision by written ballot. A favorable decision requires a 2/3 majority of the votes cast. The faculty’s action is communicated with full documentation as a recommendation to the Dean, who, in turn, solicits the advice of the appropriate University-wide divisional executive committee (i.e., Physical Sciences, or Biological Sciences) before taking final action. Only the department’s full professors vote on promotions from associate to full professor. The procedure is analogous to the two-stage review procedure (without, of course, the preceding annual monitoring process). A favorable recommendation, which also requires a 2/3 majority of the votes cast, is communicated to the Dean for final approval and action.

Post-tenure review of all tenured professors is carried out at regular intervals as required by the UW Board of Regents. An important part of this review is a statement by the faculty member of their future directions. The department’s procedure can be found in Appendix 19.

VII. Budget and Funding
The two major issues currently faced by the department are (a) the hiring of new faculty to address the age demographics of the department and (b) maintaining a group of talented support staff.

The faculty hiring issue is critical. Hiring strong young faculty will be much more difficult without the presence of a strong base of working senior faculty. We believe that once that strength is lost, hiring the strongest young faculty will become much more difficult. Even now there is a dearth of recently established associate and newly promoted full professors. We believe that strategic hiring of young, as well as a few seasoned investigators, is important for rejuvenation of the department.

As with other units within the college and university, a shrinking departmental budget is having an impact on operations. To accomplish the budget reductions with minimal damage to our teaching and research missions, the department has carried out a reorganization plan placing emphasis on streamlining procedures, prioritizing activities and taking advantage of WEB-based systems. For example, we have created a WEB-based purchasing system, which integrates information from the time a purchase is initiated to scanning an electronic filing of packing slips upon receipt. In addition, we have set up an
intranet, which includes information ranging from room scheduling to the location of the dry ice supply. Although these changes have created efficiencies, sustaining support of the operation of the department is very challenging. Perhaps the most difficult issue for staffing of the department has been the lack of any mechanism to provide raises for classified staff over the past 4 years, regardless of how stellar their work. This lack of flexibility, exacerbated by the effective pay decrease due to furloughs, followed by benefit reductions, has not only led to poor morale but a culture of “job hopping” as a means of gaining pay increases. Hopefully the new personnel/HR system that is in the process of development by the university will ameliorate this problem.
Appendix 1

10-Year Graduate Program Review

Departments of Biochemistry & Biomolecular Chemistry

2012
# Table of Contents

1. Preface.................................................................................................................................iii

2. Background/Quality of the Program and Faculty.................................................................1
   Origin of IPiB.........................................................................................................................1
   Focus of the Program (Mission & Goals) .............................................................................1
   National Reputation ............................................................................................................1
   Program Breadth ...................................................................................................................2
   Faculty Accomplishments ....................................................................................................2
   Curricular Changes .............................................................................................................2

3. Recruitment.........................................................................................................................3
   Recruiting and Admissions .................................................................................................3
   Recruitment of Underrepresented Minorities & Program Diversity ......................................4
   Background Course Requirements .......................................................................................4
   Student Quality ....................................................................................................................5

4. Funding...............................................................................................................................5

5. Advising/Degree Committees............................................................................................5
   IPiB Thesis Advisors ..........................................................................................................5
   Rotations ................................................................................................................................6
   Thesis Lab Assignments .......................................................................................................6
   Thesis Committee ...............................................................................................................7
   Thesis Lab Changes ............................................................................................................7
   Committee Member Changes .............................................................................................8
   Yearly Committee Meetings ...............................................................................................8
   Final Thesis Defense ..........................................................................................................9

6. Satisfactory Progress Guidelines .......................................................................................9

7. Professional Development Opportunities for Graduate Students.................................10
   Professional Meeting Participation ....................................................................................10
   Responsible Conduct of Research .......................................................................................10
   Careers ...............................................................................................................................11
   Teaching .............................................................................................................................11

8. Program Climate................................................................................................................11
   Facilities & Activities .........................................................................................................11
   Governance and Administration ........................................................................................12
   Collaborations .....................................................................................................................12
   Grievances & Appeals .........................................................................................................12

9. Program Information Accessibility ....................................................................................13
   Student Services ..................................................................................................................13
   Program Website .................................................................................................................14
   Courses ................................................................................................................................14
   Timeline ................................................................................................................................14

10. Assessment of Graduate Student Learning Outcomes.....................................................14
This self study was organized in accordance with the guidelines provided on the Graduate School website as of January 19, 2012:
http://www.grad.wisc.edu/education/academicprograms/tenyearquestions.html

The IPiB Handbook is included in its entirety in Appendix A. The handbook outlines many features and details of the Program.

Specific questions asked by the School of Medicine and Public Health are contained within the document. For a listing of School of Medicine and Public Health questions and a listing of the location of the answers, see Appendix R.
BACKGROUND/QUALITY OF PROGRAM & FACULTY

How did the program begin? Has its focus changed since the last review? How is the department viewed nationally? What is the breadth of expertise of faculty in the program? What are marks of faculty accomplishment? What curricular changes have been instituted in the graduate program, and for what reasons?

Origin of IPiB

The Biochemistry Department in the College of Agricultural and Life Sciences and the Biomolecular Chemistry Department in the School of Medicine and Public Health first established doctoral graduate programs in the 1880's and 1920's, respectively. At that time, the formation of independent graduate programs in the two schools/colleges satisfied the need for specialized training in plant and animal biochemistry in CALS and human biochemistry in the Medical School. However, in the ensuing decades, an understanding of the fundamental similarities of biochemical processes in cells of all life forms has blurred the boundaries between the research carried out by students in the two graduate programs.

Thus, in 2006, the Departments of Biomolecular Chemistry and Biochemistry crafted a plan for a joint graduate program in Biochemistry, capitalizing on the strong history of graduate training in both departments. The program represents the best features of each of the departmental programs and highlights an exciting and unprecedented step for cooperation and collaboration in the biochemical sciences at the University of Wisconsin-Madison.

The Integrated Program in Biochemistry (IPiB) offers a PhD in Biochemistry and a terminal MS in Biochemistry (non-admitting program).

Focus of the Program (Mission and Goals)

• To prepare students for teaching and research in academic positions, for research in government service, and for research and development work in industry
• To create a preeminent doctoral program in biochemistry with broad opportunities for research training
• To offer a coordinated and high quality program of coursework in biochemistry
• To promote cross-fertilization across departmental and college/school boundaries amongst faculty and students
• To vigorously recruit outstanding graduate students nationally and internationally

National Reputation

Since the origin of the program, Biochemistry at UW-Madison has consistently been ranked in the top tier of biochemistry graduate programs. However, biochemistry program rankings have limitations due to the very wide breadth of the discipline – spanning biology, chemistry, and physics.

• The U.S. New & World Report annual educational ranking has placed UW-Madison as one of the top 5 Biochemistry graduate programs. (http://grad-schools.usnews.rankingsandreviews.com/best-graduate-schools/top-chemistry-schools/biochemistry-rankings for the 2010 rankings)
Phds.org has placed UW-Madison as one of the top 10 (8) larger Biochemistry graduate programs. (http://graduate-school.phds.org/rankings/biochemistry/rank/larger)

Program Breadth
The IPiB program provides research opportunities in 49 (36 in Biochemistry & 13 in Biomolecular Chemistry) laboratories whose research spans the full range of contemporary topics in biochemical, chemical, and molecular sciences. Currently, IPiB has 113 (Appendix G) graduate students conducting research in its laboratories. Most of the IPiB laboratories also have students from other training programs including Cell & Molecular Biology, Microbiology, Genetics, Chemistry, Biotechnology, Biophysics, and Neurosciences. The UW campus has a strong tradition of interdisciplinary and interdepartmental graduate training programs. Interaction and collaboration with students, faculty, and staff of other programs and departments are widespread, which represents a key feature for broad training on the UW campus.

The combined faculty of IPiB consists of world-leading researchers who have made important contributions to unlocking the secrets of plant flowering; protein structure, function and folding; membrane trafficking and transport; vitamin and hormone/growth factor action and signal transduction mechanisms; lipid synthesis and metabolism; RNA splicing, transport and degradation; DNA replication, recombination and transcription; cell division, differentiation and death; viral replication and transcription; animal and plant development and physiology (Appendix I).

Faculty Accomplishments
The quality of the faculty is reflected by the faculty CVs (Appendix K) and faculty awards (Appendix J).

Curricular Changes
A committee is currently thoroughly reviewing the graduate curriculum. The committee is reviewing the components of the current program courses and comparing this information to the curricula at peer institutions. The committee will make a proposal to the IPiB Steering Committee who will then, in turn, take any changes to the faculty of both departments for approval. This committee is composed of 3 professors, 2 assistant professors, and 2 current graduate students spanning both departments.

The present course requirements are (syllabi provided in Appendix N)

- Biochem 660 – Biochemical Techniques (2 credits)
  - This course is focused on understanding biochemical methods and is taught by individuals utilizing a wide range of methods in their research.
- Biochem/BMC 701 – Professional Responsibility (1 credit)
  - This course is focused on training for the practical aspects of being a scientist. The course covers ethics, peer review, grant writing, science communication, career alternatives, paper writing, experimental design, research documentation, science funding, academic-private interface, scientific fraud, and more.
- Biochem/BMC 710 – Exploring Biochemical Functions of Macromolecules (2 credits)
This course is a survey of concepts and approaches in contemporary biochemical research. Teams of faculty members focus on research problems utilizing interdisciplinary approaches. Focus topics include protein structure, enzyme catalysis, gene transcription, RNA structure and function, metabolism and regulation, biology of the cell cycle and development, membrane structure and function, virus life cycles, and the immune system.

- Electives totaling 6 credits
  - Physical Science elective (2 credits minimum)
  - Biological Science elective (2 credits minimum)
- Continuous enrollment in an advanced seminar
  - After completing one semester of graduate work, students register for an advanced Biochemistry, Biomolecular Chemistry, or other approved seminar course each fall and spring semester of each academic year.
  - During their graduate careers, students are required to present a minimum of 3 seminars in advanced seminar courses and receive a grade of B or better in each seminar.
    - One literature seminar is in the general area of their research interests.
    - One literature seminar is in an area outside their specific research interests.
    - One seminar is presented on their research progress in an interdepartmental graduate seminar. This generally occurs in the fourth or fifth year of graduate study. Students are required to enroll for two semesters in this seminar series, even though they are expected to present a seminar only once.
- Any additional courses required by the student’s thesis committee
- A minor is required as part of the program for breadth
- Section 4.2 of the IPiB Handbook outlines a typical breakdown of a student’s academic progress (Appendix A).

**RECRUITMENT**

What effort has the department/program made to enhance diversity and have those efforts been successful? How do you know? For instance, what are the characteristics of the applicant pool, and how diverse is the student population? What is the quality of the graduate applicants, as indicated by GPA, GRE, competitive awards, and other measures appropriate to the field? What are the admissions criteria and procedures? What percentage of students are on probation? How many applicants are admitted? Enrolled?

**Recruiting and Admissions**

An Admissions Committee consisting of members of the two departments review applications and make admission decisions. In the past three years, the program has received an average of 283 applications and has brought in an average of 50 students for interviews, accepted an average of 45 of those interviewed, and has enrolled an average of 25 students (56% of those accepted). The class size varies from year to year based upon funding resources and lab space.
availability. The faculty are polled each year to determine the space and funding availability before offers are made to applicants.

Appendix D contains the Request for Biological Sciences Graduate Student Support Funds from the previous year. Appendix C contains the Graduate School Graduate Program Profile. These documents contain detailed recruiting and admissions information and data including GPA and GRE scores.

Recruitment of Underrepresented Minorities & Program Diversity
IPiB places an emphasis on recruiting and retaining a diverse population of students. Currently, there are 60 male and 53 female students enrolled in the program. Over the last 5 years, the program has admitted 11 underrepresented minority students (average of 2.2/year; ~10% of incoming class).

IPiB along with CMB, Neuroscience, Microbiology, Genetics, and Environmental Toxicology sponsor a preview weekend (prior to regular recruiting weekends) for prospective students who are from targeted underrepresented minority groups and have demonstrated interest, ability, and potential for success in a PhD research program.

In addition, the program is advertised by sending representatives to various graduate student recruiting fairs including the Society for Advancement of Chicanos and Native Americans in Science (SACNAS) and the Annual Biomedical Research Conference for Minority Students (ABRCMS). The program also sends mailings to 27 Historically Black Colleges and Universities (HBCU) and 103 Hispanic Universities.

Due to focused recruiting efforts over the last three years, the percentage of minority applicants has increased from 2% to 11% of the applicant pool. During this same time period, the percentage of the incoming class composed of minority students has increased from <1% to 18%.

To further diversify the program internationally, we have initiated new ways to evaluate international applications we receive each year. IPiB has used the China-US Biochemistry Admissions (CUSBA) service for six years to evaluate quality applicants from China. One CUSBA student joined us last fall. We also use the Khorana Summer Research Scholars program as a pipeline for Indian students into IPiB. We had one previous Khorana scholar join us last fall.

Background Course Requirements
Candidates should have an undergraduate degree in biochemistry, chemistry, physics, or one of the biological or medical sciences. A minimum GPA of 3.0 (on a 4.0 scale) is required. In addition to meeting the general requirements of the UW-Madison Graduate School, at least 3 semester credits (or the equivalent) of course work in each of the following subjects is required: organic chemistry, biochemistry, physics, and physical chemistry. Any course deficiencies in these subjects must be made up during the first 2 years of graduate study. In addition, prior course work in mathematics, biology, and genetics is strongly recommended.
Student Quality
Each year, IPiB has a strong applicant pool with a large number of applicants. Because the quality of the applicant pool is so high, IPiB sets the admissions standards very high. Currently, only 23% of applicants are accepted with an overall GPA over the last 5 years of 3.7. The average GRE percentiles during that same time period were Verbal 77%; Quantitative 79%; and Analytical 60%.

Incoming students are also very competitive for many fellowships and traineeships including NSF Graduate Fellowships, Molecular Biosciences Training Grant (MBTG), Biotechnology Training Program (BTP), Genomic Sciences Training Program (GSTP), Computation and Informatics in Biology and Medicine (CIBM), Chemistry/Biology Interface Fellowships (CBIT), and SciMed GRS Fellowships.

In addition to their academic achievements, many of our students enter the program with peer reviewed publications and awards (see Appendix D Table 2).

FUNDING

How are graduate students supported by the department (fellowships, TA’s, PA’s RA’s, traineeships, etc.)? What percentage are funded? How are those funding decisions made? What are the sources of this funding?

All students who maintain satisfactory progress and maintain continuous enrollment are funded throughout the duration of their graduate studies. The current stipend rate is $24,000. Students also receive tuition remission and fringe benefits (e.g. health insurance, life insurance). The funding is derived from grants to the major professor or from awards made to the student. Many IPiB students receive traineeships/fellowships from MBTG (Molecular Biosciences Training Grant), BTP (Biotechnology Training Program), GSTP (Genomic Sciences Training Program), CIBM (Computational and Informatics in Biology and Medicine), SciMed GRS, or NSF. (See Table 4 of Appendix D and Appendix G for current funding information.)

ADVISING/DEGREE COMMITTEES

How are advisers assigned? At what stage? What process do students employ to change advisers? How many advisees does each faculty member have? How often do students meet with advisers? Do students receive written feedback on their academic progress? How do students choose their degree committees? Are there written guidelines for the reading of theses and dissertations and the scheduling of defenses?

IPiB Thesis Advisors
Thesis advisors are tenure track faculty members of either the Department of Biochemistry or the Department of Biomolecular Chemistry. New faculty members in either of these departments automatically become a member of IPiB. Faculty members in other departments can apply to become trainers (Appendix L). Applications to be a trainer in the program are
evaluated by the faculty of both departments and require a two-thirds vote by the combined Biochemistry/Biomolecular Chemistry faculty for approval. Trainers appointed to the program are reviewed for reappointment every four years. At the present time, IPiB has no trainers.

**Rotations**

Lab rotations are aimed at finding optimal matches between incoming students' research interests and Program faculty who shares those interests. The New Student Orientation Committee (NSOC) facilitates the process of pairing students with major professors and ensures the pairing mechanism is fair and works to everyone's best advantage. Students meet with the NSOC shortly after they arrive and are guided through the rotation procedures (outlined below).

Orientation week occurs the week prior to classes starting in the fall semester. All incoming students are required to attend the weeklong orientation. During orientation, students are familiarized with the requirements of the Program and the Graduate School. Also, IPiB faculty have the opportunity to meet incoming students and describe their research programs in a series of 15-20 minute "short talks" during orientation. During this week, students also schedule time to meet with faculty one-on-one. Personal discussions about research opportunities, space, and funding are highly encouraged before a student submits his/her first rotation choices (at the end of this first week).

- **Rotations**: The 1st semester of a new student's program is divided into 3 rotation periods of 5 weeks each. During each rotation, the student reports to an assigned lab and participates as a member of that research unit. Occasionally, the NSOC also permits a 4th rotation (Dec-Jan) if required for a favorable pairing. However, three rotations are generally sufficient and provide a quick launch to every student's research career, which is a major aim of the process.

- **Rotation Assignments**: Each year, the NSOC compiles a current list of Program faculty members who have lab space and funding for new students. The list is distributed during Program orientation. New students are then asked for an initial list of 3-4 faculty members with whom they might like to rotate. The NSOC will balance these requests against each lab's consideration for space/funding, and in consultation with the rotation faculty, assign a match list for the first rotation. The process is repeated for the 2nd and 3rd rotations. The NSOC is very experienced in pairing students with compatible opportunities. If a student repeatedly requests a particular assignment, the NSOC will facilitate that match as soon as rotation space allows.

- **Student Responsibilities**: IPiB students are encouraged to participate in rotations that expose them to a variety of fields, research methodologies, and laboratory cultures. Each rotation is a serious undertaking, requiring significant student initiative and responsibility.

**Thesis Lab Assignments**

Near the end of the 3rd rotation, students are asked by the NSOC for a ranked list of preferred thesis advisor selections. The listed faculty members are then asked whether they might accept one or more of these students into their groups. The matching process tries to optimize student/faculty choices with attention to the funding and space in each lab.
Traditionally, the final pairings are announced by the Steering Committee just before the Holiday Party, and lab groups welcome their new students as part of the collective celebration.

Newly assigned students report to their major professors the Monday following announcement of the final pairings for guidance in registering for the spring semester, lab space assignments, and other orientation procedures. Students begin working in their new lab immediately.

**Thesis Committee**
Every graduate student must have a faculty advisor (major professor) who is on the IPiB faculty. The major professor advises the student about course work, supervises the student's research, and acts as a channel of communication within the department, to other departments, and to the Graduate School. The major professor must approve the student's coursework and research direction before registration and must also approve any subsequent changes to it.

A graduate committee is composed of at least 5 current graduate UW-Madison faculty members, including the major professor. The committee is empowered by the Program to advise the student about certification, administer the preliminary examination, oversee yearly progress reports, approve thesis composition, and conduct the final PhD examination. Before the third semester of graduate study, the student, in consultation with their major professor, selects four members of the UW-Madison faculty to serve on the student's graduate committee. The Graduate School requires at least one of these members to be from outside the Program, and the IPiB Program permits no more than two members to be from outside the Departments. Students choosing Minor Option A typically include the minor professor among their selected faculty. It is the student's responsibility to seek and obtain (verbal) approval from their four selected faculty to serve on this committee. The Examination and Certification Committee (ECC) approves the committee composition. The ECC designates which committee member from the Program serves as Chair for the preliminary exam. The major professor chairs all other committee meetings.

**Thesis Lab Changes**
If a student decides that their current laboratory assignment is not suited to their long-term interests they contact the Graduate Program Coordinator or the Chair of the Steering Committee for guidance. If the issues in the current laboratory cannot be resolved, an effort is made to reassign the student to a new advisor. Typically, to facilitate the student finding a new lab, the Chair of the Steering Committee contacts professors within IPiB who have expressed an interest in accepting a new student and whose research interests are consistent with those of the student. The Chair of the Steering Committee also discusses the matter with the current advisor. Thereafter, the student participates in a one month rotation to discover if the new laboratory and advisor are acceptable to both parties (additional rotations might be required to find an appropriate match). If a change in laboratory occurs prior to the Preliminary Examination, that examination is postponed for no more than one year. This allows for generation of sufficient preliminary data in the new laboratory to support a written research proposal and oral examination.
Committee Member Changes
Typically, a graduate committee is appointed for the duration of a student's degree Program. Temporary or permanent committee changes are considered by the ECC if a written request, signed by the major professor and the student, is submitted to the Program office. Any requested changes to the committee makeup require prior (verbal) approval from the substitute member.

Yearly Committee Meetings
First Review Meeting: The graduate committee is convened prior to the beginning of the second year to evaluate the student's performance in course work and to discuss his/her research project. The major professor and at least 2 of the 4 committee members must be present. In the event a faculty member should miss this meeting, the student must contact him/her within one week, for an individual reprise of the meeting content and to obtain the requisite signatures. The goal of the first meeting is to introduce the student's research area and outline goals. The second meeting, the upcoming prelim, is the proper forum to discuss the route to the goals. One week before the first meeting, the student prepares a brief outline of their proposed research directions and distributes it to their committee. The outcome of the meeting should be a completed First Committee Meeting Evaluation Form signed by all 5 faculty members. The student receives a copy of this evaluation, and a copy is retained in the Program Office. A copy of this form can be found in Appendix 10.G of the IPiB Handbook (Appendix A).

Preliminary Exam: Preliminary or qualifying examinations are a standard feature of PhD Programs. The process serves to evaluate whether a student meets the expected professional standards for educational acumen, scientific background, aptitude for research, and literary competency. The process focuses attention on a candidate's proposed research and provides a realistic appraisal on the likelihood of Program completion. IPiB students are expected to complete the preliminary exam process before the end of their 4th semester in residence. Exceptions to the typical exam schedule require ECC approval. (See IPiB Handbook section 3.8.2 for full details regarding the preliminary exam in Appendix A.)

Yearly Review Procedures: Every year following the prelim, students are required to give a report on their research progress and future plans to their graduate committee. The meeting must take place no later than May 31 of each academic year. A 2-3 page summary of aims accomplished and future plans should be distributed to the committee no less than 2 days before the meeting. After a brief oral presentation, the student and committee (the major advisor and at least two committee members must be present) discuss the progress made, future plans, and complete an evaluation form summarizing the progress to date and future plans. The evaluation form is returned to the Program Office and becomes part of the student's file. A copy of this form can be found in Appendix 10.H of the IPiB Handbook (Appendix A).

The purpose of yearly meetings is to provide guidance and encouragement so the student can complete their PhD research in a timely manner. If at any point the graduate committee believes sufficient progress is not being made, or is unlikely to be made, they may recommend dismissal from the Program.
Final Thesis Defense
Students are expected to carry out significant, original research during the entire period of their PhD training and to write a thesis based on this research. The thesis must be formatted according to the guidelines of the Graduate School, present evidence of a substantial experimental effort by the student, and reflect a strong intellectual contribution that meets all standards set by the student's graduate committee. If the work is the result of collaborative enterprises, the writing must clearly define those portions representing the student's own contribution. The thesis must also include a substantive review of literature relevant to the project. It should be written with a high level of literary skill, such as would be found in leading journals in that research area.

The thesis must be completed and distributed to the members of a student's graduate committee not less than two weeks before the date of the final oral examination. Publication of a PhD thesis is required, since it constitutes a permanent record of research and literary achievement.

The final oral examination deals primarily with the thesis content. A student takes the final exam only after all other degree requirements have been satisfied, including clearing his/her academic record of incomplete grades and progress grades (other than research credits). Within IPiB, students traditionally begin their oral exam with a public seminar summarizing their research accomplishments and highlighting the significance to the field. The seminar is not graded. Afterwards, the student meets with his/her graduate committee and responds to questions. The major professor can take part in the questioning but should not actively steer the discussion or defend the research. The oral examination usually lasts up to 2 hours (not including the public seminar) or until the committee is satisfied with their individual evaluations. The student is then excused, and after deliberation, the members decide whether or not to endorse the degree completion by signing the PhD Warrant.

To pass the final examination, a student must receive no more than one dissenting vote from the graduate committee. A missing signature on the Warrant is considered a dissent. At the discretion of the student's graduate committee, a student may repeat a failed final exam (once), be dropped from the Program, or leave the Program with an MS degree.

Satisfactory Progress Guidelines

How is satisfactory progress determined? Does actual practice coincide with published criteria? (The criteria for each program can be found in the Graduate School Catalog.) How do department criteria compare to those in similar programs?

Success in the PhD program is determined by adequate progress in both coursework and research. The coursework is determined by Program requirements as well as by the student's committee. In many instances, the committee will suggest additional courses that aim to help the student's research work. Students must maintain a cumulative grade point average of 3.0. Any grade of C or lower in an IPiB course requirement requires repeating the course.
The major professor determines satisfactory progress in the lab. This evaluation includes but is not limited to working regular hours in the lab as set by the major professor, participating in lab related activities, and keeping laboratory notebooks. If a student is not making satisfactory progress, the advisor will consult with the student’s committee and the student may be dismissed from the Program. Currently, there are no students in the program on probation.

The IPiB Handbook was developed for the purpose of providing the students and the faculty with written expectations of the program. The handbook essentially walks the students through each stage of their graduate career.

The satisfactory progress criteria is in agreement with what is published in the Graduate School Catalog (Appendix E) and is in agreement with the generally accepted practices of other science graduate programs on the UW campus.

**PROFESSIONAL DEVELOPMENT OPPORTUNITIES FOR STUDENTS**

Are there opportunities and funding available for graduate students to attend and present at professional meetings? Does the department/program provide/require education in the responsible conduct of research to its students, faculty, and staff (e.g., data management, mentor/trainee relationships, publication practices, peer review, collaborative science issues, human subjects, research involving animals, research misconduct, conflict of interest)? Are there resources and guidance for exploring academic and non-academic careers? Does the program have flexibility that allows students to experience teaching opportunities that advance their careers?

**Professional Meeting Participation**

Presenting at professional meetings is an important part of graduate training. This experience also allows the students to build a network of colleagues with similar research interest. Grants to the thesis advisor typically provide funds to support student travel. IPiB students are also competitive for Vilas Travel awards and departmental funding for this purpose. Both departments highly encourage and actively provide funds to encourage travel to professional meetings.

**Responsible Conduct of Research**

All IPiB students are required to participate in Biochem 701 (Professional Responsibility; Appendix N.2) during their first semester of graduate training. This course covers the practical aspects of being a scientist (e.g. ethics, peer review, grant writing, science communication, career alternatives, paper writing, experimental design, research documentation, science funding, academic-private interface, scientific fraud).

The IPiB Handbook addresses misconduct as well in section 9.4. The University is bound ethically and legally to respond to allegations of scientific misconduct in a fair, objective and timely manner. It has established a policy for dealing with allegations of misconduct in scholarly research as described in (Faculty Policy II-314). Graduate students and research associates should report wrongdoing or misconduct to their faculty supervisor, or if necessary, the department Chair. In cases where the Chair is the target or is conflicted, witness should contact the Associate Dean for Research of their respective
college or school. Faculty supervisors should discuss the situation with department Chairs, who in turn should to discuss the situation with the appropriate School/College Associate Dean for Research. At any time in this process, and particularly if a witness does not believe that due attention has been given to a written report of wrongdoing, the Associate Dean for Research may be consulted and will serve as the college’s main point of contact in such matters. (Please visit http://grad.wisc.edu/research/policyrp/researchmisconduct.html for more information.)

Careers
IPiB Students participate in a one-day symposium held every other year called Life Sciences Careers Day to introduce PhD students to the wide range of careers that are available to students who obtain PhD degrees in the biological sciences. IPiB students are also informed about programs supported by the Delta Program. In addition, the Program Office keeps students informed of career opportunities in both industry and academia.

Teaching
Program candidates for the PhD degree participate in 2 semesters of teaching as part of their training and professional development. The goal of the teaching assignments is to accommodate the needs and desires of the students. Teaching consists of assisting in an assigned departmental laboratory or lecture course. This is usually done in the second and third years of graduate school. In addition to the required teaching component, opportunities arise for students to take part in additional voluntary teaching assignments.

Program Climate

Is there a climate of an institutional home (community) within the program? Does the program routinely survey its student population and its alumni? Is there a space for meeting? Is there a graduate student organization in the department/program? Are students aware of grievance procedures? Are there formal and informal opportunities for faculty/staff/student interaction? Does the program offer graduate students opportunities to participate on program governance committees? Is there active engagement of enough faculty to build/maintain the governance and administration of the program? Are students encouraged to collaborate with students and faculty in other programs? Are there joint activities with other programs and communities beyond the university?

Facilities & Activities
Because the program only spans two departments, students interact with each other regularly and maintain a close association. This closeness has increased with the opening of the renovated Biochemistry Building and the opening of the Biochemical Sciences Building (opened 12/2011). Almost all faculty from Biochemistry and Biomolecular Chemistry are housed together in one complex. This is an exciting advance for the program and will greatly increase interactions and collaborations. Among the complex of buildings, there are over 24 meeting rooms with one room set-aside specifically as a graduate student meeting room. In addition to formal meeting space, the facilities include many break rooms and open areas for relaxation, discussions, and interactions.
In addition to proximity, many activities occur throughout the year to enhance interaction among students and faculty within the program. Some of these activities include a retreat, holiday party, art show, Halloween party, poster session, and welcome picnic. Recruiting activities each spring bring faculty and students together for a joint mission to recruit the next class of Biochemistry students.

All incoming graduate students are required to participate in Orientation Week where they spend the week together and hear talks from the Program faculty. The New Student Orientation Committee holds one additional meeting with all of the new students during the first semester. New students also participate together during the first semester in Biochem 660 and Biochem 701. Orientation and these courses provide opportunities for the first year students to spend much time together during the first semester and to build a bond with one another.

**Governance & Administration**

Graduate students participate in the Student/Faculty Liaison Committee where they plan activities and events for the program. This committee also provides the students with a forum by which they can bring concerns to the faculty. In addition to this committee, every IPiB committee has a student representative on the committee (including the IPiB Steering Committee). A full list of IPiB committees and duties can be found in Appendix F. Students are also surveyed for input on various Program issues (feedback on curriculum, structure of retreat, etc.).

**Collaborations**

Labs in IPiB attract students from many programs across campus. This allows students in the program to interact directly in their labs with students in programs such as CMB, Microbiology, Nutritional Sciences, Genetics, Chemistry, etc. In addition, students are required to have at least 1 faculty member from outside the program on their thesis committee. This provides an avenue for students to interact with faculty members across campus and gain valuable insight from a different perspective. Students also interact with the greater UW community through the Biological Sciences Picnic held each fall and the many symposia held on the UW campus throughout the year.

**Grievances & Appeals** (adapted from the Graduate School Academic Policies and Procedures)

The Grievance and Appeals policy is part of the IPiB handbook and every student gets a copy of this document during orientation week. The handbook is also readily available on the IPiB website. Information on misconduct is also covered in a section of Biochemistry 701 (required core course during first semester).

If a student feels unfairly treated or aggrieved by faculty, staff, or another student, the University offers several avenues to resolve the grievance. A student’s concern about unfair treatment is best handled directly with the person responsible for the objectionable action. If the student is uncomfortable making direct contact with the individual(s) involved, they should contact the advisor or the person in charge of the unit where the action occurred (program or department chair, section chair, lab manager, etc.).
Graduate School Appeal Process:
An official review of procedures can be initiated by the Graduate School if a student feels that their grievance was not appropriately handled or resolved at the program/department or school/college level or through consultation with other resources listed on the Graduate School’s website. Initial contact may be made through the Associate Dean in the student’s division (Arts and Humanities, Biological Sciences, Physical Sciences, or Social Studies; (608) 262-1044) or through the Assistant Dean of Graduate Admissions and Academic Services (AAS; (608) 262-2433).

If the student wishes to file an official appeal of a grievance decision, they should consult with the Assistant Dean of AAS.

If a student is not satisfied with the initial appeal to the Graduate School Associate Deans, they may make a final appeal to the Graduate Faculty Executive Committee (GFEC) within 30 days of date of the above written decision.

(Please visit http://grad.wisc.edu/education/acadpolicy/guidelines.html#97 for the latest policies and guidelines.)

**Program Information Accessibility**

*How does the program communicate standards (student handbooks, web sites, notification of progress or lack of progress)? Does the department web site publish satisfactory progress criteria, guidelines for graduate study, admission criteria, faculty interests, curriculum? Is the information on the program’s web site consistent with that published in the Graduate School Catalog? Are courses needed by the students readily available? How accessible is the director to students, staff and faculty? How involved is the executive committee?*

**Student Services**

A Student Services Coordinator (Program Coordinator) in the Department of Biochemistry actively monitors the progress of students. This office sends regular email reminders and is available to answer questions and works closely with faculty and students. This office is also responsible for filing necessary paperwork with the Graduate School (warrant requests, warrants, etc.). A database of student records is maintained for accurate record keeping and easy assessment of student progress.

In addition to support provided by the Program Coordinator, the chair of the Steering Committee is accessible to students when needed and advertises this policy to the students. The chair provides an additional faculty contact outside of the student’s primary advisor. The chairs of both departments are accessible to students as well when needed. Through the Program Coordinator and Steering Committee chair, the IPiB Steering Committee remains informed of circumstances as they arise and provides input. The Steering Committee also has a monthly standing meeting and stays very in touch with the oversight of the program.
**Program Website** ([http://ipib.wisc.edu](http://ipib.wisc.edu))

The Program maintains a website that is used to recruit new students and to inform current students. At the present time, the website is under a complete redesign to keep up with changing needs. Plans are in place to make the website more useful for currently enrolled students and alumni. The latest version of the program handbook and useful forms can always be found on the website.

**Courses**

Course information is readily available in the IPiB Handbook and on the Program website. Required core courses, as well as the most popular electives, are offered every year. Students do not have trouble enrolling in courses need for their studies. Students have a wide range of courses to take for elective credits from not only Biochemistry and Biomolecular Chemistry but also from across campus.

**Timeline**

Section 4.2 of the IPiB Handbook outlines in detail the timeline of the program (Appendix A). In addition, a graphical display can be found in Appendix B.

**Assessment of Graduate Student Learning Outcomes**

Are common learning outcomes for all graduate students in the program clearly defined and known to both faculty and students? Does the program collect and analyze evidence to determine if learning by graduate students meets the program’s expectations and if graduate students are prepared for work in the profession? Does the program use the results of its assessment activities for program improvement and continue to monitor the effects of the changes? Overall, is the program engaged in a coherent process of continuous curricular and program improvement?

Program learning outcomes are clearly defined in the IPiB Handbook, which is available to all faculty and students. The Program Coordinator reminds faculty and students of expectations and requirements at important milestones throughout the program timeline (e.g. preliminary exam requirements, committee meeting requirements, thesis requirement).

The program office collects and maintains detailed records on each student including semester grade reporting. Students are required to file detailed reports from each committee member regarding the preliminary exam. Students must also file forms related to seminar presentations and committee composition.

Yearly committee meetings are required of all students in the program. At this yearly meeting, students are required to give a report on their research progress and future plans to their graduate committees. After a brief oral presentation, the student and committee (the major advisor and at least two committee members must be present) discuss the progress made, future plans, and complete an evaluation form summarizing the progress to date and future plans. The evaluation form is returned to the Program Office and becomes part of the student’s file.
As part of the curriculum review, students were surveyed to gain valuable input about their assessment of the program. This survey provided input related to what courses students found most beneficial and least beneficial to their graduate career. In addition, information was learned as to what additional courses students felt would better prepare them as a scientist. The survey questions are included in Appendix P.

In addition to the curriculum review, the Steering Committee routinely reviews the program handbook and updates policies and procedures as needed.

**Optional Questions for Interdisciplinary Programs**

_How is the program administered? What are the responsibilities of each department, unit, school or college? How are students learning to integrate more than one discipline to address complex research questions? Are students using instruments, techniques or theories from more than one discipline? How do you ensure students have the tools to pursue problem-based and other types of interdisciplinary research? Are interdisciplinary endeavors reflected in master’s theses and doctoral dissertations and how are they evaluated?_

Biochemistry is interdisciplinary by definition due to its broad reaches into the biological and physical sciences. In addition to the broad nature of biochemistry as a discipline, IPiB was formed from departments within two different schools on the UW Campus (Biochemistry from the College of Agriculture and Life Sciences and Biomolecular Chemistry from the School of Medicine and Public Health). The Program spans the spectrum from basic science to medically-focused research.

Several IPiB faculty have appointments in other departments on campus. The IPiB faculty are also trainers in many programs across the UW campus. This creates labs within IPiB with an interdisciplinary approach to science. The scientific diversity of faculty within IPiB makes it very straightforward for students to pursue interdisciplinary research and to form a thesis committee able to knowledgeably guide their dissertation. Biochemistry is both a physical and biological science, and our students and faculty reflect a range of scientific interfaces, including predictive modeling, clinical medicine, device engineering, and energy science.

Two recently introduced IPiB courses are crosslisted in Mathematics and Biostatistics in addition to both IPiB departments. These courses integrate computational mathematics with predictive models for structural and systems biology. They have an interdisciplinary, problem-based structure, with the majority of the course credit resulting from projects in which students collaborate, implement mathematical models, and give oral and written reports.

**Administration**

Both departments jointly administer the program. IPiB Committees are composed of faculty members from both departments. The departments support the rotational salaries during the rotation period and the costs of recruiting graduate students. The Biomolecular Chemistry Student Services Coordinator is charged with overseeing the recruiting and admissions process.
The Biochemistry Student Services Coordinator is charged with overseeing the day-to-day operations of the program.

Program authority to set degree requirements beyond the minimum required by the Graduate School lies with the Biochemistry and Biomolecular Chemistry faculty. Day-to-day Program administration is delegated by Program faculty to the Steering Committee, whose membership is appointed by the Department Chairs. The Steering Committee meets roughly once per month. The Steering Committee, aided by Program staff and related faculty committees (New Student Orientation Committee (NSOC), Student-Faculty Liaison Committee (SFLC), Examinations & Certification Committee (ECC), and Admissions Committee), provides guidance to students and faculty with regard to Graduate School and Program requirements, and arbitrates any requests for exceptions to Program requirements.
APPENDIX

A. IPiB Handbook – 1A
B. Graphical View of Program – 46A
C. Graduate Program Profile – 47A
D. Request for Biological Sciences Graduate Student Support Funds – 51A
E. Graduate School Catalog – 77A
F. IPiB Committee Members & Committee Duties – 81A
G. Current IPiB Students – 84A
H. Graduate Degrees Since Fall 2006 – 94A
I. Faculty
   1. Department of Biochemistry – 99A
   2. Department of Biomolecular Chemistry – 100A
J. Faculty Awards
   1. Department of Biochemistry – 101A
   2. Department of Biomolecular Chemistry – 104A
K. Curricula Vitae
   1. Department of Biochemistry Faculty – 105A
   2. Department of Biomolecular Chemistry Faculty – 235A
L. Trainer Application – 281A
M. IPiB Core Course Information – 282A
N. Syllabi from Core Courses
   1. Biochemistry 660 – 283A
   2. Biochemistry/BMC 701 – 285A
   3. Biochemistry/BMC 710 – 290A
O. Student Evaluations from Core Courses
   1. Biochemistry 660 – 292A
   2. Biochemistry/BMC 701 – 295A
   3. Biochemistry/BMC 710 – 300A
P. IPiB Curriculum Survey – 307A
Q. Department Planning Profile
   1. Department of Biochemistry – 313A
   2. Department of Biomolecular Chemistry – 317A
R. School of Medicine and Public Health Questions and Answer Locations – 321A
## Appendix 2
### Biochemistry Faculty

<table>
<thead>
<tr>
<th>Rank</th>
<th>Years Since Degree</th>
<th>Years at UW</th>
<th>Years with Biochem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amasino, Richard M.</td>
<td>30</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Ansari, Aseem Z.</td>
<td>17</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Attie, Alan D.</td>
<td>32</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Bednarek, Sebastian Y.</td>
<td>20</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Butcher, Samuel E.</td>
<td>17</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Clagett-Dame, Margaret</td>
<td>27</td>
<td>23</td>
<td>16</td>
</tr>
<tr>
<td>Cleland, Wm Wallace</td>
<td>57</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>Cox, Michael M.</td>
<td>32</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Craig, Elizabeth A.</td>
<td>40</td>
<td>33</td>
<td>10</td>
</tr>
<tr>
<td>Fox, Brian G.</td>
<td>23</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Friesen, Paul D.</td>
<td>29</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Hayes, Colleen E.</td>
<td>39</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Holden, Hazel M.</td>
<td>30</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>Hoskins, Aaron</td>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Kiessling, Laura L.</td>
<td>23</td>
<td>21</td>
<td>15 (50%)</td>
</tr>
<tr>
<td>Kimble, Judith</td>
<td>34</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Landick, Robert</td>
<td>29</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Markley, John L.</td>
<td>42</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Martin, Thomas FJ.</td>
<td>38</td>
<td>34</td>
<td>18</td>
</tr>
<tr>
<td>Mitchell, Julie</td>
<td>14</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Nelson, David L.</td>
<td>43</td>
<td>41</td>
<td>41</td>
</tr>
<tr>
<td>Ntambi, James M.</td>
<td>27</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Pagliarini, David J.</td>
<td>7</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Palmenberg, Ann C.</td>
<td>37</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>Phillips, George N.</td>
<td>36</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Pike, J. Wesley</td>
<td>33</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Raines, Ronald T.</td>
<td>26</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Ralph, John</td>
<td>30</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Rayment, Ivan</td>
<td>37</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Record, M. Thomas</td>
<td>45</td>
<td>42</td>
<td>30 (50%)</td>
</tr>
<tr>
<td>Reed, George H.</td>
<td>44</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Senes, Alessandro</td>
<td>11</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Sussman, Michael R.</td>
<td>36</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>Weibel, Douglas B.</td>
<td>10</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Wickens, Marvin P.</td>
<td>34</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Wildonger, Jill</td>
<td>7</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>
## Appendix 3

### Faculty CVs

Table of Contents

<table>
<thead>
<tr>
<th>Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amasino, Richard M.</td>
<td>2</td>
</tr>
<tr>
<td>Ansari, Aseem Z.</td>
<td>4</td>
</tr>
<tr>
<td>Attie, Alan D.</td>
<td>7</td>
</tr>
<tr>
<td>Bednarek, Sebastian Y.</td>
<td>11</td>
</tr>
<tr>
<td>Butcher, Samuel E.</td>
<td>14</td>
</tr>
<tr>
<td>Clagett-Dame, Margaret</td>
<td>17</td>
</tr>
<tr>
<td>Cleland, Wm Wallace</td>
<td>20</td>
</tr>
<tr>
<td>Cox, Michael M.</td>
<td>22</td>
</tr>
<tr>
<td>Craig, Elizabeth A.</td>
<td>26</td>
</tr>
<tr>
<td>Fox, Brian G.</td>
<td>30</td>
</tr>
<tr>
<td>Friesen, Paul D.</td>
<td>34</td>
</tr>
<tr>
<td>Hayes, Colleen E.</td>
<td>37</td>
</tr>
<tr>
<td>Holden, Hazel M.</td>
<td>40</td>
</tr>
<tr>
<td>Hoskins, Aaron</td>
<td>43</td>
</tr>
<tr>
<td>Kiessling, Laura L.</td>
<td>47</td>
</tr>
<tr>
<td>Kimble, Judith</td>
<td>50</td>
</tr>
<tr>
<td>Landick, Robert</td>
<td>54</td>
</tr>
<tr>
<td>Markley, John L.</td>
<td>58</td>
</tr>
<tr>
<td>Martin, Thomas F.J.</td>
<td>62</td>
</tr>
<tr>
<td>Mitchell, Julie</td>
<td>65</td>
</tr>
<tr>
<td>Nelson, David L.</td>
<td>69</td>
</tr>
<tr>
<td>Ntambi, James M.</td>
<td>75</td>
</tr>
<tr>
<td>Pagliarini, David, J.</td>
<td>79</td>
</tr>
<tr>
<td>Palmenberg, Ann C.</td>
<td>82</td>
</tr>
<tr>
<td>Phillips, George N.</td>
<td>85</td>
</tr>
<tr>
<td>Pike, J. Wesley</td>
<td>88</td>
</tr>
<tr>
<td>Raines, Ronald T.</td>
<td>91</td>
</tr>
<tr>
<td>Ralph, John</td>
<td>94</td>
</tr>
<tr>
<td>Rayment, Ivan</td>
<td>104</td>
</tr>
<tr>
<td>Record, M. Thomas</td>
<td>107</td>
</tr>
<tr>
<td>Reed, George H.</td>
<td>111</td>
</tr>
<tr>
<td>Senes, Alessandro</td>
<td>115</td>
</tr>
<tr>
<td>Sussman, Michael R.</td>
<td>117</td>
</tr>
<tr>
<td>Weibel, Douglas B.</td>
<td>121</td>
</tr>
<tr>
<td>Wickens, Marvin P.</td>
<td>125</td>
</tr>
<tr>
<td>Wildonger, Jill</td>
<td>129</td>
</tr>
</tbody>
</table>
Richard M. Amasino
Professor, Department of Biochemistry
Director, Education and Outreach, Great Lakes Bioenergy
University of Wisconsin-Madison

Education:
1974-77 The Pennsylvania State University, University Park, PA, B.S. in Biology
1977-82 Indiana University, Bloomington, IN, Ph.D. Biology/Biochemistry

Positions Held:
1996- Professor, Department of Biochemistry, University of Wisconsin
1991-96 Associate Professor, University of Wisconsin-Madison
1985-91 Assistant Professor, University of Wisconsin-Madison
1982-85 Senior Fellow, Department of Biochemistry, University of Washington, Seattle, WA

Professional Service:
2006 President – American Society of Plant Biologists
2006, 2008 vice-Chair and Chair, Plant Molecular Biology Gordon Conference
2002 Organizer, 61st Annual Meeting of the Society for Developmental Biology
1996 - Organizer, 7th, 9th, 10th, 11th and 12th International Conference on Arabidopsis Research
1997-2000 Board of Directors, International Society for Plant Molecular Biology
1996-1999 North American Arabidopsis Steering Committee (NAASC)
1995 Guest Editor, Seminars in Developmental Biology Series
1992 Organizer, Steenbock Symposium on Cellular Communication in Plants
1990 Organizer, Eleventh Annual Conference on Agrobacterium Research

Editorial Boards of Journals:
2007 - present Journal of Plant Biology
2006 - present PNAS
2004 – 2011 Science, Board of Reviewing Editors
2001 - 2008 The Plant Journal
1999 - present Plant, Cell and Environment
1997 - present Plant Physiology

Awards:
2011 Residence Hall Honored Instructor Teaching Award
2009 Elected Fellow of the American Society of Plant Biologists
2009 Underkofler Teaching Excellence Award, University of Wisconsin System
2008 Spitzer Excellence in Teaching Award, College of Agriculture
2008 Hilldale Professorship
2006 U.S. National Academy of Sciences
2006 Howard Hughes Medical Institute Teaching Professor
2005 Kellett Award
2005 Hilldale Award in the Biological Sciences
1999 Alexander von Humboldt Foundation Award
1999 Vilas Associate Award
1998 Wisconsin Distinguished Professorship
1989 Presidential Young Investigator Award
1986 McKnight Foundation Individual Research Award in Plant Biology
1986 Shaw Scholar Award
1985 Steenbock Career Development Award
10 Relevant Publications:


Synergistic Activities:
Associate Director, Biotechnology Center (responsible for Education and Outreach)
Howard Hughes Medical Institute Professor (HHMI funds other educational efforts through this program)
BIOGRAPHICAL SKETCH

NAME
Ansari, Aseem Z.

POSITION TITLE
Professor of Biochemistry
Member of the Genome Center of Wisconsin

eRA COMMONS USER NAME (credential, e.g., agency login)
AZANSARI

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Xavier’s College, Bombay University, India</td>
<td>B.Sc.</td>
<td>1987</td>
<td>Chemistry and Zoology</td>
</tr>
<tr>
<td>Northwestern University, Evanston, IL</td>
<td>Ph.D.</td>
<td>1995</td>
<td>Biochemistry</td>
</tr>
</tbody>
</table>

A. Personal Statement
The key goals of my research program are to explore regulatory mechanisms that govern gene circuits and to create synthetic transcriptional regulators that control gene circuits and thereby dictate desired biological outcomes. To achieve those goals we integrate chemical, biological, genomic and computational approaches.

B. Positions and Honors
Positions and Employment:

2011- Professor – Department of Biochemistry, UW-Madison, WI
2008-2011 Associate Professor – Department of Biochemistry, UW-Madison, WI
2002-2007 Assistant Professor – Department of Biochemistry, UW-Madison, WI
2008- Founder and co-Director, Khorana Program of Scientific Exchange
2002- Member, Genome Center of Wisconsin, UW-Madison, WI
1998-2001 Research Associate with Mark Ptashne, Memorial Sloan-Kettering Cancer Center, NY
1996-1998 Resident Tutor, Winthrop House, Harvard University, Cambridge, MA
1997-1998 Visiting Scientist with Richard Young, Whitehead Institute (MIT), Cambridge, MA
1996 Visiting JSPS Fellow with Akira Ishihama, National Institute of Genetics, Mishima, Japan
1987 Research Fellow with Obaid Siddiqi, Tata Institute for Fundamental Research, Bombay

Honors & Awards:
H. I. Romnes Faculty Award, University of Wisconsin – Madison
CAREER award, National Science Foundation, 2008-2013
Pound Research Award, Glen Pound Foundation (CALS award) 2008
Vilas Associates Award, Vilas Trustees, University of Wisconsin-Madison, 2006 & 2007
Shaw Scholar Award, The Greater Milwaukee Foundation, 2006-2011
Research Excellence Award, W. M. Keck Foundation, 2005
Basil O’Connor Starter Scholar Award, March of Dimes Foundation, 2004-2006
Steenbock Career Development Award, UW Madison, 2002-2007
Helen Hay Whitney post-doctoral fellowship, 1994-1997
Board of Tutors in Biochemical Sciences, Harvard University, 1995-1998
Japan Society for Promotion of Science short fellowship, Japan, 1996
Junior Fellow, Harvard Society of Fellows, Harvard University (short listed), 1994
First prize for graduate research, Sigma Xi Research Society, 1992
University Fellow, Northwestern University, 1989
President’s honor roll, University of Oklahoma 1987
E. Currimbhoy Merit Scholarship, Bombay University, 1987-1988
D. Sethna Foreign Studies Scholarship, Sethna Foundation, Bombay, 1987-1988
First place in college merit list in chemistry & zoology, St. Xavier’s College, Bombay, 1987
Student cadet advisor to the Vice Chancellor, Bombay University, 1986
C. Selected Publications (subset of 15 out of 52):


D. Current Support:

1) National Institutes of Health      01/01/2006 – 12/31/2010
GM069420 (R01)
*Modular Design of Synthetic Transcriptional Regulators*
   The major goals of the project are to develop precisely tailored synthetic regulators that target genes cooperatively with cell-type specific transcription factors.

2) National Institutes of Health (NCI) 07/01/2008 – 06/30/2013
CA133508 (R01)
*Targeting E2a-Pbx1 with synthetic regulators*
   The major goal of this grant is focused on understanding and controlling the gene networks that govern the onset of leukemia by utilizing genomic and chemical strategies to target the oncogenic protein E2a-Pbx1.

3) National Institutes of Health (NHLBI) 9/30/09-6/30/2016
HL099773 (U01) (Co-PI with Thomson, Kamp, Slukvin, and Soh)
“Midwest Progenitor Cell Consortium”
   The goal of this proposal is to develop new strategies to convert human pluripotent stem and somatic cells into hematopoietic stem cells and self-renewing cardiac progenitor cells through identification of genetic programs leading to the formation of pre-HSCs and cardiac progenitors.

4) National Science Foundation       7/1/08 – 6/30/13
CAREER MCB-0747197
*Role of Kin28 in sequential Polymerase II and Histone modifications*
   The major goal of this grant is a chemical-genomics approach to investigate the role of Kin28 (Cdk7 in metazoans) and to examine the novel roles of this kinase.

*Shaw Scholar Award*
   The goal of the research is to understand the regulation of gene circuits.

7) March of Dimes Foundation      06/01/07 – 05/31/2010
*Designing Small Molecule Mimics of Developmental Regulators*
   The major goals of this project are to design synthetic mimics of developmental regulators.

E. Synergistic activities:

1) International Undergraduate Exchange program: To enhance international education for undergraduates I have developed and initiated a *Khorana Scholars program*. Under the aegis of this program, students from leading institutions in India work over the summer at UW and students from UW work in leading labs in India.

2) Minority outreach/academic mentoring: NSF-REU program, providing under-represented minorities from 4-year colleges with laboratory experience; participate in “Partners” program for academic mentoring to minority students on campus; participate in “Faculty of color” program to enhance the academic climate for students.

3) Interdisciplinary research: Initiated the synthetic biology undergraduate group by encouraging engineering students to work on biological problems. Collaborate extensively with engineers, synthetic organic chemists, bioinformaticians, nanotechnologists, structural biologists, and microbiologists. I also co-founded the Wisconsin Institute for Design of Genetically Engineered Technologies (WIDGET).

4) Education Outreach, Teaching: member of two NSF-REU programs, *undergraduate* research program in molecular biology, undergraduate research in biology, member of several interdisciplinary *graduate* training programs –computation, informatics in biology and medicine (CIBM), chemistry and biology interface (CBI), cellular and molecular biology (CMB), genome sciences training program (GSTP), biotechnology (BTP), microbiology doctoral (MDTP), molecular bioscience (MBTG) medical science (MSTP).

5) Teaching: Developed the curriculum for graduate level molecular biology course (Biochem 620), and an undergraduate seminar course (Biochem 511).
BIOGRAPHICAL SKETCH

NAME
Alan D. Attie

POSITION TITLE
Professor of Biochemistry

eRA COMMONS USER NAME
adattie

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Wisconsin-Madison</td>
<td>B.S.</td>
<td>1972-1976</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>University of California-San Diego</td>
<td>Ph.D.</td>
<td>1976-1980</td>
<td>Biology</td>
</tr>
<tr>
<td>University of California-San Diego</td>
<td>Post-doc</td>
<td>1980-1982</td>
<td>Lipid Metabolism</td>
</tr>
</tbody>
</table>

A. Personal Statement
Alan Attie began his research career by studying lipid and lipoprotein metabolism. In mid-career, he shifted to work on genetics of obesity and diabetes. The lab is presently devoted to identification and characterization of new genes that confer susceptibility to obesity-induced diabetes and contribute to diabetes complications. His laboratory combines metabolic research with cutting edge approaches to genetics and genomics. The laboratory has a highly experienced permanent staff with expertise in physiological studies of insulin secretion, insulin action, lipid and lipoprotein metabolism, and quantitative genetics and is experienced in in vivo studies in numerous animal models as well as in vitro studies in tissue culture models of adipose, muscle, liver, and β-cells.

B. Positions and Honors

Positions and employment
1982-1989: Assistant Professor, Departments of Biochemistry & Comparative Biosciences, University of Wisconsin-Madison.
1989- 1995: Associate Professor, Departments of Biochemistry & Comparative Biosciences, University of Wisconsin-Madison.
1995-present: Professor, Department of Biochemistry, University of Wisconsin-Madison.
2010-present: Affiliate Member, Institute for Systems Biology, Seattle, WA.

Honors & awards
- 1980: "Fellows' Research Award", American Association for the Study of Liver Disease
- 1980-1982: Postdoctoral Fellowship Award, American Liver Foundation.
- 1984-1989: Shaw Scholar Award.
- 1993: Romnes Fellow Award
- 1995: David Rubinstein Memorial Lecturer, Canadian Lipoprotein Conference
- 1998: Dave McClain Research Award, American Heart Association/Wisconsin Affiliate
- 2000: Vilas Associate Award
- 2001: Carl J. Norden Distinguished Teaching Award (Honorable Mention)
- 2003: Co-Chairman, Atherosclerosis Gordon Conference
- 2006: Visiting Professor, Fellows in Cardiovascular Medicine, Cleveland Clinic
- 2009: Jack Gorski Professorship in Biochemistry, University of Wisconsin-Madison

Editorial Boards
- Diabetes (2003-2006)
B. Selected publications from 2006-2011


**Recent Review Articles**


**D. Research Support (Attie)**

**ACTIVE**

| R01 DK066369 | 02/19/2010-11/30/2014 | 2.40 calendar | Genes and Gene Networks Associated with Obesity and Diabetes |
| NIH/ NIDDK | $408,374 |

| R01 DK058037 | 06/1/2006-05/31/2012 | 2.40 calendar | The Genetics of Obesity and Diabetes |
| NIH | $444,439 |

| R01 HL101189 | 04/15/2010-03/31/2012 | 0.60 calendar | A Genomic/Metabolomic Strategy to Characterize Cardiac Mitochondrial Dysfunction |
| Burnham Institute for Medical Research (NIH sub) | $39,871 |

This work focuses on the transcriptional coactivator PGC-1, which is known to drive mitochondrial biogenesis and functional capacity in the heart.
Identification of Novel Pancreatic Beta-Cell Mitogens in Human Islets.

Our analysis demonstrates that by integrating multiple gene array data sets across species and model systems can identify several interesting candidate genes, all with plausible roles in cell cycle control, to be tested for their potential to promote beta-cell proliferation in human islets.

The Collaborative Cross Project on Obesity and Diabetes

Our aim is to ascertain the range of variability of the phenotypes will measure so that we can justify a larger study of the recombinant inbred strains.

American Diabetes Association Mentor-Based Fellowship 7-11-MN-03 07/01/11-06/30/15. Supports one post-doctoral fellow in the laboratory.

PENDING

The Genetics of Obesity and Diabetes

The major goals of this project are to investigate the role of Tomosyn-2 in insulin secretion, investigate the role of Sorcs1 in insulin and leptin transport, and investigate the role of Ptger3 in insulin secretion.

Characterizing Novel Glucose Transporters in Relation to Insulin Secretion from Pancreatic Beta-Cells

The major goal of this project is to evaluate the role of this new class of glucose transporters in the context of regulated insulin secretion from pancreatic islets.

Mechanisms to Preserve Beta-cell Function and Mass in Type 2 Diabetes in Youth

The major goal of this project to explore the ability of this pathway to prevent and treat diabetes in an animal model of type 2 diabetes and in cells from human donors.
NAME

Sebastian York Bednarek

POSITION TITLE

Professor

EDUCATION/TRAINING

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Wisconsin, Madison, Wisconsin</td>
<td>B. S.</td>
<td>1984</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>University of Wisconsin, Madison, Wisconsin</td>
<td>B. S.</td>
<td>1984</td>
<td>Molecular Biology</td>
</tr>
<tr>
<td>University of California, Berkeley, California</td>
<td>post-doctoral</td>
<td>1993-1996</td>
<td>Biochemistry</td>
</tr>
</tbody>
</table>

Professional Experience

1987-1992 Graduate Research Assistant, DOE-Plant Research Laboratory, Michigan State University, E. Lansing, MI.
1993-1996 Postdoctoral Research Fellow, Department of Molecular and Cell Biology, University of California, Berkeley, CA
1996-2003 Assistant Professor, Department of Biochemistry, University of Wisconsin, Madison, WI
2003-present Associate Professor, Department of Biochemistry, University of Wisconsin, Madison, WI
2010 Professor, Department of Biochemistry, University of Wisconsin-Madison

Honors and Awards

1991 Bessey Memorial Award for graduate research: Michigan State University, Department of Botany and Plant Pathology
1998-2003 Shaw Scientist Award, Milwaukee Foundation
2002-2003 DuPont Center for Collaborative Research and Education Award
2010 UW-Madison, College of Agricultural and Life Sciences, Jung Excellence in Teaching Award
2011 UW-Madison, The Graduate School, Vilas Associate Award

Publications (2001-present):

Peer Reviewed Research Publications:


Invited Reviews and Book Chapters:


BIOGRAPHICAL SKETCH

NAME
Butcher, Samuel E.

POSITION TITLE
Professor

eRA COMMONS USER NAME
SEBUTCHER

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of California at Davis</td>
<td>B.S.</td>
<td>1989</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td>University of Vermont</td>
<td>Ph.D.</td>
<td>1995</td>
<td>Molecular Genetics</td>
</tr>
<tr>
<td>University of California at Los Angeles</td>
<td>postdoc</td>
<td>1995-2000</td>
<td>Chemistry</td>
</tr>
</tbody>
</table>

A. Personal Statement

My research focus is to understand the structure and function of RNA and ribonucleoprotein complexes that regulate gene expression. We employ a variety of biophysical methods in these studies, including nuclear magnetic resonance (NMR) spectroscopy, UV and fluorescence spectroscopy, and calorimetry (isothermal titration and differential scanning calorimetry). I have studied the structure and function of RNAs and proteins for the past 11 years. My laboratory has made a number of significant contributions to understanding the structural biology of the spliceosome, including the determination of structures from U6 and U2 RNA, the splicing factor Prp24, and the U6 RNA-Prp24 complex. Additionally, we study HIV-1 stimulated translational frameshifting and have described the interaction of small drug-like molecules with the HIV-1 frameshift site RNA. We also investigate the thermodynamics of higher order RNA folding, focusing on the ubiquitous tetraloop receptor interaction as a model system. While studying tetraloop receptor mediated RNA folding, my group recently discovered that isothermal titration calorimetry can be applied in a time-resolved fashion to simultaneously extract both kinetic and thermodynamic information for molecular interactions. This is a powerful method that can provide rich information about molecular folding processes.

B. Positions and Honors

Employment

2000 - 2005  Assistant Professor, Dept. of Biochemistry, University of Wisconsin, Madison.
2005 - 2010  Associate Professor, Dept. of Biochemistry, University of Wisconsin, Madison.
2010 -      Professor, Dept. of Biochemistry, University of Wisconsin, Madison

Other Experience and Professional Memberships

2000-        RNA Society member
2004        Ad Hoc Reviewer, American Cancer Society, Genetic Mechanisms of Cancer study section
2005        Ad Hoc Reviewer, NIH AIDS Molecular and Cellular Biology Study Section
2007-        Editorial Board Member, Biomolecular NMR Assignments
2007-        Editorial Board Member, Biophysical Journal
2006        Ad Hoc Reviewer, NIH Macromolecular Structure and Function Study Section B
2007-2011   Reviewer, NIH Macromolecular Structure and Function Study Section
Awards and Honors

1995-1998  Jane Coffin Childs Memorial Fund Postdoctoral Fellow, UCLA
1998-2000  Jonsson Cancer Center Postdoctoral Fellow, UCLA
2002-2007  Shaw Scientist Award, Milwaukee Research Foundation
2010-2012  Vilas Associate Award, University of Wisconsin-Madison.

C. Selected peer-reviewed publications (15 most relevant to current application)

D. Research Support

Ongoing Research Support

Structure and Function of U6 Spliceosomal RNA No cost extension to 8/31/2012
The major goals of this project are to determine the structure and function in pre-mRNA splicing of the U6 RNA-Prp24 complex and the U2/U6 RNA complex.

NIH R01 GM072447-06 (Butcher) 04/01/10-03/31/14
HIV frameshift site RNA structure and ligand binding
The goal of this study is to determine the structure of the HIV frameshift site RNA and investigate ligand binding.

NIH S10 RR027000-01 (Butcher) 10/06/11
Small Angle X-ray Scattering Instrument
The purpose of this shared equipment grant is to provide a small angle X-ray scattering instrument to the National Magnetic Resonance Facility at Madison.

5P41 RR02301-25 (Markley) 04/1/2010-03/31/2015
National Biomedical NMR Resource at Madison
The goal of this project is to provide a national biomedical NMR resource facility providing researchers with access to state of the art NMR spectrometers and resources. This project supports NMR technology research and development in several areas, including structure determination of challenging biomolecular systems.
Role: Co-PI (no funds to Butcher)
BIOGRAPHICAL SKETCH

NAME
Clagett-Dame, Margaret

POSITION TITLE
Professor of Biochemistry and Pharmaceutical Sciences

eRA COMMONS USER NAME (credential, e.g., agency login)
MCCLAGET

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pennsylvania State University</td>
<td>B.S.</td>
<td>05/1975</td>
<td>Nutrition</td>
</tr>
<tr>
<td>Pennsylvania State University</td>
<td>M.S.</td>
<td>08/1977</td>
<td>Nutrition</td>
</tr>
<tr>
<td>University of Wisconsin-Madison</td>
<td>Ph.D.</td>
<td>12/1985</td>
<td>Biochemistry</td>
</tr>
</tbody>
</table>

A. Personal Statement

The vitamin A metabolite, all-trans retinoic acid (atRA) is essential for reproduction, embryonic, and postnatal development, including nervous system development. A major goal is to identify and study atRA-responsive genes that are required for normal nervous system development. Using loss- and gain- of-function studies in cells as well as mouse mutants we have shown that the atRA-responsive gene, Nav2, is essential for retinoid-induced neurite outgrowth in human neuroblastoma cells, and when expressed ectopically, can rescue the defect in mechanosensory axonal elongation in the C. elegans mutant, unc53. Nav2 is also required in vivo for normal development of the cranial nerves and their downstream control of blood pressure, as well as formation of parallel axon fibers and neuronal migration in the developing cerebellum. Ongoing studies are directed at exploring the roles of Nav2 and other atRA-responsive genes such as Clmn and HEF1/Nedd9 in the developing cortex, hippocampus and cerebellum, and at discovering protein interacting partners using a yeast-two-hybrid screen. My cross-disciplinary training and approaches put me in a unique position to study retinoid signaling and neural development from the molecular/cellular level to that of the whole animal.

We are also devoting considerable effort to the development and study of retinoids and vitamin D analogs that may be useful in medical applications. Recent studies suggest that a stable carbon linked analog of 4-hydroxyphenylretinamide, as well as several glucuronide retinoid conjugates are useful in chemoprevention and chemotherapy, and have reduced toxicity relative to the parent compounds. Recently, we have identified a unique subset of vitamin D analogs that have positive activity in a mouse model of acne. We are currently exploring the molecular basis of these positive therapeutic effects.

B. Positions and Honors

Positions and Employment
1977-78 Clinical Dietitian, Children's Hospital of Michigan, Detroit, MI
1978-81 Clinical Nutrition Research Associate, Ross Labs, Columbus, OH
1981-86 Graduate Research Assistant, Dept. of Biochemistry, Univ. of Wisconsin, Madison, WI
1986-89 Biochemist, Neuroscience Research Division, Abbott Labs, Abbott Park, IL
1989-95 Assistant Professor, Pharmacology, Univ. of Wisconsin, Madison, WI
1995-01 Associate Professor, Pharmaceutical Sciences, Univ. of Wisconsin, Madison, WI
1996-01 Associate Professor, Dept. of Biochemistry, Univ. of Wisconsin, Madison, WI
2001- Professor, Pharmaceutical Sciences, Univ. of Wisconsin, Madison, WI
2001- Professor, Dept. of Biochemistry, Univ. of Wisconsin, Madison, WI

Other Experience and Professional Memberships
1974  Phi Kappa Phi  
1974,75  Evan Pugh Award, Pennsylvania State University  
1975  Undergraduate College Class Marshall, Pennsylvania State University  
1975-95  Member, American Dietetic Association  
1981-83  NIH Graduate Trainee, Cell & Molecular Biology, Univ. of Wisconsin, Madison, WI  
1984-85  Peterson Fellowship, Department of Biochemistry, Univ. of Wisconsin, Madison, WI  
1989-  Member, Society for Neuroscience  
1990-04  Affiliate Member, Neuroscience Training Program, Univ. of Wisconsin, Madison, WI  
1990-  Member, Interdepartmental Grad. Prog. Nutr. Sci., Univ. of Wisconsin, Madison, WI  
1991-  Member, Society for Experimental Biology and Medicine  
1992-  Member, American Society for Biochemistry and Molecular Biology  
1993-  Member, American Institute of Nutrition  

C. Selected Peer-reviewed Publications  

2. Anding AL, Chapman JS, Barnett DW, Curley RW Jr, Clagett-Dame M. The unhydrolyzable fenretinide analogue 4-hydroxybenzylretinone induces the proapoptotic genes GADD153 (CHOP) and Bcl-2-binding component 3 (PUMA) and apoptosis that is caspase- dependent and independent of the retinoic acid receptor. Cancer Res 2007; 67(13):6270-6277.  


D. Research Support

**Ongoing Research Support**

Deltanoid Pharmaceuticals     Clagett-Dame (PI)     05/01/03-04/30/12

Vitamin A and D Analog Studies (formerly: Vitamin A Analog Studies)
The goal of this project is to evaluate novel retinoid and vitamin D compounds for the treatment of skin disorders.
Role: PI

Deltanoid Pharmaceuticals     DeLuca & Clagett-Dame (Co-PI) 10/01/02-09/30/12

Biological Activities of the 2-Carbon-Modified Analogs of 1α,25-Dihydroxyvitamin D3.
The goal of this project is to investigate the mechanism of action and utility of modified vitamin D compounds. Major emphasis is on the development of analogs for the treatment of osteoporosis and bone loss associated with renal failure.
Role: Co-PI

R01 CA49837 (Years 10-15)     Curley (PI)     05/01/03-3/31/14

NIH/National Cancer Institute     Clagett-Dame (Co-PI)

Analog Studies of 4-HPR and its Glucuronide.
Role: PI/subcontract
The goals of this project are to study 4-HPR analogs, and to explore their mechanism of action in chemoprevention and chemotherapy.

**Completed Research Support**

T32-DK007665     Eisenstein (PI)     07/01/09-06/30/11

Molecular and Applied Nutrition Training Program
Post-doctoral training slot – T. Mavencamp

The goal of the supported project was to understand how NAV2 functions in neurite outgrowth and axonal elongation.
NAME
Cleland, Wm. Wallace

POSITION TITLE
M.J. Johnson Professor of Biochemistry

eRA COMMONS USER NAME (credential, e.g., agency login)
WCLELAND

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YYYY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oberlin College, Oberlin, OH <em>(summa cum laude)</em></td>
<td>A.B.</td>
<td>1950</td>
<td>Chemistry</td>
</tr>
<tr>
<td>University of Wisconsin, Madison, WI</td>
<td>M.S.</td>
<td>1953</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>University of Wisconsin, Madison, WI</td>
<td>Ph.D.</td>
<td>1955</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>University of Chicago, Chicago, IL</td>
<td>Postdoc</td>
<td>1957-9</td>
<td>Biochemistry</td>
</tr>
</tbody>
</table>

NOTE: The Biographical Sketch may not exceed four pages. Follow the formats and instructions below.

A. Personal Statement

I have extensive experience in using isotope effects to determine enzyme mechanisms. My lab has an isotope ratio mass spectrometer which we use to measure C-13, N-15 and O-18 isotope effects. Errors are usually ~0.02% (that is, 1.0206 ± 0.0002). This precision allows accurate determination of mechanism and transition state structure.

B. Positions and Honors.

1955-1957: U.S. Army, Medical Nutrition Lab, Denver, Colorado
1957-1959: NSF Postdoctoral Fellow, University of Chicago with Dr. E.P. Kennedy
1959-Present: Professor, Department of Biochemistry, University of Wisconsin-Madison
Assistant Professor (1959-1962); Associate Professor (1962-1966); Professor (1966-); M.J. Johnson Professor of Biochemistry (1978-); Steenbock Professor of Chemical Science (1982-2002)

Honors and Awards:
Member, National Academy of Sciences, American Academy of Arts and Sciences
Merck Award, ASBMB (1990); Bader Award (1993); Repligen Award, ACS (1995); Stein and Moore Award, Protein Society (1999)

C. Selected Peer-reviewed Publications


### D. Research Support

RO1 GM18938-38A1 Cleland (PI)  09/15/09-8/31/11

Kinetic Studies of Enzyme Mechanisms

The purpose of this project is to develop kinetic tools for studying enzyme mechanisms and to apply them to representative enzymes.

RO1 GM70455-05  Cleland (PI)  05/01/09-04/30/13

The Structure and Function of Pyruvate Carboxylase

The purpose of this project is to determine the structure of pyruvate carboxylase by X-ray, and to carry out kinetic studies to determine the catalytic mechanism.
BIOGRAPHICAL SKETCH

NAME
Michael M. Cox

POSITION TITLE
Professor

eRA COMMONS USER NAME (credential, e.g., agency login)
MCOX30

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YYYY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Univ. of Delaware, Newark, DE</td>
<td>BA</td>
<td>1974</td>
<td>Biology</td>
</tr>
<tr>
<td>Brandeis Univ, Waltham, MA (W.P. Jencks)</td>
<td>PhD</td>
<td>1979</td>
<td>Biology</td>
</tr>
<tr>
<td>Stanford Univ, School of Medicine, Stanford, CA (I.R. Lehman)</td>
<td>Postdoc</td>
<td>1979-1982</td>
<td>Biochemistry</td>
</tr>
</tbody>
</table>

Please refer to the application instructions in order to complete sections A, B, C, and D of the Biographical Sketch.

A. Appointments

1993-present Assistant Chair, Department of Biochemistry, University of Wisconsin, Madison, WI
1992-present Professor, Department of Biochemistry, University of Wisconsin, Madison, WI
1987-1992 Associate Professor, Department of Biochemistry, University of Wisconsin, Madison, WI
1983-1987 Assistant Professor, Department of Biochemistry, University of Wisconsin, Madison, WI

B. Fellowships, honors, and awards

2011 Elected American Association for the Advancement of Science (AAAS) Fellow
2009 University of Wisconsin Regents’ Teaching Excellence Award
8/2009 Organizer, FASEB Summer Research Conference, Snowmass Village, Colorado
8/2008 Organizer, FASEB Summer Research Conference, Snowmass Village, Colorado
7/2007 Organizer, FASEB Summer Research Conference, Snowmass Village, Colorado
2/2006 Organizer, Keystone Symposium, Taos, New Mexico
2006-present Advisor, FASEB "Educating About Evolution: Subcommittee
2005-present Editorial Board, BioMed Central Microbiology
2002-present Editor-in-chief, Critical Reviews in Biochemistry and Molecular Biology
2002-2005 Member, US National Com for the International Union for Biochem & Mol Biol
6/2002 Organizer, Nucleic Acids Gordon Conference, Bristol, Rhode Island
1998-2001 ASBMB Council Member
2/88, 6/90, 2/02, 6/03, 10/05, 2/06, 10/07 NIH Microbial Physiology and Genetics Study Section (Ad hoc)
1/93-6/95 NIH Microbial Physiology and Genetics Study Section
1989 Eli Lilly Award sponsored by the American Chemical Society, Division of Biological Chemistry
1986-1991 Dreyfus Teacher-Scholar Award
7/84-6/89 National Institutes of Health Research Career Development Award
9/84-9/86 March of Dimes-Basil O'Connor Starter Research Grant (research award)
2/82 American Cancer Society and Bank of America-Giannini Foundation Postdoc Fellowship

C. Publications

Articles:


**Invited Papers:**


USA. Commentary. 106, 13147-13148. PMCID: PMC2726408.


D. Research Support

Ongoing:

–“Bacterial Proteins Involved in Recombinational DNA Repair”
  Principal Investigator: Michael M. Cox (PI)
  Agency: National Institutes of Health (NIGMS)
  R01 (GM32335, Years 29-33) 07/01/11-06/30/16
  This project is focused on RecA protein mechanism and regulation.
  Role: Principal Investigator

–“Tools for Improving the Quality of Aged, Degraded, Damaged, or Otherwise Compromised DNA Evidence”
  Principal Investigator: Michael M. Cox (PI), John Battista (co-PI: Subaward Louisiana State University and A&M College)
  Agency: National Institute of Justice (NIJ)
  2010-DN-BX-K190, Years 1-3 01/01/11-12/31/13
  This project is focused on the development of technologies to enhance the analysis of degraded forensic DNA samples.
  Role: Principal Investigator
  *Funds awarded for this project are divided between University of Wisconsin-Madison, Louisiana State University and A&M College, and The Crime Laboratory of Orange County, California.

Completed:

–“Bacterial Proteins Involved in Recombinational DNA Repair”
  Principal Investigator: Michael M. Cox (PI)
  Agency: National Institutes of Health (NIGMS)
  R01 (GM32335-27S2, Years 27-28) 09/30/09-05/31/11
  This project is focused on RecA protein mechanism and regulation.
  Role: Principal Investigator

–“Tools for improving the quality of aged, degraded, damaged, or otherwise compromised DNA evidence”
  Principal Investigators: John Battista (PI) and Michael M. Cox (Co-PI: Subaward University of Wisconsin-Madison)
  Agency: National Institute of Justice
  2007-DN-BX-K146, 07/01/07-06/30/10
  This grant was focused on technology development to enhance the forensic analysis of DNA samples.
  Role: Co-Principal Investigator

–“Double strand DNA break repair in D. radiodurans”
  Principal Investigators: Michael M. Cox (PI), James Keck (Co-PI), John Battista (Co-PI)
  Agency: National Institutes of Health
  R01 (GM67085-01A2, Years 1-4) 2/01/05-1/31/10
  This grant was focused on elucidating mechanisms of DNA repair in Deinococcus radiodurans
  Role: Co-Principal Investigator
BIOGRAPHICAL SKETCH

NAME
Elizabeth A. Craig

POSITION TITLE
Professor

eRA COMMONS USER NAME (credential, e.g., agency login)
ECRAIG

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Rhode Island, Kingston</td>
<td>B.S.</td>
<td>1968</td>
<td>Bacteriology</td>
</tr>
<tr>
<td>Washington University, St. Louis MO</td>
<td>Ph.D.</td>
<td>1972</td>
<td>Microbiology</td>
</tr>
<tr>
<td>St. Louis University, St. Louis MO</td>
<td>--</td>
<td>1973-75</td>
<td>Postdoc Molec Virology</td>
</tr>
<tr>
<td>University of California, San Francisco</td>
<td>--</td>
<td>1976-79</td>
<td>Postdoc Molec Biology</td>
</tr>
</tbody>
</table>

PROFESSIONAL EXPERIENCE:

1968-1972 NIH Predoctoral Trainee, Washington University
1972-1975 NIH Postdoctoral Fellow, St. Louis University
1976-1978 Senior Postdoctoral Fellow, ACS, University of California-San Francisco
1979-2002 Assistant, Associate, Full Prof of Biomolecular (Physiological) Chemistry, University of Wisconsin-Madison
1996-2002 Chair, Department of Biomolecular Chemistry, University of Wisconsin-Madison
2002-present Professor of Biochemistry, University of Wisconsin-Madison
2005-present Chair, Department of Biochemistry, University of Wisconsin

ACADEMIC HONORS and AWARDS:

1981-1986 NIH Research Career Development Award
1986-1991 Romnes Professor Fellowship
1992-1997 Elizabeth Cavert Miller (WARF) Professor
1992- Steenbock Professor of Microbiological Sciences
1998 Elected to American Academy of Microbiology
1998 Elected to National Academy of Sciences
2000 Elected to American Academy of Arts and Sciences
2007 Elected as Fellow of American Association for the Advancement of Science (AAAS)

FEDERAL SERVICE:

1986-1990 NIH Genetics Study Section
1994-1998 Frederick Cancer Center Scientific Advisory Board
2009 NIH Pioneer Award, Reviewer
2010-11 NIH New Innovator Award, Reviewer
SELECTED PUBLICATIONS SINCE 1999:
Sondheimer,N, Lopez N, Craig EA and Linquist S (2001) The role of Sis1 in the maintenance of the [RNQ+] prion. EMBO J. 20:2435-42. PMCID: PMC125465


Kim S-Y and Craig EA (2004) Broad sensitivity of Saccharomyces cerevisiae lacking ribosome-associated chaperones Ssb or Zuo1 to cations, including aminoglycosides. Eukaryotic Cell. 4:82-89. PMCID: PMC544168


Research Support:

ONGOING

"Functional Diversity of J-protein Components of Hsp70 Chaperone Machinery" Principal Investigator: Elizabeth A. Craig
NIH 5 R01 GM31107-29; 7/1/09-6/30/13; Role: PI
The long-term goal of this project is to understand the diversity of J-proteins, particularly the role of ribosome-associated molecular chaperones in the early steps of protein folding and molecular chaperones in the propagation of yeast prions.

"Roles of Molecular Chaperones in Mitochondrial Function " Principal Investigator: Elizabeth A. Craig
NIH 5 RO1 GM27870-31; 5/1/09-3/31/13; Role: PI
The long-term goal of this grant is to understand the roles of molecular chaperones in mitochondria, particularly in translocation of proteins across the inner membrane and Fe-S cluster biosynthesis.
I am PI of the UW Transmembrane Protein Center and Co-leader of the Deconstruction group of the Great Lakes Bioenergy Research Center. I lead efforts to develop methods to identify, clone, express, and produce proteins for diverse studies. We have developed methods that yield many different types of proteins in amounts and purity suitable for functional studies and structure determination. Many of our projects include collaborations with scientists from leading institutions around the world. Our scope of work includes multiprotein metalloenzyme complexes, integral membrane proteins, and genome-wide characterizations of the cellulolytic capacity of novel microbes. Recent publications summarizing this work are provided below.

B. Positions and Honors.

Professional Experience:
1981 Laboratory Technician, University of Minnesota, Chemistry Department, employer M.T. Stankovich
1984 Graduate Study, University of Minnesota, Biochemistry Department, advisor J.D. Lipscomb
1989 Postdoctoral Study, University of Minnesota, advisor J.D. Lipscomb
1990 Postdoctoral Study, Carnegie Mellon University, Chemistry Department, advisor E. Münck
1993 Assistant Professor, University of Wisconsin-Madison, Biochemistry and Enzyme Institute
1998 Associate Professor, University of Wisconsin-Madison, Biochemistry and Enzyme Institute
2001 Marvin J. Johnson Professor of Fermentation Biochemistry, University of Wisconsin.
2002 Professor, University of Wisconsin-Madison, Biochemistry

Federal Government Public Advisory Committees:
June 2005-2010 Member, NIH Molecular Structure and Function A
October 2005-present Reviewer, NSF Biodirectorate

Honors and Awards:
1980 Undergraduate Research Opportunity Fellowship, National Science Foundation
1985 Pre-Doctoral Training Grant Fellowship, U.S. Public Health Service
1988 Doctoral Dissertation Fellowship, University of Minnesota Graduate School
1989 Bachaner Award for Outstanding Performance in Dissertation Research
1994 Searle Scholar, Chicago Community Trust
1994 Shaw Scientist, Milwaukee Foundation
1997 Glenn S. Pound Research Award, University of Wisconsin College of Agricultural and Life Sciences
1997 Early Career Development Award, National Science Foundation
1999 Dupont Educational Aid Grants in Science and Education
2002 H. I. Romnes Fellowship, University of Wisconsin
2008 Vilas Faculty Recruitment and Retention Award, University of Wisconsin.
2009 Vilas Associate, University of Wisconsin
C. Selected peer-reviewed publications (from 176 peer-reviewed publications)


D. Research Support.

Ongoing

Centers for Membrane Protein Structure Determination (U54). NIH/NIGMS, 1 U54 GM094584-01. B. G. Fox, Pl. J. L. Markley and G. N. J. Phillips, Co-Pls. Project period 07/01/10 to 06/30/15. Total award, $5,512,500. Goal: The goal is to establish a large-scale center for the production and structural analysis of integral membrane proteins.

Partnership for High-Throughput Enabled Biology of the Mitochondrial Proteome. NIH/NIGMS, 1U01GM094622-01, pending J. L. Markley, Pl. D. Pagliarini, B. G. Fox and G. N. Phillips Jr, Co-Pls. Project period 07/01/10-06/30/15. Total award, $1,619,321 Goal: The goals of this project are to promote structure-function investigations of mitochondrial proteins under the aegis of the Protein Structure Initiative (PSI: Biology).

Enzyme Discovery for Natural Product Biosynthesis. NIH/NIGMS, 1U01 GM094596-01, pending. G. N. Phillips, Jr., Pl. B. G. Fox and J. L. Markley, Co-Pls. Project period 09/30/2011- 08/31/2015. Total award, $$3,145,710. Goal: The goals of this project are to accelerate the discovery and structural-functional characterization of enzymes that can be used to create new drug candidates through partnership with PSI: Biology.

PD-04-1144 (Fox) 12/01/2008 – 11/30/2013 1.2 calendar
NSF, MCB-0843239 B. G. Fox, Pl. Project period 12/01/08 - 11/30/13. Total award, $1,800,000. Protein-Protein Interaction Surfaces in Diiron Enzymes

Aim 1 of the research is to determine crystal structures of two new types of protein-protein complexes. Aim 2 is to evaluate the hypothesis that effector protein binding induces a quasi-stable conformational change in the hydroxylase. Aim 3 is to use rapid kinetic and spectroscopic approaches to investigate the role of protein-protein interactions in the formation and reactivity of a putative peroxodiferric species.

DE-FC02-07ER64494 (Donohue) 12/01/2009 – 11/30/2010 .24 calendar
DOE $403,000
Great Lakes Bioenergy Research Center

The goal of this subcontract is development of high-throughput systems to identify combinations of cellulose destruction enzymes from natural and synthetic sources.

T32GM008349 (Fox) 09/27/1989 – 06/30/2009 .60 calendar
NIH/NIGMS $1,334,700
Biotechnology Training Program

The goal of this grant is cross-disciplinary training of 30 PhD students in biophysical and biological research.

(No project number) (BG Fox, PI) 07/011 - 06/12
Elanco Animal Health
Evaluation of enzymes for biomass modification.

Aim is to develop new enzymology approaches for specified applications.

Pending
Completed (last 3 years)

1 U54 GM074901-04 (Markley) 07/01/2005 – 06/30/2010 3.6 calendar
NIH/NIGMS $2,622,053
Specialized Center for Eukaryotic Structural Genomics
The project is to operate a specialized center under Phase-II of the Protein Structure Initiative. Fox has leadership roles in development and execution of cloning, expression, and purification methods. Project milestones and spending are reviewed on a quarterly basis by NIH staff.

MCB 0316232 (BG Fox, PI) 09/03 - 08/10
NSF
Mechanism of Action in Engineered Isoforms of Toluene 4-Monooxygenase Complex
Aim I is to apply mutagenesis and protein evolution to the toluene-4-monooxygenase complex in order to create new diiron enzyme reactivities. Aim II includes the use of catalytic and spectroscopic approaches to assess the results of the protein engineering efforts. Aim III is to determine structures of the protein components of the complex.

(No project number) (BG Fox, PI) 11/06 - 10/08
Promega Corporation
Flexi Vector Technology Development
Aim is to test and modify commercial expression vectors to allow high-throughput cloning suitable for support of both cell-based and cell-free protein expression. Provides funding and staffing for vector development relevant to the current proposal. No overlap with current proposal.
BIOGRAPHICAL SKETCH

NAME
FRIESEN, Paul D.

eRA COMMONS USER NAME
pfriesen

POSITION TITLE
Professor of Molecular Virology & Biochemistry

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Kansas (Lawrence, KS)</td>
<td>B.A.</td>
<td>1977</td>
<td>Biochem &amp; Chemistry</td>
</tr>
<tr>
<td>University of Wisconsin (Madison, WI)</td>
<td>Ph.D.</td>
<td>1983</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>University of Idaho (Moscow, ID)</td>
<td>Postdoc.</td>
<td>1983-1985</td>
<td>Biochemistry</td>
</tr>
</tbody>
</table>

A. Positions and Honors

Positions and Employment:

1983-1986 NIH Postdoctoral Fellow, Dept. of Biochemistry and Bacteriology (w/ Lois Miller), Univ. of Idaho
1986-1988 Assistant Professor, Dept. of Biochemistry and Bacteriology, Univ. of Idaho
1989-1993 Assistant Professor, Dept. of Biochemistry and Institute for Molecular Virology, U.W.-Madison
1993-1998 Associate Professor, Dept. of Biochemistry and Institute for Molecular Virology, U.W.-Madison
1998-on Professor, Dept. of Biochemistry and Institute for Molecular Virology, U.W.-Madison

Honors:

- Phi Beta Kappa; Summa Cum Laude, 1977
- University of Kansas - Honors in Chemistry and Biochemistry, 1977
- State of Idaho Research Development Award, 1988
- Steenbock Career Development Award, U.W.-Madison
- 1996 College of Agriculture & Life Sciences Pound Research Award, U.W.-Madison
- 1997 Romnes Faculty Fellowship Award, Graduate School, U.W.-Madison
- 1998 College of Agriculture & Life Sciences Spitzer Excellence in Teaching Award, U.W.-Madison
- American Society for Virology Council (Insect Virology), 2000 to 2003
- Local Host, American Society for Virology Annual Meeting – July, 2006 (Madison, WI)
- 2009-2010 University of Wisconsin-Madison Vilas Associate Award

Professional Activities:

- Member of the American Society for Virology
- Member of the American Society for Microbiology
- Member of the Editorial Board of the Journal of Virology (1998-2007)

B. Selected Peer-reviewed publications (selected from a total of ~65 peer-reviewed publications)


C. Research Support.

2R56AI040482-11 Friesen (PI)
NIH/NIAID, "Regulation of Virus-induced Programmed Cell Death "; $290,000 per year (w/ IC)

University of Wisconsin-Madison Vilas Associate Award
BIOGRAPHICAL SKETCH

NAME
Hayes, Colleen E.

POSITION TITLE
Professor

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>DePauw Univ., Greencastle, IN</td>
<td>B.A.</td>
<td>1965-1969</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Univ. of Michigan, Ann Arbor, MI</td>
<td>Ph.D.</td>
<td>1969-1973</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Harvard Univ., Boston, MA</td>
<td>Postdoc</td>
<td>1975-1977</td>
<td>Immunobiology</td>
</tr>
</tbody>
</table>

A. Positions and Honors

Employment

1979-84 Assist. Prof. of Biochemistry, U. of Wisconsin-Madison
1984-89 Assoc. Prof. of Biochemistry, U. of Wisconsin-Madison
1987 Sabbatical Research in Molecular Biology with Dr. Michael Steinmetz
Basel Institute for Immunology and Hoffman-La Roche, Basel, Switzerland
1990-present Professor of Biochemistry, U. of Wisconsin-Madison

Other Experience and Professional Memberships

1977-present Member, American Association of Immunologists
1977-present Member, American Association for the Advancement of Science
1988-1993 Member, National Institutes of Allergy and Infectious Diseases, Study Section SSS-4
1994-2001 Chair, National Institutes of Allergy and Infectious Diseases, Study Section SSS-4
2001 Member; National Institutes of Allergy and Infectious Diseases, Special Study Section for Sex and Gender Factors in the Immune Response
2001 Member, Dept of Defense, Breast Cancer Res. Program, Cell Biology Study Section
2002-2004 Chair, Dept of Defense, Breast Cancer Res. Program, Cell Biology Study Section
2003-2008 Member; National Multiple Sclerosis Society, Scientific Peer Review Panel A
2009-present Member; Department of Defense Medical Science Research Program, Integration Panel for Multiple Sclerosis research

Honors

1965-69 McMahan Scholar, DePauw University
1969 Phi Beta Kappa, Sigma Pi Sigma Scholastic Honorary Societies
1969-71 National Science Foundation Predoctoral Fellow
1971-73 American Cancer Society Predoctoral Fellow
1973 Sigma Xi Scientific Honorary Society
1975-78 Helen Hay Whitney Postdoctoral Research Fellow
1978-81 National Foundation March of Dimes Basil O'Connor Fellow
1983-88 Leukemia Society of America Scholar
1987-91 Romnes Fellowship
B. Peer-reviewed publications since 2001


C. Research Support

National Multiple Sclerosis Society
RG4076AS/1; Hayes (PI, 10%) 10/01/09-09/30/12 $485,469
“Calcitriol synthesis and IL-10-dependent function in the central nervous system”
This research aims to understand why a functional IL-10-IL-10R pathway is essential for calcitriol inhibition of EAE. The hypothesis is that calcitriol up-regulates the IL-10-IL-10R pathway, the IL-10-IL-10R pathway performs anti-inflammatory functions, and the IL-10-IL-10R pathway subsequently terminates the accumulation of calcitriol. The goals of this proposal are to investigate (aim 1) kinetics of Cyp27b1 gene expression and feed-back inhibition of Cyp27b1 in the CNS of mice with EAE; (aim 2) the impact of calcitriol on IL-10R expression and the effects of IL-10R expression on calcitriol synthesis in the CNS; (aim 3) the impact of calcitriol on IL-10-producing T regulatory cells in the CNS and hematopoietic tissues of mice with EAE.

HATCH McIntyre Stennis Award (MSN119798)
PRJ18KV Hayes (PI, 5%) 10/1/08 – 9/30/12 $110,452
“Vitamin D metabolism in the CNS and regulation of the IL-10 receptor”
This research aims to understand why a functional IL-10-IL-10R pathway is essential for calcitriol inhibition of EAE. The goals of this proposal are to induce EAE in B6 mice with genetically encoded fluorescent labels on macrophages, microglia, astrocytes, T lymphocytes, or neurons, and to evaluate each cell type for cell type-specific expression of Cyp27b1, Cyp24a1, VDR, IL-10, and IL-10R using FACS, PCR, and immunohistochemical methods and to determine the impact of vitamin D nutrition on CNS expression of these vitamin D and immune system components by the cells of interest.

National Multiple Sclerosis Society
RG 3107-D-6; Hayes (PI, 10%) 10/01/2009-09/30/2012 $392,048
“Vitamin D and estrogen synergy in the control of EAE”
The goal of this project is to investigate the relationship between the vitamin D and estrogen (E) endocrine systems in protection from autoimmune disease. The Aim 1 experiments test the hypothesis that E enhances 1,25-dihydroxyvitamin D3 synthesis and protective function in the inflamed central nervous system (CNS) through molecular analysis of how E down-regulates Cyp24a1 transcription in the CNS and in immune system cells during mouse multiple sclerosis. The Aim 2 experiments test the hypothesis that E protective functions in the inflamed CNS depend on enhancement of VDR gene transcription through analysis of E-mediated protection from autoimmune CNS inflammation in mice with cell type specific inactivation of the VDR gene.

University of Wisconsin Foundation
Hayes (PI) 07/20/2009-indefinite $40,000
“Multiple Sclerosis Research Fund in Biochemistry”
The goal of this project is to investigate the etiology of multiple sclerosis in the anticipation of one day preventing this debilitating disease.

Pending Applications

National Multiple Sclerosis Society
“Epigenetic regulation of vitamin D catabolism by estrogen in the immune system”
Nelson, Corwin (postdoctoral fellow applicant)
Hayes, Colleen (sponsor)
BIOGRAPHICAL SKETCH

NAME
Holden, Hazel Marguerite

POSITION TITLE
Professor of Biochemistry

eRA COMMONS USER NAME (credential, e.g., agency login)
hmholden

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duke University, Durham, North Carolina</td>
<td>A. B.</td>
<td>5/77</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Washington University, St. Louis, Missouri</td>
<td>Ph. D.</td>
<td>6/82</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Washington University, St. Louis, Missouri</td>
<td>Postdoctoral</td>
<td>6/82-12/82</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Brandeis University, Waltham, Massachusetts</td>
<td>Postdoctoral</td>
<td>1/83-6/84</td>
<td>Structural Biology</td>
</tr>
<tr>
<td>University of Oregon, Eugene, Oregon</td>
<td>Postdoctoral</td>
<td>6/84-9/85</td>
<td>X-ray Crystallography</td>
</tr>
</tbody>
</table>

A. Personal Statement

My laboratory studies the structures and functions of enzymes and proteins by single crystal X-ray diffraction analysis. Through the efforts of my laboratory, 205 x-ray data sets have now been deposited into the Protein Data Bank. Some of the structures determined were quite small whereas others were very large such as carbamoyl phosphate synthetase. Many of these structures, including myosin subfragment-1, now appear in major biochemistry textbooks, and, indeed, my laboratory solved the first structure of an a polipoprotein (Biochemistry, 1991, 30, 603). The goal of my present research is aimed at understanding the structures and functions of the enzymes involved in the biosynthesis of unusual di- and trideoxyhexoses. These sugars are found in the O-antigens of Gram-negative bacteria. O-antigens differ among bacteria with respect to sugar content and linkages, are highly immunogenic, and serve as important virulence factors. General approaches utilized in my laboratory include X-ray crystallography, site-directed mutagenesis, enzymatic synthesis of appropriate nucleotide-linked sugar ligands, and kinetic analyses. I have considerable experience in all of these techniques.

B. Positions and Honors

Research Assistant Professor, Department of Biochemistry, University of Arizona, Tucson, AZ 9/85-6/88
Assistant Professor, Department of Chemistry, University of Wisconsin, Madison, WI 7/88-9/92
Assistant Professor, Department of Biochemistry, University of Wisconsin, Madison, WI 10/92-6/93
Associate Professor, Department of Biochemistry, University of Wisconsin, Madison, WI 7/93-6/97
Professor, Department of Biochemistry, University of Wisconsin, Madison, WI 7/97-present

Margaret Oakley Dayhoff Award, 1991/1992
WARF Romnes Faculty Fellowship, 1994/1995
Kellett Mid-Career Award, 2010/2011

C. Selected Peer-reviewed Publications (out of 171)


**D. Research Support**

**ACTIVE**

5R01 DK047814-14  Holden (PI)  2/1/11-1/31/15
NIH

X-ray Studies of Sugar-Modifying Enzymes

The goal of the project is to study the structure and function of enzymes involved in biosynthesis of unusual di- and trideoxysugars found on bacterial lipopolysaccharides.

5R01 GM087467 Firestine (PI) 4/1/09-3/31/14

NIH

Enzymology of N^6-CAIR Synthetase

The goal of the project is to explore the possibility of using enzymes involved in de novo purine biosynthesis as targets for antimicrobial drug design.

MCB-0849274 Holden (PI) 4/1/09-3/31/12

NSF

Enzymes Required for the Biosynthesis of Deoxysugars Decorating Aglycone Scaffolds

The goal of the project is to study the structure and function of enzymes involved in the biosynthesis of unusual di- and trideoxysugars found attached to aglycone scaffolds. The grant also has a considerable outreach component with the development of Project CRYSTAL, a program designed to introduce chemistry and laboratory research to middle school students (http://www.projectcrystal.org/)
BIOGRAPHICAL SKETCH

NAME
Aaron Andrew Hoskins

POSITION TITLE
Assistant Professor of Biochemistry

eRA COMMONS USER NAME (credential, e.g., agency login)
HoskinsPI

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purdue University, West Lafayette, IN</td>
<td>B.S.</td>
<td>08/96-05/00</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Massachusetts Institute of Technology, Cambridge, MA</td>
<td>Ph.D.</td>
<td>08/00-04/06</td>
<td>Biological Chemistry</td>
</tr>
<tr>
<td>Brandeis University, Waltham, MA</td>
<td></td>
<td>04/06-08/07</td>
<td>Biological Chemistry</td>
</tr>
<tr>
<td>U. Massachusetts Medical School, Worcester, MA</td>
<td></td>
<td>09/07-06/11</td>
<td>Biological Chemistry</td>
</tr>
</tbody>
</table>

Please refer to the application instructions in order to complete sections A, B, C, and D of the Biographical Sketch.

A. Personal Statement

My laboratory is interested in the general question of how biomolecular machines such as the spliceosome assemble into functional enzymes. The spliceosome catalyzes an essential step in eukaryotic gene expression: the splicing of pre-mRNAs to mRNAs. Central to spliceosome assembly is the correct choice of splice sites (the locations of chemistry) on the pre-mRNA. Recognition of these locations is critical for production of the correct mRNA isoform by alternative splicing, and errors in this process can lead to many diseases including cancer.

Using a single molecule approach, my laboratory visualizes how cooperative ligand interactions promote U1 snRNP association with pre-mRNA and how auxiliary proteins can influence spliceosome assembly. This provides new kinetic and thermodynamic information into splice site selection, a necessary prerequisite for understanding the biochemistry behind alternative splicing in humans. Unlike U1 interactions, selection of the correct branchsite by U2 requires ATP hydrolysis by the Prp5 DEADbox ATPase. In collaboration with Charles Query (Albert Einstein College of Medicine), my laboratory is uncovering the biochemical rationale for the action of Prp5 by monitoring branchsite selection using single molecule methods. This work will provide a paradigm for understanding how ATP hydrolysis can be coupled to splice site recognition in all organisms.

B. Positions and Honors

Positions
Graduate Student, Massachusetts Institute of Technology
Advisor: Professor JoAnne Stubbe
Department of Chemistry

Fellowships: NSF predoctoral fellowship
Apr. 2006-Aug. 2007
Postdoctoral Fellow, Brandeis University
Advisor: Professor Melissa J. Moore
Department of Biochemistry

Fellowships: NIH NRSA Postdoctoral Fellowship (F32 GM 079971) (Feb. 2007-Aug. 2007)

Sept. 2007-June 30, 2011
Postdoctoral Fellow, U. Massachusetts Medical School
Advisor: Professor Melissa J. Moore
Biochemistry and Molecular Pharmacology

Fellowships: NIH NRSA Postdoctoral Fellowship (F32 GM 079971) (Sept. 2007-Nov. 2008)
NIH K99/R00 Career Transition Award (K99 GM086471) (Dec. 2008-Present)

July 25, 2011-
Assistant Professor University of Wisconsin-Madison
Department of Biochemistry

Honors
1996 Great Lakes Chemical Chemistry Scholarship
1997 Phi Eta Sigma Honor Society
1998 Golden Key National Honor Society
1999 ACS Travel Award
1999 Ben Freiser Memorial Award in Analytical Chemistry
1999-2000 Mortar Board
1999 Phi Beta Kappa
1996-2000 Eli Lilly-Purdue Alumni Scholar at Purdue University (full scholarship)
1996-2000 Dean’s List for all semesters
2000 Graduate of Purdue University with Highest Honors in Chemistry Honors Program
2000 Hyper Cube Chemistry Scholar Award
2000 Carroll County Cancer Society Research Fellowship, Purdue Cancer Center
2000 Outstanding Teaching Assistant for Chemistry 5.32 (MIT)
2000-2003 NSF Predoctoral Fellowship
2007-2008 NIH NRSA Postdoctoral Fellowship
2008-Present NIH K99/R00 Career Transition Award

Professional Societies
American Chemical Society
Biophysical Society
RNA Society
Genetics Society of America

C. Peer-reviewed publications (in chronological order).

Most Relevant to this Application


D. Research Support

Ongoing Research Support
NIH R00 GM086471-“Mechanisms of Spliceosome Assembly and Splice Site Selection”
Project Period: 09/01/2011-08/01/2014
Principal Investigator: Aaron A. Hoskins
Current Year Direct Costs: $214,177
Total Cost (All Years): $747,000
Completed Research Support

NIH F32GM079971– "Single Molecule Flourescence Studies on DExD/H-box Protein:Spliceosome Complexes"
Project period: 2/1/07-11/30/08
Principal Investigator: Aaron A. Hoskins

This NIH NRSA postdoctoral fellowship covered salary expenses for research carried out in the Moore and Gelles laboratories.

NIH K99 GM086471– "Single Molecule Analysis of Spliceosome Catalysis and Fidelity"
Project period: 12/1/08 – 6/30/11
Principal Investigator: Aaron A. Hoskins

This NIH career transition award has transitioned to the R00 phase.
BIOGRAPHICAL SKETCH

NAME
Laura L. Kiessling

POSITION TITLE
Emil Fischer and Hilldale Professor of Chemistry and Biochemistry
Laurens Anderson Professor of Biochemistry

eRA COMMONS USER NAME
llkiessl

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Massachusetts Institute of Technology</td>
<td>BS</td>
<td>1983</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Yale University</td>
<td>PhD</td>
<td>1989</td>
<td>Chemistry</td>
</tr>
<tr>
<td>California Institute of Technology</td>
<td>Postdoctoral</td>
<td>1989-1991</td>
<td>Chemical Biology</td>
</tr>
</tbody>
</table>

A. Personal Statement
My research interests focus on elucidating and exploiting the biological roles of oligosaccharides and oligosaccharide conjugates in biological systems. We are especially interested in multivalency and its role in cell surface recognition and signal transduction. Some recent contributions include developing cell surface arrays and using them to identify the most robust defined substrates for propagating human pluripotent stem cells. The research group also has been involved in illuminating the mechanisms underlying the biosynthesis of essential cell wall glycans in *Mycobacterium tuberculosis* and using this insight to identify new targets for antimycobacterial agents. I have extensive experience in mentoring graduate students (41 students have earned their PhD under my direction) and postdoctorates (25 have completed training under my direction). My former coworkers have gone on to successful industrial and academic careers.

B. Positions and Honors.
1983-1989 Research Assistant (S. L. Schreiber), Chemistry, Yale University, New Haven, CT
1991-1997 Assistant Professor of Chemistry, University of Wisconsin-Madison, WI
1997-1999 Associate Professor of Chemistry, University of Wisconsin-Madison, WI
1997-1999 Associate Professor of Biochemistry, University of Wisconsin-Madison, WI
1999-present Professor of Chemistry, University of Wisconsin-Madison, WI
1999-present Professor of Biochemistry, University of Wisconsin-Madison, WI
2002-present Director, Keck Center for Chemical Genomics, University of Wisconsin-Madison, WI
2002-present Director, NIH Chemistry Biology Interface Training Program, UW-Madison.

Service (partial list)
1992-present Member, Editorial Board, *Chemistry & Biology*
2000-2006 Member, Editorial Board, *Organic Reactions*
2001-present Section Head, Chemical Biology, Faculty of 1000
2001-present Member, Editorial Board, *The Journal of the American Chemical Society*
2002-2005 Member, Editorial Board, *Accounts of Chemical Research*
2003-2009 Member, Selection Committee, Alfred P. Sloan Foundation Fellowships
2005-present Member, Editorial Board, *Annual Reviews of Biochemistry*
2005-present Editor-in-Chief, *ACS Chemical Biology*

Honors (partial list)
Emil Fischer WARF Professorship (2011); Fellow of the American Chemical Society (2010); Guggenheim Fellowship (2009); Member, Wisconsin Academy of Sciences, Arts and Letters (2008); Member, National Academy of Sciences (2007); Member, American Academy of Microbiology (2007); Francis P. Garvan-John M. Olin Medal, American Chemical Society (ACS)(2006), Harrison-Howe Award, Rochester ACS (2005), Tetrahedron Young Investigator Award (2005), Fellow, American Academy of the Arts & Sciences (2003), Fellow, American Association for the Advancement of Science (2002); Carbohydrate Research Award (2001); Romnes Faculty Fellow (2001); Horace Isbell Award, Carbohydrate Division ACS (2000); MacArthur
Foundation Fellowship (1999-04); Arthur C. Cope Scholar Award (1999); Alfred P. Sloan Foundation Fellow (1997-99); Camille Dreyfus Teacher-Scholar Award (1996-01); Zeneca Excellence in Chemistry Award (1996); American Cancer Society Junior Faculty Award (1995-97); Beckman Young Investigator Award (1994-1996); National Science Foundation National Young Investigator Award (1994-99); Shaw Scientist Award (1992-97); Procter and Gamble Exploratory Research Award (1992-95); Dow Chemicals New Faculty Award (1992); ACS Postdoctoral Fellowship (1989-91)

C. Selected Peer-Reviewed Publications (Selected from 110, listed in chronological order).


Research Support

Ongoing Projects

R01 GM049975-17 3/9/93-6/30/12 (Renewal Pending)
NIH/NIGMS
Glycopeptides and Non-Natural Variants: Probes of Carbohydrate Function
The major goals of this project are to use non-carbohydrate small molecule inhibitors for the lectin DC-SIGN to probe its role in pathogen recognition.
Role: PI

R01 GM055984-13 8/11/06-6/30/15
NIH/NIGMS
Multivalent Ligands as Effectors
The goal of the proposed studies is to understand how cells control their responses to stimuli in the environment and to develop ligands that can regulate these responses. We hypothesize that signal amplification and integration in bacterial and neutrophil chemotaxis is achieved by receptor clustering. Synthetic multivalent ligands will be generated to test this hypothesis. This proposal is to renew this grant.
Role: PI

T32 GM08505-18 7/1/10-6/30/14
NIH/NIGMS
Chemistry – Biology Interface Training Program
The objective of this project is to provide pre-doctoral students with training at the interface of chemistry and biology.
Role: PI and Training Program Director

R01 AI55258-07 4/4/2003–11/30/13
NIH/NIAID
Synthetic Ligands for Modulating B Cell Responses
The long-term goals of the research are to use synthetic ligands to investigate how the organization of proteins on the B cell surface influences signaling and to develop a general strategy to modulate specifically the output responses of B cell clones.
Role: PI

R01 AI63596-06 3/15/05-12/31/14
NIAID
The Chemistry and Biology of Galactofuranose Residues
The major goals of this research project are to understand and inhibit two enzymes involved in the biosynthesis of glycoconjugates containing galactofuranose (Galf) residues: the flavoenzyme UDP-galactopyranose mutase (UGM) and the putative galactofuranosyltransferase (GIFT). Both UGM and GIFT are involved in mycobacterial cell wall biosynthesis, and the genes encoding these proteins are essential for the viability of Mycobacterium tuberculosis, the causative agent of tuberculosis.
Role: PI

Completed Projects

W81XWH-08-1-0648 9/15/08-10/14/11
DOD Army
Ovarian Cancer Immunotherapy Using Redirected Endogenous Anti-Gal Antibody
The focus of the project is on pursuing critical preclinical-translational steps in the development of a unique approach for ovarian cancer treatment. We anticipate that decorating ovarian tumor cells with αGal (using RGD*-αGal) will lead to their destruction by patients’ naturally occurring antibody against αGal (anti-Gal) and induce protective T cell immunity. The aims are directed at testing this approach in an in vivo mouse model.
Role: Co-PI
BIOGRAPHICAL SKETCH

NAME
Judith Kimble

POSITION TITLE
Vilas Professor and HHMI Investigator

eRA COMMONS USER NAME (credential, e.g., agency login)
JEKIMBLE

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of California, Berkeley</td>
<td>A.B.</td>
<td>08/71</td>
<td>Independent major</td>
</tr>
<tr>
<td>University of Colorado, Boulder</td>
<td>Ph.D.</td>
<td>08/78</td>
<td>Molecular, Cellular and Developmental Biology</td>
</tr>
<tr>
<td>MRC, Cambridge, England</td>
<td>Postdoctoral</td>
<td>12/82</td>
<td>Molecular Biology</td>
</tr>
</tbody>
</table>

A. Personal Statement
Kimble addresses regulation of stem cell self-renewal and differentiation, using the nematode *C. elegans* as a model. Her laboratory is expert in the genetics, genomics, cell biology and molecular manipulation of germline fate decisions.

B. Positions and Honors

Professional Experience
1971-1973 Videnskabige Assistant, University of Copenhagen Medical School
1978-1982 Postdoctoral Fellow, MRC Laboratory of Molecular Biology, Cambridge, England
1983-1988 Asst. Professor, joint in Lab of Molecular Biology and Dept. of Biochemistry, UW-Madison
1988-1992 Assoc. Professor, joint in Lab of Molecular Biology and Dept. of Biochemistry, UW-Madison
1992- Professor, joint in Lab of Molecular Biology and Dept. of Biochemistry, UW-Madison
1993- Professor, Department of Medical Genetics, University of Wisconsin-Madison
1994- Investigator, Howard Hughes Medical Institute
2009-2011 Adjunct Professor, National Institute of Genetics, Mishima, Japan

Honors
1974-1977 NSF Predoctoral Fellow, University of Colorado, Boulder
1978-1980 Jane Coffin Childs Postdoctoral Fellow
1980-1982 NIH Postdoctoral Fellow
1984-1989 NIH Research Career Development Award
1988 Pound Award for Excellence in Research, University of Wisconsin-Madison
1990 Romnes Faculty Fellowship, University of Wisconsin-Madison
1995 Membership, American Academy of Arts and Sciences
1995 Mid-Career Award, University of Wisconsin-Madison
1995 Membership, National Academy of Sciences
2000 President, Genetics Society of America
2001 Vilas Professorship
2002 Membership, American Philosophical Society
2004-2005 President, Society for Developmental Biology
2005 Fellow, American Association for the Advancement of Science
2008-2011 Council, National Academy of Sciences
2009-2011 Adjunct Professor, National Institute of Genetics, Mishima, Japan
2009- Committee on Science, Engineering and Public Policy (COSEPUP)
Patent applications

C. Selected Peer-reviewed Publications (selected, out of 165 total)


Snow, J. J., Lee, M.-H., Kroll-Conner Peggy L. and J. Kimble  FOG-3/Tob can either promote or inhibit proliferation in the *Caenorhabditis elegans* germline. (submitted)


D. Research Support

**Ongoing Research Support**

Investigator Award (Kimble) 5/18/1994-present
Howard Hughes Medical Institute
Total amount and duration not yet determined.

This award supports the PI’s program to analyze Notch signaling, environmental impact analyses, genomic phosphoproteomics and chemical reprogramming studies.

Vilas Professorship (Kimble) 7/1/2001–6/30/2012
Vilas Trust, administered by UW-Madison
Research Professorship

This award supports the PI’s research program by providing support for one graduate student.

R01 GM069454 (Kimble) 2/01/04-12/31/2012
Regulation of germline proliferation and differentiation

The long-term objective of the research is to dissect the molecular controls of germline growth and differentiation during metazoan development. Specifically we focus on how the germ line is controlled to divide mitotically and maintain stem cells or to enter the meiotic cell cycle and differentiate as sperm or oocyte.
BIOGRAPHICAL SKETCH

NAME
LANDICK, Robert

POSITION TITLE
Charles Yanofsky Professor of Biochemistry & Bacteriology, Univ. of Wisconsin-Madison

eRA COMMONS USER NAME NAME (credential, e.g., agency login)
rlandick

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Michigan, Ann Arbor, MI</td>
<td>B.S.</td>
<td>05/75</td>
<td>Chemistry</td>
</tr>
<tr>
<td>University of Michigan, Ann Arbor, MI</td>
<td>Ph.D.</td>
<td>03/83</td>
<td>Biological Chemistry</td>
</tr>
<tr>
<td>Stanford University, Stanford CA</td>
<td>Postdoctoral</td>
<td>04/83-10/86</td>
<td>Molecular Biology</td>
</tr>
</tbody>
</table>

A. Personal Statement

My training and expertise are in biochemistry and molecular biology. My lab group has studied RNA polymerase and transcription complex structure/function since I assumed a faculty position 24 years ago. Our contributions include elucidating the mechanism by which nascent RNA hairpins stabilize paused transcription complexes (e.g., Toulokhonov et al., 2001), establishing mechanisms of transcriptional pausing and termination using a single-molecule assay (e.g., Neuman et al., 2003; Toll-Nørrelykke et al., 2004; Dalal et al., 2005; Larson et al., 2008), determining the mechanisms of RNA polymerase inhibitors and elongation regulators (e.g., Artsimovich and Landick, 2002; Artsimovich et al., 2003; Mooney et al., 2009b; Ha et al., 2010; Hein et al., 2011), and showing that the catalytic cycle of RNA polymerase depends on conformational fluctuations of the polymorphous trigger loop as well as characterizing the role of the trigger loop in nucleotide addition, transcriptional pausing, and nascent RNA cleavage (e.g., Vassylyev et al., 2007; Toulokhonov et al., 2007; Zhang et al., 2010). We also developed the first single-molecule transcription assay (Schafer et al., 1991) and the first methods to assemble recombinant bacterial RNA polymerases in vivo. My expertise is evidenced by my role as organizer of several conferences on transcriptional regulation and by appointment to the editorial boards of Mol. Cell and Transcription.

B. Positions and Honors

Positions and Employment

| 1983-1986 | NIH Postdoctoral Fellow with Dr. Charles Yanofsky, Dept. of Biological Sciences, Stanford University, Stanford, CA. |
| 1987-1991 | Assistant Professor and Mallinckrodt Fellow, Department of Biology, Washington University, St. Louis, MO. |
| 1987-1995 | Assistant Professor, Department of Biochemistry and Molecular Biophysics, Washington University, St. Louis, MO. |
| 1991-1995 | Associate Professor, Department of Biology, Washington University, St. Louis, MO. |
| 1992-1993 | Visiting Scientist, Stanford University, Stanford, CA. |
| 1995      | Professor, Department of Biology, Washington University, St. Louis, MO. |
| 1996-present | Professor, Department of Bacteriology, University of Wisconsin, Madison, WI. |
| 2001-present | Adjunct Faculty, Rockefeller University, New York, NY. |
| 2007-present | Professor, Department of Biochemistry, University of Wisconsin, Madison, WI. |

Other Experience and Professional Memberships

| 1979-      | American Society for Microbiology, member |
| 1983-      | DNA and Cell Biology Editorial board, Member |
| 1984-      | American Association for the Advancement of Science, member |
| 1991-      | American Society for Biochemistry and Molecular Biology, member |
| 1993       | NIH Microbial Physiology and Genetics Study Section, ad hoc reviewer |
| 1994-98    | NIH Microbial Physiology and Genetics Study Section, member (Chair 1996-1998) |
| 2000       | Cell Development and Function Study Section, ad hoc reviewer |
| 2001       | NCI Gene Regulation and Chromosome Biology Lab Review Panel, ad hoc reviewer |
2001-03 Molecular Genetics of Bacteria and Phage Meeting, Organizer
2002- Molecular Cell Editorial Board, Member
2002 NIH Infectious Disease and Microbiology Study Section Boundaries Team, member
2003 NCI Laboratory of Molecular Biology Review Panel, ad hoc reviewer
2004 NSF Molecular and Cellular Biology Review Panel, ad hoc reviewer
2004 FASEB Nucleic Acid Enzymes Conference, organizer
2006 Keystone Nucleic Acid Enzymes Conference, organizer
2006 Molecular Genetics A Study Section, ad hoc reviewer
2006 NIGMS Advisory Council, ad hoc reviewer
2006-08 NIGMS Pathways to Independence Award Study Section, ad hoc reviewer
2008 NHLBI Board of Scientific Counselors, ad hoc reviewer
2006-09 NIH EcoCyc Steering Committee, ‘06-’09 Chair
2008- NIH EcoCyc Steering Committee, Member
2008 Prokaryotic Cell and Molecular Biology Study Section, ad hoc reviewer
2009-13 FASEB Prokaryotic Transcription Mechanisms Conference, organizer
2009 NIH Special Emphasis Panel, ad hoc reviewer
2009- Transcription Editorial Board, Member
2009 NSF Molecular and Cellular Biology Review Panel, ad hoc reviewer
2010 Prokaryotic Cell and Molecular Biology Study Section, ad hoc reviewer

Honors
1970 James B. Angell Scholar
1975 B.S. with honors, University of Michigan
1978 Horace H. Rackham Graduate Fellowship
1981 Horace H. Rackham Predoctoral Fellowship
1982 Horace H. Rackham Dissertation Research Grant
1983-86 NIH Postdoctoral Fellowship
1987-91 Mallinckrodt Fellow
1987-92 Searle Scholar
1989-95 Presidential Young Investigator
2001- NIH Merit Awardee
2003- Fellow, American Academy of Microbiology
2004- Fellow, American Association for the Advancement of Science
2006 Division H Lecturer, American Society of Microbiology
2006-07 Ira L. Baldwin Professor of Bacteriology
2006- UW Madison Kellett Faculty Fellowship
2010- Charles Yanofsky Professor of Biochemistry & Bacteriology; WARF Named Professorship

C. Selected Peer-reviewed Publications (of 140 total)


Ha, K. S., Toulokhonov, I., Vassylyev, D. G. & Landick, R. 2010. The NusA N-terminal domain is necessary and sufficient for enhancement of transcriptional pausing via interaction with the RNA exit channel of RNA polymerase. *J Mol Biol* 401, 708-25. PMcid in process. PMID20600118


D. Research Support

ONGOING

R37 GM038660-25 Landick (PI) 7/1/11-6/30/15
NIH/NIGMS Structure/Function of Transcription Complex Regulation
The major goals are to understand how nucleic acids and regulators interact with transcription complexes to control transcript elongation. This is the grant for which renewal is sought in this proposal. It will constitute the only extramural source of support for work on transcription complex regulation in my lab after Spring, 2011.

DE-FC-07ER64494-03 T. Donohue (PI) 10/1/07-11/30/12
DOE Great Lakes Bioenergy Research Center
The major goals of this project are to create a Bioenergy Research Center that is shared between the University of Wisconsin and Michigan State University. My main role in the project is administrative, in which I oversee a microbial engineering research program conducted principally by other project leaders. In addition, I supervise one postdoctoral trainee in my lab studying the mechanism of type II protein secretion as part of the project.

COMPLETED

MCB 0640642 Kiley, Landick, & Ansari (co-PIs) 3/1/07-2/28/11
NSF/MCB Genome-wide changes in bacterial transcription units as a function of oxygen limitation
This was a collaborative project to use genome-scale methods to understand anaerobic gene regulation in bacteria.

WIS0422 Landick (PI) 10/1/06-9/30/10
USDA Recombinant Mycobacterial RNA polymerases for Functional Study and Inhibitor Screening
The major goals of this project were to develop methods for production of recombinant mycobacterial RNA polymerases using *E. coli* as a host and to use these recombinant RNA polymerases for functional studies.

R21 NS056937 Landick (PI) 7/1/06-6/30/09
NIH/NINDS High-Throughput Identification of RNA Polymerase Inhibitors in vivo
This project supported development of a high-throughput screen for bacterial RNA polymerase inhibitors.

R01 GM074252 Vassylyev, Univ. of Alabama at Birmingham (PI) 4/1/04-3/31/09
NIH/NIGMS Mechanisms of Transcription Elongation
The major goals for the small subcontract to UW-Madison were to characterize fragments of *T. thermophilus* NusA and NusG for crystallization with *T. thermophilus* RNA polymerase.
R01 GM074840 Vassylev, Univ. of Alabama at Birmingham (PI) 7/1/05-6/30/09
NIH/NIGMS Transcription Regulation Through RNAP Secondary Channel
The major goals of this subcontract were to test effects of Gre proteins on RNA polymerase mutants. My lab had a small subcontract to prepare proteins for use in crystallization experiments.

R01 GM072795-04 Landick (PI) 4/1/06-3/31/11
NIH/NIGMS Human RNAPII Structure/Function in Pausing & Elongation
The major goals of this project were to construct, isolate, and study mutant human RNAPII enzymes molecules.
BIOGRAPHICAL SKETCH

NAME
Markley, John L.

POSITION TITLE
Professor of Biochemistry

eRA COMMONS USER NAME (credential, e.g., agency login)
JMARKLEY

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carleton College</td>
<td>B.S.</td>
<td>06/63</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Harvard University</td>
<td>Ph.D.</td>
<td>05/69</td>
<td>Biophysics</td>
</tr>
<tr>
<td>University of California, Berkeley</td>
<td>Postdoctoral</td>
<td>08/70-01/72</td>
<td>Fourier transform NMR spectroscopy</td>
</tr>
</tbody>
</table>

A. Personal Statement

B. Positions and Honors

Positions and Employment
1967-1969  Senior Research Chemist, Department of Biophysics and Pharmacology, Merck Institute for Therapeutic Research, Rahway, NJ
1972-1976  Assistant Professor of Chemistry, Purdue University, West Lafayette, IN
1976-1981  Associate Professor, Department of Chemistry and Graduate Program in Biochemistry, Purdue University
1977-1984  Director, Purdue University Magnetic Resonance Laboratory
1981-1983  Professor, Department of Chemistry and Graduate Program in Biochemistry, Purdue
1982-1983  Head, Division of Biochemistry, Department of Chemistry, Purdue
1984-1986  Professor of Biochemistry, University of Wisconsin-Madison
1986-1988  Head, National Magnetic Resonance Facility at Madison
1988-1990  Chair, Graduate Program in Biophysics
2001-2004  Director Center for Eukaryotic Structural Genomics
2007-      Affiliate Member, Genome Center of Wisconsin

Other Experience and Professional Memberships
Advisory Board Member, eNMR, Project Funded by the EU
Advisory Board Member, Seattle Structural Genomics Center for Infectious Disease
Advisory Board Member, HWB-NMR Facility in Birmingham, UK
Advisory Board Member, Nebraska Center for Rapid Bioanalysis, University of Nebraska, Lincoln

Honors
1963 Carleton College: Honors in Chemistry, Phi Beta Kappa, Sigma Xi
1976 PHS Career Development Award
1980 Fogarty Senior International Fellowship, Montpellier, France (stopped flow and subzero temperature kinetic studies of enzymes with P. Douzou and C. Balny)
1997 Visiting Research Scholar, Institute for Protein Research, University of Osaka, Japan
2001 Fellow, Biophysical Society
2001 Fellow, American Association for the Advancement of Science
2003 External Distinguished Advisory Professor, Ehime University, Matsuyama, Japan
2004 Honorary Member (Silver Medal), NMR Society of Japan
C. Selected Peer-reviewed Publications (from more than 400 peer-reviewed publications)

**Most relevant to the current application**


**Additional recent publications of importance to the field**


D. Research Support

Ongoing Research Support

2P41 RR02301-25  J.L. Markley (PI)  03/01/10-02/28/15
National Biomedical NMR Resource at Madison
The major goals are to develop cutting-edge tools and resources for biomedical NMR spectroscopy as driven by collaborations and to make these available to facility users and the scientific community at large. Role: PI

P41 LM05799  J.L. Markley (PI)  09/15/09–08/31/14
Biological Magnetic Resonance Data Bank
The goals of this project are to develop and maintain the publicly accessible biomolecular NMR database. Role: PI

No grant number  T. J. Donohue (PI)  09/01/07-11/31/12
Great Lakes Bioenergy Research Center (GLBRC)
Agency: DOE
The objective is to carry out fundamental genomics-based research to remove bottlenecks in the biofuel pipeline. Role: Co-leader of a team investigating cell wall composition and structure

1 R01 GM 077139-01A1  Z. Zolnai (PI)  09/01/07–08/31/12
NIH/NIGMS
Development Evaluation and Testing of the Sesame LIMS
The objective of this project is to make the Sesame laboratory information management system more accessible to users by improving its efficiency and flexibility, making it easier for users to customize the system to their own needs, and improving and extending applications, and by providing improved documentation. Role: Co-investigator

1R01 DC009018-01A1  F. Assadi-Porter (PI)  01/07/08-06/30/13
NIH/NIDCD
The sweet protein brazzein and its interaction with the human taste receptor
The goals of this project are to determine the mechanism of interaction between the human sweet taste receptor and the sweet protein brazzein that lead to signal transduction. Role: Co-investigator

1U01 GM094622-01  J.L. Markley (PI)  07/01/10 - 06/30/15
NIGMS, NIH
Partnership for High-Throughput Enabled Biology of the Mitochondrial Proteome
The goals of this project are to promote structure-function investigations of mitochondrial proteins under the aegis of the Protein Structure Initiative (PSI:Biology). Role: PI

1U54 GM094584-01  B.F. Fox (PI)  07/01/10 - 06/30/15
NIGMS, NIH
Centers for Membrane Protein Structure Determination
The goal is to establish a large-scale center for the production and structural analysis of integral membrane proteins. Role: Co-investigator on NMR studies

MSN134727  N. Sheibani (PI)  12/01/10-11/30/13
NIH
Integrated Multidisciplinary Strategies for Detection of Diabetic Retinopathies
The goal of this collaboration is to develop metabolomic markers for detection of diabetic retinopathies. Role: Co-investigator

3P41RR002301-26S1  J.L. Markley (PI)  09/01/2011–02/29/2012
NCRR, NIH
National Biomedical NMR Resource at Madison
This supplement supports TRD1 on automation of structure determination of proteins and nucleic acids. Role: PI.
Pending Research Support
1R01 GM10885778 J.L. Markley (PI) 04/01/12-03/31/17
NIGMS, NIH
Dynamics and Conformational Equilibria in Iron-Sulfur Cluster Assembly / Delivery
This proposal will support investigations of the proteins involved in iron-sulfur cluster and delivery. Role: PI.
BIOGRAPHICAL SKETCH

NAME
Thomas F.J. Martin

POSITION TITLE
Professor of Biochemistry

eRA COMMONS USER NAME
tfmartin

EDUCATION/TRAINING
(Begin with baccalaureate or other initial professional education, such as)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cornell University, Ithaca, NY</td>
<td>A.B.</td>
<td>1968</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Harvard University, Cambridge, MA</td>
<td>Ph.D.</td>
<td>1974</td>
<td>Biophysics</td>
</tr>
<tr>
<td>Harvard Medical School, Boston, MA</td>
<td>postdoctoral</td>
<td>1974-78</td>
<td>Molecular Endocrinology</td>
</tr>
</tbody>
</table>

A. Personal Statement
Peptide hormones, neuropeptides and inflammatory agents are secreted from endocrine cells, neurons and mast cells by the process of Ca^{2+}-triggered vesicle exocytosis. My main research focus has been understanding the molecular basis for this process. My laboratory developed a permeable cell assay that revealed the role of a lipid (PIP_{2}) and discovered a protein (CAPS) required for regulated exocytosis in neuroendocrine cells. We have contributed to understanding the role of these and other proteins (SNAREs, synaptotagmins) in regulated secretion. Recent work has determined that CAPS and the related Munc13 proteins directly regulate the membrane fusion machinery by promoting assembly of SNARE protein complexes that bridge vesicle and plasma membranes. This process is coordinated by PIP_{2} and its metabolism (to DAG). Work in progress will determine the pathway by which trans SNARE complexes form and the means by which CAPS and Munc13 catalyze SNARE complex assembly.

B. Positions and Honors
1969 - 1973  USPHS Predoctoral Fellow, Program in Biophysics, Harvard University
1974 - 1975  American Cancer Society Research Fellow, Pharmacology, Harvard Medical School
1975 - 1978  USPHS Postdoctoral Research Fellow, Pharmacology, Harvard Medical School
1978 - 1983  Assistant Professor, Dept. of Zoology, University of Wisconsin-Madison
1983 - 1986  Associate Professor, Dept. of Zoology, University of Wisconsin-Madison
1986 - 1994  Professor, Dept. of Zoology, University of Wisconsin-Madison
1987 - 1991  NIH Cellular Biology and Physiology Study Section-member
1987 - 1992  H.I. Romnes Faculty Fellow, University of Wisconsin-Madison
1987 - 1993  Editorial Board: Journal of Biological Chemistry
2001 - present Editorial Board: Journal of Biological Chemistry
1988 - Present Editorial Board: Cellular Signalling
1991 - 1999  NIH MERIT Award
1994 - Present Professor, Dept. of Biochemistry, University of Wisconsin-Madison
1994 - 1998  NIMH Molecular, Cellular and Developmental Neurobiology Study Section
1996  Co-organizer, Symposium, Role of Phosphoinositides in Cell Signaling
1997  Co-organizer, Society for General Physiology Symposium, Mechanisms of Secretion
1997 - 2000  McKnight Investigator Award- McKnight Endowment Fund for Neuroscience
1999 - 2004  WARF Kellet Mid-Career Faculty Research Award, University of Wisconsin-Madison
2000  Chair, Cell Biology of the Neuron, Gordon Conference
1999 - 2004  NIH Molecular, Developmental and Cellular Neurobiology I Study Section (now SYN)(Chair, 2000- 2004)
1999 - Present NIH MERIT Award
C. Selected peer-reviewed publications (of ~110)

Most relevant to current application


Additional recent publications of importance to the field


D. Current research support:

R01 DK025861-32 Martin (PI)  07/01/79-03/31/14
NIH/NIDDK   Stages of regulated exocytosis

   The major goals of this project are to define the mechanisms utilized by Munc13 proteins in priming dense-core vesicle exocytosis.

R01 DK040428-23 Martin (PI)  06/10/98-03/31/16
NIH/NIDDK   Ca²⁺ regulation of secretion in neuroendocrine cells

   The major goal of this project is to elucidate the role and molecular mechanism of CAPS in dense-core vesicle exocytosis in neural and neuroendocrine cells.
NAME
Mitchell, Julie Carol

POSITION TITLE
Associate Professor of Biochemistry and Mathematics

eRA COMMONS USER NAME (credential, e.g., agency login)
jmmitchell

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Jose State University, San Jose CA</td>
<td>B.A.</td>
<td>1992</td>
<td>Mathematics</td>
</tr>
<tr>
<td>University of California at Berkeley, Berkeley CA</td>
<td>Ph.D.</td>
<td>1998</td>
<td>Mathematics</td>
</tr>
<tr>
<td>University of California at San Diego, La Jolla CA</td>
<td>Postdoctoral</td>
<td>1998-2001</td>
<td>Computational Biology</td>
</tr>
</tbody>
</table>

A. Personal Statement

My research applies a range of mathematical, bioinformatic and high-performance computing techniques to the study of molecular interactions and design. Current research focuses on the impacts of sidechain substitutions on binding affinity, specificity and conformational change (allostery). Recent work pursues the use of data on molecular sequence/structure evolution to study protein flexibility and protein association.

B. Positions and Honors

Positions and Employment
2009– Associate Professor of Biochemistry and Mathematics, University of Wisconsin–Madison
2003–2009 Assistant Professor of Biochemistry and Mathematics, University of Wisconsin–Madison
2001–2003 Assistant Principal Scientist, San Diego Supercomputer Center

Honors and Awards
1991 Richard Dieckmann Prize in Mathematics
1997 U.C. Regents Fellow
1997 Achievement Rewards for College Scientists (ARCS) Foundation Fellow
1998–2001 La Jolla Interfaces in Science Postdoctoral Fellow
2003–2008 Steenbock Career Development Award
2006–2008 Alfred P. Sloan Fellow in Molecular Biology
2007–2009 Vilas Associates Award

Other Experience and Professional Memberships
Director, Bringing Advanced Computational Techniques to Energy Research
Advisory Board Member, American Math Society Liaison Committee to AAAS

C. Selected Peer-reviewed Publications


**D. Research Support**

**Ongoing Research Support**

DOE-GTL DE-FG02-04ER25627 Mitchell (PI) 09/01/08–08/31/11

**Bringing Advanced Computational Techniques to Energy Research (BACTER-II)**

$4,200,000 (total)

The goal of this project is to develop computational approaches for the study of biological systems of relevance to energy research. Projects range from genomics to protein/DNA structure to whole cell and organism models, and research is done collaboratively among researchers from both quantitative and biological sciences. Dedicated support staff also aid in professional development of students and postdocs, such as writing and software development training.

Role: PI
Alignment of Protein Surfaces
$630,660 (total)
The goal of this project is to define geometric and biophysical measures on smoothed protein surfaces that facilitate rapid alignment and search of functionally important regions. Initial collaboration on this project has led to the GRAPE server for visualizing low-resolution protein surfaces and chemical features. Role: Co-Investigator

Pending Research Support

NIH Mitchell (PI) 12/01/11 - 11/30/15
Incorporating Cross-Species Scoring and Flexibility into Protein Docking Prediction
$700,000 (direct)
The goal of this project is to develop protein docking tools able to simultaneously model and score binding interactions across multiple species. By scoring orthologous interactions in addition to docking targets, reduction in the rate of false positive results produced by scoring functions can be reduced. As well, the use of structurally related proteins is used to predict and model flexible regions within docking targets. Role: PI

NSF Multi-Site (Wei, MSU PI; Mitchell UW PI; Liu PSU PI) 05/01/12 - 04/30/15
Variational Multiscale Approaches to Biomolecular Structure, Dynamics and Transport
$568,526 (total to Mitchell)
The goal of this award is to create multiscale mathematical models for electrostatics and molecular dynamics. Combining techniques from differential geometry, robotics and molecular modeling, accurate dynamical models for large systems such as cell membranes are the global project goal.

Completed Research Support

DOE-GTL DE-FG02-04ER25627 Mitchell (PI) 09/01/04 - 08/31/08
Bringing Advanced Computational Techniques to Environmental Research (BACTER)
$3,670,000 (total)
The goal of this project is to develop computational approaches for the study of biological systems of relevance to energy research. Projects range from genomics to protein/DNA structure to whole cell and organism models, and research is done collaboratively among researchers from both quantitative and biological sciences. Role: PI

NIH-NCI 5R01CA073808-10 Raines (PI) 07/01/04–05/31/08
Ribonucleases in Cancer Therapy
$800,000 (direct)
The major goal of this project is to develop new class of cancer chemotherapeutics based on engineering mutations into ribonuclease A that preserved catalytic activity but abolished wild-type activity. These successful designs were tested experimentally in the lab of Ronald Raines, and later variations based on human ribonuclease 1 are involved in clinical trials as cancer therapeutics. Role: Co-investigator

Vilas Associates Award Mitchell (PI) 07/01/07-06/30/09
$70,000 (direct)
Redesign of Smad4-Ski Interface
The major goal of this project was to design variants of the Smad4 protein than bound competitively to the Ski oncoprotein. These successful designs were experimentally tested in the lab of Michael Hoffmann. Role: PI
Parallel Protein Docking and Interaction Dynamics with Adaptive Mesh Solutions to the Poisson-Boltzmann Equation
The major goal of this project is to develop parallel computing tools for protein-protein and protein-DNA docking based on a Debye-Huckel electrostatic model and adaptive mesh solutions to the Poisson-Boltzmann equation. Many core codes that were developed as part of this award are still used in our docking software today.
Role: PI

Nonlinear Signal Analysis Approach to Protein Structure Dynamics
The major goal of this project is to develop mathematical models to describe and predict protein aggregation and amyloid plaque formation.
Role: Key Personnel

E. Synergistic Activities

Director of the BACTER Computational Biology Program at UW-Madison
Member of the American Math Society Liaison Committee to AAAS
Steering Committee Member for the Wisconsin Institutes of Discovery Medical Optimization Group
Development of Mathematical Methods for Structural Biology course and extensive course materials
Curriculum Vitae

David L. Nelson

Address:  Department of Biochemistry
          University of Wisconsin-Madison
          433 Babcock Drive
          Madison, WI  53706-1569
          (608) 263-6879

Education and Professional Experience:

1964  B.S.  Chemistry and Biology, St. Olaf College, Northfield, MN
1969  Ph.D.  Biochemistry, Stanford University Medical School (Thesis
          Supervisor:  A. Kornberg)
1969-1971  Post-doctoral Fellow in Biochemistry
          Harvard Medical School (Supervisor:  E. P. Kennedy)
1971-present  Assistant (1971), Associate (1975), Professor (1982) of Biochemistry,
          University of Wisconsin-Madison
1991-1992  NIH MARC Visiting Professor, Spelman College, Atlanta, GA
2002- 2011  Director, Center for Biology Education

Honors:

1963  Phi Beta Kappa
1964  Graduation summa cum laude
      Blue Key Honor Society
1964-1969  National Science Foundation Pre-doctoral Fellow
1964  Woodrow Wilson National Fellow (Honorary)
1969  Helen Hay Whitney Fellowship (declined)
1969-1971  Cystic Fibrosis Foundation Post-doctoral Fellowship
1973-1978  Harry and Evelyn Steenbock Career Advancement Award
1975-1980  Research Career Development Award (NIH)
1975  Excellence in Teaching Award, University of Wisconsin
      College of Agricultural and Life Sciences
1975-1978  Dreyfus Teacher-Scholar Award
1983  Distinguished Teaching Award, University of Wisconsin
1985  Myron and Anna Atwood Distinguished Professor of Biochemistry
1986  Phi Kappa Phi Honor Society
1991  NIH Minority Access to Research Careers Visiting Professorship,
      Spelman College
1994  University of Wisconsin Teaching Academy
2000  Brenda Pfaehler Award of Excellence from TRIO Student Support Services
      Program (UW-Madison)
2001  History of Science Society
RELEVANT UNIVERSITY SERVICE

- Biocore Curriculum Steering Committee (1980-1991)
- Academic Planning Council (CALS) (1984-1987)
- CALS Biotechnology Curriculum Committee (1985-1987)
- CALS Kellogg Curriculum Reform Steering Committee (1986-1989)
- Center for Biology Education Steering Committee (1992-1995)
- CALS Diversity Committee (Chairman) (1992-1993)
- Advanced Opportunity Fellowship Committee (Grad School) (Chair-1994-1997)
- Teaching Academy (1994-present; executive committee)
- Medical School Admissions Committee (1994-1996)
- CALS Undergraduate Instructional Improvement Committee (1996-2000) (Chair, 1998-2000)
- CALS Curriculum Committee (2001-present)
- Provost's Committee to Plan ICBE
- L&S Honors Committee (2004-)
- CALS Honors Committee (2004-)
- Institute for Cross-College Biology Education Executive Committee (2004-)
- Teaching Academy Executive Committee (2003-)
- Molecular Biology Major outside review committee (Chair) (2004)

**Formal research mentoring:** During the past 40 years, Nelson has trained 25 Ph.D.s, 6 M.S.s, and has sponsored between 70 and 80 undergraduates in research

**Support (Active):**

1. **Arnold and Mabel Beckman Foundation:** Beckman Scholars Program: Undergraduate Research at the Interface of Chemistry and Biology $105,600 for the 2-year period 2004-2006.
2. **NSF** Physical Models in Teaching Structure and Function of Macromolecules $194,000 for period 8/1/04-7/31/07

Courses taught (At University of Wisconsin-Madison):

<table>
<thead>
<tr>
<th>Course</th>
<th>Enrollment</th>
<th>Times offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochem 201: Introduction for Allied Medical Scientists</td>
<td>350 students</td>
<td>15x</td>
</tr>
<tr>
<td>Biochem 501: Introduction for life science majors</td>
<td>300</td>
<td>25x</td>
</tr>
<tr>
<td>Biochem 507-508 Intro for biochem majors</td>
<td>200</td>
<td>15x</td>
</tr>
<tr>
<td>Biochem 640 Molecular Neurobiology</td>
<td>50</td>
<td>5x</td>
</tr>
<tr>
<td>Biochem 729 Membrane Structure and Function</td>
<td>40</td>
<td>30x</td>
</tr>
<tr>
<td>Biochem 699 Honors Papers in Biochemistry</td>
<td>40</td>
<td>35</td>
</tr>
<tr>
<td>Biochem 903 Seminar on Membranes</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Inter-CALS 388 Introduction to research</td>
<td>20-30</td>
<td>4</td>
</tr>
</tbody>
</table>
Publications: Books


Publications: Research papers since 1988


Reviews:


A. Personal Statement

Ntambi has worked on genetic aspects of obesity and related metabolic diseases since 1985. He has worked on adipocyte differentiation, hormonal and dietary regulation of gene expression, and in more recent years, he has used a multidisciplinary approach to unravel the physiological role of the stearoyl-CoA desaturase genes in lipid and carbohydrate metabolism. His laboratory combines metabolic research with current approaches of genetics and mouse gene knockout technology. Ntambi’s independent level of expertise in metabolism is recognized by the research community as indicated by his role as corresponding author on the subset of publications supported by NIH since 2002, invitations to speak and chair sessions at national meetings, to review papers for refereed Journals and to contribute to invited reviews.

B. Positions and Honors

Positions
1989-1992 Assistant Professor of Biochemistry and Molecular Biology, Georgetown University Medical School, Washington DC
1992-1997 Assistant Professor of Biochemistry and Nutritional Sciences, University of WI-Madison
1997 Associate Professor of Biochemistry and Nutritional Sciences, University of WI-Madison
2002- Professor of Biochemistry and Nutritional Sciences, University of WI-Madison
2003- Steenbock Professor, Professor of Biochemistry and Nutritional Sciences, University of WI-Madison
2011- Director, Inter departmental Graduate Program in Nutritional sciences, UW-Madison
- Chair, Dept. of Nutritional Sciences UW-Madison

Peer Review Memberships
1998-2001 American Heart Association/Wisconsin Affiliate
2002-2004 NIH Physiological Chemistry Study Section
NRC/National Academy of Sciences
2002-2004 Food and Nutrition Board IOM
2004-2006 NIH MGC Study Section
2003-2007 Board of Scientific Counselors, NIAAA
2008- NIH CADO study section

Honors and Awards
1985-1987 Rockefeller Foundation Postdoctoral Fellowship
1986 Rockefeller Biotechnology Career Fellowship
1988 Biennial L.W. Frolich Award Fellowship by the New York Academy of Sciences
1992 Steenbock Career Development Award, Dept of Biochemistry, University of WI-Madison
1997-2003 Fogarty International Center/NIH International Biomedical Research Minority Faculty Fellow
2001-2003 Wisconsin/Hilldale Faculty Research award
C. Selected peer-reviewed publications (from a total of 145).


Makoto Miyazaki1, Harini Sampath, Xueqing Liu, Matthew T. Flowers, Kiki Chu, Agnieszka Dobrzyn and James M. Ntambi Stearoyl-CoA Desaturase-1 deficiency attenuates obesity and insulin resistance in leptin-resistant obese mice BBRC 380, 818-822 (2009)
Harini Sampath, Matthew T. Flowers, Xueqing Liu, Chad M. Paton, Ruth Sullivan, Kiki Chu, Minghui Zhao, and James M. Ntambi. Skin-specific deletion of stearoyl-CoA desaturase-1 alters skin lipid composition and protects mice from high-fat diet-induced obesity JBC 284 19961-19973 (2009)
Chad M. Paton and James M. Ntambi (2010) Loss of stearoyl-CoA desaturase activity leads to free cholesterol synthesis through increased Xbp-1 splicing. AJP 299 (6), 1066-75
Matthew T. Flowers, Chad M. Paton, Sheila M. O’Byrne, Kevin Scheisser, John Dawson, William S. Blaner, Christina Kendziorski, James M. Ntambi (2011) Metabolic Changes in Skin Caused by Scd1 deficiency: A Focus on Retinol Metabolism PLoS one 5, (5) e19734

D. Research support (last three years):

ONGOING RESEARCH SUPPORT

<table>
<thead>
<tr>
<th>Grant Number</th>
<th>PI Name</th>
<th>Amount</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIS01182</td>
<td>Ntambi (PI)</td>
<td>$39,957.00</td>
<td>10/1/2007-09/30/2011</td>
<td></td>
</tr>
<tr>
<td>R01 DK062388</td>
<td>Ntambi (PI)</td>
<td>$183,702.00</td>
<td>7/1/2006-5/31/2012</td>
<td></td>
</tr>
<tr>
<td>R01 AG037000</td>
<td>Anderson (PI)</td>
<td>$180,437.00</td>
<td>5/1/2010-4/30/2015</td>
<td></td>
</tr>
</tbody>
</table>

Probing the Tissue-Specific Role of Stearoyl-CoA Desaturase-1 in Diet-Induced Obesity and Diabetes
The major goal of this research is to study how leptin regulates the expression of stearoyl-CoA desaturase in peripheral tissues.
Role: PI

Role of Stearoyl-COA Desaturase in Metabolism
The major goal is to determine the molecular mechanism for how stearoyl-CoA desaturase-1 deficiency down regulates lipogenesis and induces fatty acid oxidation.

Metabolic regulators in the mechanisms of caloric restriction
The goal of this project is to study Caloric Restriction (CR) which appears to delay the onset of aging and extends lifespan in diverse experimental organism through an unknown mechanism.
Role: Co-Investigator

UW-Madison Department of Medicine Anderson (PI) $16,609.00 9/1/2011-8/31/2012
Impact of CR on systemic signaling in rhesus monkeys
The goal of this study is to determine the impact of long-term CR on adipose-derived signaling in animals from the WNPRC P01 study.
Role: Co-Investigator

PENDING

<table>
<thead>
<tr>
<th>PI Name</th>
<th>Amount</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spangenburg , PI , University of Maryland</td>
<td>$8,513.00</td>
<td>4/1/2012-3/31/2017</td>
<td></td>
</tr>
<tr>
<td>NIH/NIDDK</td>
<td>0.6 calendar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Estrogens maintain insulin sensitivity in hepatic tissue by reducing SCD-1 function.”</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ntambi (PI) $39,733 9/1/2012-8/30/2016
Hatch
Role of Hepatic Stearoyl-CoA Desaturase-1 in Diet-induced Obesity and Type 2 Diabetes

COMPLETED RESEARCH SUPPORT
R01 DK062388  Ntambi (PI)  $61,633.00  4/1/2010-3/31/2011
Administrative Supplement to Role of Stearoyl-CoA Desaturase in Metabolism
This is an administrative supplement allowed us to continue this research project during a gap in funding and is being used to support a postdoctoral fellow.
Role: PI

R01 DK062388  Ntambi (PI)  $30,077.00  7/1/2006-5/31/2011
Diversity Supplement to Role of Stearoyl-CoA Desaturase in Metabolism
This is a Research Supplement to Promote Diversity in Health-Related Research for Ade, a graduate student of African American background.

DK062388-08S1  Ntambi (PI)  $7,688.00  7/15/2009-6/30/2010
ARRA NIDDK summer student supplement
The goal of this project is to provide an undergraduate with research experience during the summer.
BIOGRAPHICAL SKETCH

NAME
Pagliarini, David James

POSITION TITLE
Assistant Professor, Department of Biochemistry

eRA COMMONS USER NAME (credential, e.g., agency login)
dpagliarini

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Notre Dame</td>
<td>B.S.</td>
<td>1995–1999</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>University of Michigan</td>
<td>M.S.</td>
<td>1999–2002</td>
<td>Biological Chemistry</td>
</tr>
<tr>
<td>University of California, San Diego</td>
<td>Ph.D.</td>
<td>2003–2005</td>
<td>Biomedical Sciences</td>
</tr>
</tbody>
</table>

A. Positions and Honors

Positions and Employment
2005-2009 Postdoctoral Research Fellow, Harvard Medical School
2008-2009 Visiting Scholar, University of California, San Diego
2009- Assistant Professor, Department of Biochemistry, University of Wisconsin - Madison

Honors and Awards
1997 HHMI Undergraduate Research Fellowship
1998 NSF Undergraduate Research Fellowship
2001 NIH Pharmacological Sciences Training Program (PSTP)
2003 NIH Pharmacology Training Grant
2008 NIH/NCI Growth Regulation & Oncogenesis Training Grant
2009 ARRA Challenge Grant Recipient
2011 Searle Scholar Award
2011 Ellison Medical Foundation New Scholar Award in Aging (declined)
2011 Glenn Foundation for Medical Research Award

B. Selected Peer-Reviewed Publications
5. Rardin MJ, Wiley SE, Murphy AN, Pagliarini DJ, and Dixon JE, Dual Specific Phosphatases 18 and 21 Target to Opposing Sides of the Mitochondrial Inner Membrane, Journal of Biological Chemistry 2008: 30;283(22):15440-50. PMCID: PMC2397459


*Indicates equal author contribution (references 6-8)

C. Research Support

Current Research Support

1 U01 GM094622 Markley (PI/Director); Pagliarini (Co-PI/Co-Director) 07/01/2010-06/30/2015
NIH/NIGM U01 Cooperative Agreement Grant
Partnership for High-Throughput Enabled Biology of the Mitochondrial Proteome
This study applies high-throughput genomics tools to elucidate the structure and function of a wide range of mammalian mitochondrial proteins.
Role: Co-PI/Co-Director

Searle Scholars Program Pagliarini (PI) 07/01/2011-06/30/2014
Chicago Community Trust
Integrative Analysis of an Ancient Mitochondrial Kinase
This study aims to define the role of the mitochondrial kinase coq8 in regulating endogenous Coenzyme Q biosynthesis.
Role: PI

MSN147143 Pagliarini (PI)
Glenn Award for Research in Biological Mechanisms of Aging 08/01/2011-07/31/2013
Glenn Foundation for Medical Research Award
Role: PI

Pending Research Support

MSN148505 Pagliarini (PI) 01/01/2012-12/31/2012
National Ataxia Foundation
Mass spectrometry-based approaches to investigating SCAR9
This study employs mass spectrometry-based proteomic and metabolic tools toward understanding the alterations that drive the development of this mitochondria-based recessive spinocerebellar ataxia.
Role: PI

MSN148724 Pagliarini (PI)
USDA HATCH Grant
Nutrient-controlled remodeling of the mitochondrial proteome 01/01/2012-12/31/2015
This study aims to elucidate the mechanisms that drive the remodeling of the mitochondrial proteome during select nutrient stresses, such as iron deprivation, using matched large-scale genomic and proteomic data sets.
Completed Research Support

1 RC1 DK086410-01 Pagliarini (PI) 09/25/2009-08/31/2011
NIH/NIDDK ARRA Challenge Grant

Quantitative Mitochondrial Proteomics of Healthy and Diabetic Mice
This study involves the use of quantitative proteomics and phospho-proteomics to assess the role of mitochondrial dysfunction in obesity-induced type II diabetes.
Role: PI
BIOGRAPHICAL SKETCH

NAME
Palmenberg, Ann Carol

POSITION TITLE
Professor, Dept of Biochemistry
Director, Institute for Molecular Virology

eRA COMMONS USER NAME (credential, e.g., agency login)
acpalmen

EDUCATION/TRAINING  (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>St Lawrence University, Canton NY</td>
<td>BS</td>
<td>1970</td>
<td>Chemistry</td>
</tr>
<tr>
<td>U Wisconsin-Madison, Madison WI</td>
<td>PhD</td>
<td>1975</td>
<td>Biochemistry</td>
</tr>
</tbody>
</table>

A. Personal Statement

Ann Palmenberg has been PI of a continuously funded (NIH) independent research laboratory at the UW-Madison since 1978. During that time her work on the molecular biology of positive-sense RNA viruses, particularly cardioviruses and rhinoviruses in the picornavirus family, has achieved international stature for its breadth and content. Her cDNAs, replicons, vaccines, IRESes, self-cleaving proteases, recombinant enzymes, antibodies, protein and RNA structure data, have been disseminated to hundreds of laboratories world-wide, and her work has provided technical models and intellectual foundations many more difficult viral systems. With specific regard to rhinoviruses, she led the collaborative team responsible for sequencing all known HRV-A and HRV-B genotypes (2009), and was PI for the recent project that cultured and cloned the first HRV-C (2011). Her personal skill set (which she teaches at the graduate level at the UW-Madison), includes a strong understanding of the bioinformatics of sequence analysis and computer-based molecular modeling. Her research programs have provided the format for the training of many graduate students, postdoctoral fellows and scientists, in areas of recombinant engineering, protein biochemistry and molecular biology of RNA viruses.

B. Positions and Honors

Professional Experience:
1975-1979 NIH Postdoctoral Fellow, University of Zurich, Switzerland, Charles Weissman, mentor
1987-1997 Assoc, Full Professor (1993), Dept of Animal Health & Biomedical Sciences, and Inst. for Molecular Virology, UW-Madison, WI.
1997-pres Professor, Dept of Biochemistry, and Dir, Inst. for Molecular Virology, UW-Madison, WI.

Honors and Awards:
1970 Phi Beta Kappa
1970 Magna Cum Laude, Highest Honors in Chemistry, St. Lawrence U
1990 CALS, Pound Research Award, UW Madison
1991 Romnes Faculty Fellow, UW Madison
1996 Vilas Associate Fellow, UW Madison
1998 WARF Faculty Fellow, UW Madison
2007-2008 President, American Society for Virology
2009 American Academy of Microbiology Fellow
2009-2010 Hilldale Faculty Achievement Award in the Biological Sciences, UW Madison

Memberships:
1980-pres Am. Society for Virology (life member), Am. Society for Microbiology
1988-1992 NIH Study Section Member (VIRA and VIRB), *ad hoc* 1994-present
1990-2005 International Committee on Taxonomy of Viruses (ICTV), Exec Board 2001-2005
1998-2001 Am Type Culture Collection, Virology Advisory Board
1993-2005 Associate Editor, Virology
2009-2012 Advisory Committee, RSCB Protein Data Bank

C. Selected Peer-reviewed Publications (from among ~100 on picornavirology, HRV pubs listed last)

D. Research Support
Current Active Support:
- RO1 AI017331 (PI: Palmenberg) 12/01/80-12/11/13 total project period
- NIH/NIAID 12/12/08-12/11/13 current project period

**Cardioviral Proteases and Comparative Genome Structure:** The goals of this project are to study at the molecular level the enzymatic mechanisms of protein translation, proteolytic processing and virus-host interactions in cardioviruses.
**Overlap:** None
Project 4: Rhinovirus-Induced Shutoff Of Cellular Responses: The goal of this project is to examine the molecular biology of rhinovirus proteases and their roles in the shutoff of host cell functions. 
Overlap: current application is a 5 yr renewal of this project, independent of the U19 program

Virology Training Program: This grant funds an institutional training program for predoctoral students and postdoctoral fellows in the study of virology, on the UW-Madison campus. ACP is co-PI along with Paul Lambert of the UW Medical School.
Overlap: None

Current Pending Support:
one
BIOGRAPHICAL SKETCH

NAME
George N. Phillips, Jr.

POSITION TITLE
Professor of Biochemistry and of Computer Sciences

eRA COMMONS USER NAME (credential, e.g., agency login)
GNPHILLIPS

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice University, Houston, Texas</td>
<td>B.A.</td>
<td>1974</td>
<td>Chemistry and Biochem.</td>
</tr>
<tr>
<td>Rice University, Houston, Texas</td>
<td>Ph.D.</td>
<td>1976</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Brandeis University</td>
<td>Post-doc</td>
<td></td>
<td>Structural Biology</td>
</tr>
</tbody>
</table>

A. Personal Statement
Dr. Phillips joined the faculty at the University of Wisconsin-Madison in 2000 as Professor of Biochemistry and of Computer Sciences. Before that, he was at Rice University in the Dept. of Biochemistry and Cell Biology and Co-Director of the W.M. Keck Center for Computational Biology. Prof. Phillips is an accomplished structural biologist with over 300 depositions to the Protein Data Bank and over 200 publications. His work has included contributions in the areas of protein production in heterologous hosts, structural biology of heme proteins, muscle regulatory proteins, enzymes, and dynamics of proteins and the development of crystallography, including time-resolved crystallography, new algorithms for solution of structures, and structural bioinformatics. Prof. Phillips is the Program Director of UW-Madison’s NLM supported pre- and postdoctoral training grant entitled Computation and Informatics in Biology and Medicine. Awards include Arnold O. Beckman awards while at the University of Illinois, a Vilas Award from the UW-Madison, and an Established Investigatorship from the American Heart Association. Prof. Phillips currently serves as Associate Editor of the journal Proteins, is President-elect of the American Crystallographic Association, and is a member of numerous advisory committees. Prof. Phillips is a Co-Investigator at the UW Center for Eukaryotic Structural Genomics, where he has been in charge of the cores for bioinformatics and computations and the platforms for protein crystalization and X-ray structure determination. He is also PI of an NIH Protein Structure Initiative high-throughput structural biology project.

B. Positions and Honors

Professional Experience

<table>
<thead>
<tr>
<th>Year(s)</th>
<th>Position Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-1987</td>
<td>Assistant Professor of Biophysics and Biochemistry, University of Illinois</td>
</tr>
<tr>
<td>1987-1992</td>
<td>Associate Professor of Biochemistry, Rice University</td>
</tr>
<tr>
<td>1992-2001</td>
<td>Professor of Biochemistry and Cell Biology, Rice University</td>
</tr>
<tr>
<td>1993-2001</td>
<td>Adjunct Professor of Biochemistry, Baylor College of Medicine</td>
</tr>
<tr>
<td>2001-2009</td>
<td>Adjunct Professor of Biochemistry and Cell Biology, Rice University</td>
</tr>
<tr>
<td>2007-2009</td>
<td>Director of Informatics and Information Technology, Great Lakes Bioenergy Research Center</td>
</tr>
<tr>
<td>2001-2010</td>
<td>Deputy Director, Center for Eukaryotic Structural Genomics, University of Wisconsin</td>
</tr>
<tr>
<td>2000-present</td>
<td>Professor of Biochemistry and of Computer Sciences, Univ. of Wisconsin-Madison</td>
</tr>
<tr>
<td>2001-present</td>
<td>Associate Member, Genome Center of Wisconsin, University of Wisconsin-Madison</td>
</tr>
<tr>
<td>2002-present</td>
<td>Program Director, Center for Informatics in Biology and Medicine</td>
</tr>
<tr>
<td>2011-2012</td>
<td>Vice President / President American Crystallographic Association</td>
</tr>
</tbody>
</table>

Honors

<table>
<thead>
<tr>
<th>Year(s)</th>
<th>Honor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974-1976</td>
<td>Robert A. Welch Predoctoral Fellowship (Rice University)</td>
</tr>
<tr>
<td>1977-1980</td>
<td>National Institutes of Health Postdoctoral Fellow</td>
</tr>
<tr>
<td>1980-1982</td>
<td>Medical Foundation Research Fellow</td>
</tr>
<tr>
<td>1982, 1986</td>
<td>Arnold O. Beckman Research Award (University of Illinois)</td>
</tr>
<tr>
<td>1983-1988</td>
<td>Established Investigatorship, American Heart Association</td>
</tr>
<tr>
<td>2001</td>
<td>Robert A. Welch Lecturer</td>
</tr>
<tr>
<td>2003</td>
<td>Vilas Award, UW-Madison</td>
</tr>
</tbody>
</table>
Present Membership on Federal Advisory Panels
2009-present  NIH GMCA Synchrotron Facility Advisory Committee
2008-present  NIH NSLS-II Synchrotron Advisory Committee (Chair)
2011-present NIH Protein Structure Initiative Data Committee (Chair)

C. Selected Recent Publications (Selected from 225 peer-reviewed publications)

Most relevant to the current application


Additional recent publications of importance to the field (in chronological order)


D. Research Projects Ongoing or Completed in the Last 3 Years
Ongoing
Title: Machine Learning and Visualization in Structural Biology
Principal Investigators: Jude Shavlik-PI, G. Phillips-Co-PI
Agency: National Library of Medicine
Type: R01 (LM-064598, years 4): Period 05/01/06 to 05/30/10
Specific Aims: The major goals of this project are to develop new methods of interpreting electron density maps from protein crystallography and new ways of visualizing the resulting structures.

Title: Engineering Cellulases for Biofuel Production – Great Lakes Bioenergy Research Center.
Principal Investigators: Tim Donohue-PI, G. Phillips-Project Leader
Agency: DOE
Type: BRC (Project 5.3.2): Period 09/01/07 to 010/31/12
Specific Aims: The major goals of this project are to develop technology for improving cellulases for biofuel production, and other structural studies of bioenergy related proteins.

Title: Physical and Chemical Alignment of Multiple Protein Surfaces
Agency: NSF 0941013
Type: CDI-Type 1 - : Period 12/01/2010 to 12/31/2012
Specific Aims: We aim to develop an approach to aligning the functional surfaces of proteins, that is, comparing their geometric and physical properties directly.

Title: Transmembrane Protein Center
Principal Investigator: Brian G Fox
Agency: NIH / NIGMS
Type: U54 (GM094584) Period 7/1/2010 – 6/30/2015
Specific Aims: Technology development for isolation and characterization of eukaryotic membrane proteins.

Title: Enzyme Discovery for Natural Product Biosynthesis
Principal Investigator: George N Phillips, Jr
Agency: NIH / NIGMS
Specific Aims: Technology development for natural products biosynthesis.

Completed

Title: Center for Eukaryotic Structural Genomics
Principal Investigators: John Markley-PI, G. Phillips-Co-PI
Agency: NIH NIGMS
Type: U54 (GM074901, years 5) Period 07/01/05 to 06/30/10
Specific Aims: The major goals of this project are to develop technology for high-throughput structure determination by X-ray crystallography and NMR spectroscopy and to apply this technology to high-priority targets from eukaryotic genomes, particularly *homo sapiens*.

Title: Experimental Design for Crystallization Plates
Principal Investigators: G. Phillips-Co-PI
Agency: Bruker-AXS,Inc.
Type: Sponsored research Period 09/01/07 to 12/31/10
Specific Aims: The major goal of this project is to develop software, called Crystal Farm Pro, to support the optimization of protein crystallization, including database support and a graphical user interface.
BIOGRAPHICAL SKETCH

J. Wesley Pike
Wespike (ERA Commons)
Professor of Biochemistry

Oregon State University                  BS 1970 Zoology
Oregon State University                MS 1972 Physiology
University of Arizona                Ph.D. 1979 Biochemistry

A. Personal Statement
I have been involved in delineating the mechanism of action of vitamin D for almost 35 years. I characterized the receptor for 1,25(OH)2D3, developed antibodies to this protein in 1981, and cloned the structural and then the chromosomal gene in 1987 and 1989. We designated the receptor the VDR in 1988 and went on to assess how the VDR functioned to control gene expression. Since that time, I have been involved in determining how the VDR and its ligand activate the expression of a variety of genes including osteocalcin (Bglap), Cyp24a1, osteopontin (Spp1), LRP-5, Rankl, and many others. In 2004, we employed the first ChIP-chip analysis to identify the locations of enhancers at several loci including the mouse and human VDR genes themselves. The discovery of several intronic enhancers within this gene that were active in bone cells and several upstream regulatory regions as well represented a breakthrough for us, as examination of this gene prior to those studies had failed to identify regulation by hormones such as 1,25(OH)2D3 and other steroid and peptide hormones at the proximal promoter. Our studies demonstrated the reason: VDR gene regulation involved multiple distal enhancers that were not located at the promoter. This insight appears to be recapitulated across many genes as a result of new and unbiased approaches facilitated by ChIP-chip and ChIP-seq analyses. These studies also enabled defining the entire mouse and human VDR gene loci and the development of BAC clone transgenes capable of recapitulating endogenous mouse VDR gene expression in vivo and rescuing the VDR null phenotype. This work was supported in the last two years by ARRA funding and provides the basis for the proposed work. These new findings about the VDR gene represent a personal success for me, given the many years that I have worked on the expression and mechanism of action of 1,25(OH)2D3 and the VDR. We are hopeful that the proposed studies will open other avenues of research on this receptor that will be of disease and therapeutic value.

B. Professional Positions, Awards and Honors

Professional Positions
USPHS Postdoctoral Fellow, Department of Biochemistry, College of Medicine, University of Arizona, 1979-1981.
Adjunct Instructor, Department of Biochemistry, University of Arizona, 1981-1982.
Research Assistant Professor, Department of Biochemistry, University of Arizona, 1982-1985.
Research Associate Professor, Department of Biochemistry, University of Arizona, 1985-1986.
Associate Professor, Departments of Cell Biology and Pediatrics, Baylor College of Medicine, 1986-1991.
Senior Director and Head, Department of Biochemistry, Ligand Pharmaceuticals Inc., 1991-1996.
Professor, Department of Molecular and Cellular Physiology, University of Cincinnati, 1996-2001.
Professor, Department of Biochemistry, University of Wisconsin-Madison, 2001-present.

Awards and Honors
Procter and Gamble Young Investigator, 1981.
Osborne and Mendel Award of the Nutrition Foundation for outstanding basic research (shared by M.R. Haussler), 1984.
Mary S. Shorb Lecturer in Nutrition, University of Maryland at College Park, 1991.
Invited Speaker, American Association for Cancer Research, Steroid Receptors and Cancer, 1995.
Invited Speaker, Tenth Workshop on Vitamin D, Strasbourg, France, 1997.
Invited Speaker, 12th Workshop on Vitamin D, Maastricht, The Netherlands, July, 2003
Invited Speaker, Gordon Conference, Bones and Teeth, Meriden, NH, August 2003.
Invited Speaker, Cancer Chemoprevention and Cancer Treatment-Vitamin D, NIH, Bethesda, MD, Nov 2004

B. Selected Peer-reviewed Publications (From 248 refereed papers, chapters, articles, and book editorials)


C. Research Projects Ongoing or Completed in the Last 3 years
Ongoing Research Support:
Agency: NIH/National Institute of Diabetes, Digestive and Kidney Diseases
R02 DK72281  7/1/05 to 6/30/09; 7/1/09 to 6/30/13
Principal Investigator: J. Wesley Pike, Ph.D
“Dynamic Mechanisms of Vitamin D-Induced Gene Expression”
The major goals of this project are to determine fundamental mechanisms whereby 1,25(OH)₂D₃ activates the expression of genes in osteoblast precursors and mature osteoblasts at the genome-wide level.

Agency: NIH/National Institute of Diabetes, Digestive and Kidney Diseases
R01 DK74993  12/1/06 to 11/30/12
Principal Investigator: J. Wesley Pike, Ph.D
“Molecular Mechanisms of RANKL Activation in Osteoblasts”
The major goals of this project are to determine the mechanisms whereby calcitropic agents and cytokines regulate the expression of RankL in osteoblast-like cells.

Agency: NIH/National Institute of Diabetes, Digestive and Kidney Diseases
R01 DK74993-03S2  08/15/09 to 08/14/11 (ARRA) (Supplement to R01 DK74993)
Principal Investigator: J. Wesley Pike, Ph.D
“Molecular Mechanisms of RANKL Activation in T cells”
The major goals of this project are to determine the mechanisms whereby activation regulates the expression of RankL in T cells.

Agency: NIH/National Institute of Diabetes, Digestive and Kidney Diseases
R01 DK73995-012  4/1/08 to 3/31/13
Principal Investigator: J. Wesley Pike, Ph.D
“Vitamin D ligands and regulation of calcium homeostasis”
The major goals of this project are to determine the mechanisms whereby 1,25(OH)₂D₃ and novel synthetic analogs of 1,25(OH)₂D₃ regulate genes involved in calcium homeostasis in vivo.

Agency: NIH/National Institute of Arthritis, Musculoskeletal and Skin Disease.
R02 AR45173 -07  9/15/11 to 09/30/16
Principal Investigator: J. Wesley Pike, Ph.D.
“Bone cell regulation of the vitamin D receptor”
The major goals of this project are to determine how the vitamin D receptor is regulated both in vitro and in vivo.

Agency: Pfizer Pharmaceuticals, Inc.
WS827969  11/01/10 to 3/31/12
Principal Investigator: J. Wesley Pike, Ph.D.
“Mechanistic Profiling for the Differential Actions of Selective Estrogen Receptor Modulators”
The major goals of this project are to identify molecular imprints of estrogen ligand actions on breast, uterine and bone cell genomes.
**BIOGRAPHICAL SKETCH**

<table>
<thead>
<tr>
<th>NAME</th>
<th>POSITIVE TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raines, Ronald T.</td>
<td><em>Henry Lardy Professor of Biochemistry and Professor of Chemistry</em></td>
</tr>
</tbody>
</table>

**eRA COMMONS USER NAME (credential, e.g., agency login)**

*rtaines*

**EDUCATION/TRAINING** *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIT, Cambridge, MA</td>
<td>Sc.B.</td>
<td>05/80</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Harvard University, Cambridge, MA</td>
<td>Sc.B.</td>
<td>05/80</td>
<td>Biology</td>
</tr>
<tr>
<td>University of California, San Francisco, CA</td>
<td>A.M.</td>
<td>11/82</td>
<td>Chemistry (Organic)</td>
</tr>
<tr>
<td></td>
<td>Ph.D.</td>
<td>05/86</td>
<td>Chemistry (Organic)</td>
</tr>
<tr>
<td></td>
<td>(Postdoc)</td>
<td>1986–1989</td>
<td>Biochemistry &amp; Biophysics</td>
</tr>
</tbody>
</table>

**A. Personal Statement**

My coworkers and I are using tools from chemistry and biology to reveal the basis and purpose for the structure and function of proteins. We have discovered an RNA-cleaving enzyme that is in a human clinical trial as an anti-cancer agent, provided fundamental insight on the stability of collagen and other proteins, and developed processes to synthesize proteins and convert biomass into useful fuels and chemicals. Our alumni (41 Ph.D. recipients; 22 postdoctorates) are faculty members at distinguished research universities, medical schools, and colleges (22/63); and research scientists at government laboratories and leading corporations.

**B. Positions and Honors**

**Positions**

<table>
<thead>
<tr>
<th>Year</th>
<th>Position</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989–1995</td>
<td>Assistant Professor of Biochemistry</td>
<td>University of Wisconsin–Madison</td>
</tr>
<tr>
<td>1995–1998</td>
<td>Associate Professor of Biochemistry</td>
<td>University of Wisconsin–Madison</td>
</tr>
<tr>
<td>1998–</td>
<td>Professor of Biochemistry and Chemistry</td>
<td>University of Wisconsin–Madison</td>
</tr>
<tr>
<td>2000–</td>
<td>Founder</td>
<td>Quintessence Biosciences, Inc.</td>
</tr>
<tr>
<td>2009</td>
<td>Visiting Associate in Chemistry</td>
<td>California Institute of Technology</td>
</tr>
<tr>
<td>2011–</td>
<td>Founder</td>
<td>Hyrax Energy, Inc.</td>
</tr>
</tbody>
</table>

**Honors**

<table>
<thead>
<tr>
<th>Year</th>
<th>Honor</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986–1989</td>
<td>Postdoctoral Fellowship</td>
<td>Helen Hay Whitney Foundation</td>
</tr>
<tr>
<td>1990–1993</td>
<td>Searle Scholar Award</td>
<td>Chicago Community Trust</td>
</tr>
<tr>
<td>1990–1995</td>
<td>Presidential Young Investigator Award</td>
<td>National Science Foundation</td>
</tr>
<tr>
<td>1991–1994</td>
<td>Junior Faculty Research Award</td>
<td>American Cancer Society</td>
</tr>
<tr>
<td>1991–1996</td>
<td>Shaw Scientist Award</td>
<td>Milwaukee Foundation</td>
</tr>
<tr>
<td>1998</td>
<td>Pfizer Award</td>
<td>American Chemical Society</td>
</tr>
<tr>
<td>2001–2002</td>
<td>Guggenheim Fellowship</td>
<td>J. S. Guggenheim Memorial Foundation</td>
</tr>
<tr>
<td>2002</td>
<td>AAAS Fellow</td>
<td>American Association for the Advancement of Science</td>
</tr>
<tr>
<td>2004</td>
<td>Arthur C. Cope Scholar Award</td>
<td>American Chemical Society</td>
</tr>
<tr>
<td>2005</td>
<td>Emil Thomas Kaiser Award</td>
<td>Protein Society</td>
</tr>
<tr>
<td>2006</td>
<td>RSC Fellow</td>
<td>Royal Society of Chemistry (London)</td>
</tr>
<tr>
<td>2007</td>
<td>Rao Makineni Lectureship</td>
<td>American Peptide Society</td>
</tr>
<tr>
<td>2010</td>
<td>Repligen Award</td>
<td>American Chemical Society</td>
</tr>
<tr>
<td>1989–1994</td>
<td>Steenbock Career Development Award</td>
<td>University of Wisconsin–Madison</td>
</tr>
<tr>
<td>1992–</td>
<td>Hilldale Fellowships (16)</td>
<td>University of Wisconsin–Madison</td>
</tr>
<tr>
<td>1995</td>
<td>Pound Research Award</td>
<td>University of Wisconsin–Madison</td>
</tr>
<tr>
<td>1998–2003</td>
<td>H. I. Romnes Faculty Fellow</td>
<td>University of Wisconsin–Madison</td>
</tr>
</tbody>
</table>
2002–2004 Vilas Associates Award University of Wisconsin–Madison
2006– Henry Lardy Professor of Biochemistry University of Wisconsin–Madison
2009–2014 Kellett Mid-Career Award University of Wisconsin–Madison

Federal Government Public Advisory Committees
1995– Ad Hoc Grant Reviewer, National Science Foundation
1997– Ad Hoc Study Section Member, National Institutes of Health
2005–2009 Member, Synthetic & Biological Chemistry (SBCB) Study Section, National Institutes of Health
2007–2009 Chair, Synthetic & Biological Chemistry (SBCB) Study Section, National Institutes of Health

C. 15 Selected Peer-reviewed Publications (2011 only. Total publications and abstracts: 372.)

D. Research Support

R01 AR044276 11–15  Raines (PI)  04/01/2008–03/31/2013  0.9 acad mo/yr

NIH / NIAMS

Chemistry and Biology of Collagen

The major goal of this project is to reveal the chemical basis for the unique triple-helical structure of collagen, and the roles of collagen in human health and disease.

Role: PI

R01 CA073808 12–16  Raines (PI)  12/01/2008–11/30/2013  0.9 acad mo/yr

NIH / NCI

Ribonucleases in Cancer Chemotherapy

The major goal of this project is to develop a new class of cancer chemotherapeutics based on the cytotoxicity of homologues and variants of bovine pancreatic ribonuclease (RNase A).

Role: PI

R01 GM044783 14–17  Raines (PI)  04/01/2009–03/31/2013  0.9 acad mo/yr

NIH / NIGMS

Protein Chemistry

The major goal of this project is to develop the Staudinger ligation and other chemical reactions for the total synthesis and semisynthesis of proteins.

Role: PI

CHE-1124944  Raines (PI)  10/01/2011–09/30/2014  0.45 acad mo/yr

NSF


The major goal of this project is to probe the ability of $n \rightarrow \pi^*$ interactions between adjacent main-chain carbonyl groups in mediating the conformational stability of proteins.

Role: PI along with Derek N. Woolfson (University of Bristol, UK)

R01 CA108467 05–09  Abbott (PI)  07/01/2009–06/30/2014  0.23 acad mo/yr

NIH / NCI

Biomolecular Analysis using Liquid Crystals

The major goal of this project is to develop the ability to use liquid crystals to identify and quantitate biomolecules in complex mixtures, focusing on epidermal growth factor and the epidermal growth factor receptor.

Role: co-PI

Bioenergy Research Center  Donohue (PI)  10/01/2007–10/30/2012  0.9 acad mo/yr

DOE

Great Lakes Bioenergy Research Center

Role: co-PI; Project Leader in Thrust 3: Bioconversion

Pending Research Support: None.

Completed Research Support: None.
Biographical Sketch: John Ralph
Departments of Biochemistry, and Biological Systems Engineering, and
DOE Great Lakes Bioenergy Research Center
University of Wisconsin, Madison, WI

Educational Background

Professional Experience
1988-1995  Assistant Professor, Department of Forestry, U. Wisconsin-Madison.
2008-present  Full Professor, Dept. of Biochemistry, U. Wisconsin-Madison
2008-present  ‘Improved Plant Biomass’ Area Leader, Great Lakes Bioenergy Research Center.

Other Professional Appointments
2007-present  Editorial Board, \textit{BioEnergy Research}
2006-present  Editorial Board, \textit{J. Wood Chemistry and Technology}
2003-present  Editorial Board, \textit{Holzforschung}
2000-present  Editorial Board, \textit{J. Science of Food and Agriculture}
2007-present  Scientific Advisory Board, FuncFiber, Umeå, Sweden
2008-present  Area 1 (Improving Plant Biomass) leader, Great Lakes Bioenergy Research Center
2008-present  Scientific Advisory Board, Joint BioEnergy Institute (JBEI), Berkeley, CA
2010-present  International Advisory Board for the \textit{Journal of Wood Science} (Japan Wood Soc.)

Specialization and Areas of Professional Experience
• General plant cell wall (CW) chemistry/biochemistry.
• Lignin Biosynthesis (including pathway delineation), Lignin Chemistry, Lignin Reactions.
• Synthesis of biosynthetic products, precursors, intermediates, molecular markers, cell wall model compounds, etc.
• Solution-state NMR (particularly of CW components, especially lignins); methods development.
• Cell wall cross-linking mechanisms.
• Methods for wall structural analysis (chemical/degradative, NMR, GC-MS, etc.).

Recent Awards
2008  Article entitled “Lignin Biosynthesis” in \textit{Annual Review of Plant Biology} (2003) identified by Thomson Reuters’ Essential Science Indicators as one of the most cited papers.
2007  Selected by the Institute for Scientific Information (ISI) for HighlyCited.com because of “exceptional citation count in the field of Agricultural Science.”
2005  Elected *Fellow of the American Association for the Advancement of Science* (AAAS)
Publications (ten related to the proposal, selected from last 5 years)

Book Chapters (Refereed)

NMR of Lignins.
J. Ralph and L.L. Landucci.

Quinone methides in lignification.

Lignification: Are lignins biosynthesized via simple combinatorial chemistry or via proteinaceous control and template replication?

Lignins.
J. Ralph, G. Brunow and W. Boerjan

Perturbing Lignification.
J. Ralph.

What makes a good monolignol substitute?
J. Ralph.

Publications (refered)


Suppression of CCR changes metabolite profile and cell wall composition in *Pinus radiata* tracheary elements.

Effects on lignin structure of coumarate 3-hydroxylase downregulation in Poplar.

Rapid syntheses of dehydrodiferulates via biomimetic radical coupling reactions of ethyl ferulate.

Biosynthesis and incorporation of side-chain-truncated lignin monomers to reduce lignin polymerization degree and enhance saccharification efficiency in Arabidopsis stems.
Comparison of cell-wall components of different wood types in juvenile trees of *Pinus radiata* and their relationships to physical properties.
M. Brennana, J.P. McLeana, C. Altanera, J. Ralph and P.J. Harris.

An engineered monolignol 4-O-methyltransferase represses lignin polymerization and confers novel metabolic capability *in planta*.

Hydroxycinnamate conjugates as potential monolignol replacements: *in vitro* lignification and cell wall studies with rosmarinic acid.

Identification of a grass-specific enzyme that acylates monolignols with *p*-coumarate.

Synthesis of 3-O-vanillate and 3-O-ferulate esters of (-)-epicatechin.
D.K. Ress and J. Ralph.

Incorporation of epicatechin derivatives into cell walls, and assessment of responses to pretreatment methods and subsequent enzymatic hydrolysis.
S. Elumalai, J.H. Grabber, J. Ralph and X. Pan.

Facile synthesis of 4-hydroxycinnamaldehydes.
Y. Zhu, A. Mohammadi and J. Ralph.

Independent recruitment of an *O*-methyltransferase for syringyl lignin biosynthesis in *Selaginella moellendorffii*.

Molecular and biochemical basis for stress-induced accumulation of free and bound *p*-coumaraldehyde in *Cucumis sativus*.

Independent recruitment of an *O*-methyltransferase for syringyl lignin biosynthesis in *Selaginella moellendorffii*.

Solution-state NMR of lignocellulosic biomass.
F. Lu and J. Ralph.

Reactions of dehydrodiferulates with ammonia.
A. Azarpira, F. Lu and J. Ralph.

The charophycean green algae provide insights into early origins of plant cell walls.
Stereoselective synthesis of 1-O-β-feruloyl and 1-O-β-sinapoyl glucopyranoses.
Y. Zhu and J. Ralph.

Multidimensional NMR analysis reveals truncated lignin structures in wood decayed by the brown rot basidiomycete *Postia placenta*.
D.J. Yelle, D. Wei, J. Ralph and K.E. Hammel.

D.J. Yelle, J. Ralph and C.R. Frihart.

D.J. Yelle, J. Ralph and C.R. Frihart.

Significant alteration of gene expression in wood decay fungi *Postia placenta* and *Phanerochaete chrysosporium* by plant species.

CCoAOMT suppression modifies lignin composition in *Pinus radiata*.

Fluorescence-tagged monolignols: Synthesis and application to studying in vitro lignification.
Y. Tobimatsu, C.L. Davidson, J.H. Grabber and J. Ralph.

Lignin composition and structure in young versus adult *Eucalyptus globulus* plants.

The DUF579 domain containing proteins IRX15 and IRX15-L affect xylan synthesis in Arabidopsis.

Multi-scale visualization and characterization of lignocellulosic plant cell wall deconstruction during thermochemical pretreatment.

Isolation of cellulolytic enzyme lignin from wood pre-swollen/dissolved in dimethyl sulfoxide/N-methylimidazole.
A. Zhang, F. Lu, R. Sun and J. Ralph.
*Journal of Agricultural and Food Chemistry*, 58(6), 3446-3450 (2010).

Comparative transcriptome and secretome analysis of wood decay fungi *Postia placenta* and *Phanerochaete chrysosporium*.
*Applied and Environmental Microbiology*, 76(11), 3599-3610 (2010).
Convergent evolution of syringyl lignin biosynthesis via distinct pathways in the lycophyte Selaginella and flowering plants.

Engineering traditional monolignols out of lignins by concomitant up-regulation F5H1 and down-regulation of COMT in Arabidopsis
*The Plant Journal*, 64(6), 885-897 (2010).

Lignin biosynthesis and structure.

Modeling lignin polymerization. I. Simulation model of dehydrogenation polymers.

Advances in modifying lignin for enhanced biofuel production.
B.A. Simmons, D. Loqué and J. Ralph.  

Comparative study of SPORL and dilute-acid pretreatments of spruce for cellulosic ethanol production.
*Bioresource Technology*, 101(9), 3106-3114 (2010).

Hydroxycinnamates in Lignification.
J. Ralph.  

Mass-spectrometry-based fragmentation as an identification tool in lignomics.
*Analytical Chemistry*, 82(19), 8095-8105 (2010).

Mass-spectrometry-based sequencing of lignin oligomers.

Sequencing around 5-hydroxyconiferyl alcohol-derived units in caffeic acid O-methyltransferase-deficient poplar lignins.

Solution-state 2D NMR of ball-milled plant cell wall gels in DMSO-d₆/pyridine-d₅.
H. Kim and J. Ralph.  

Identifying new lignin bioengineering targets: 1. Monolignol substitute impacts on lignin formation and cell wall fermentability.
*BMC Plant Biology*, 10(114), 1-13 (2010).

Understanding the impact of ionic liquid pretreatment on eucalyptus.

Ferulate-coniferyl alcohol cross-coupled products formed by radical coupling reactions.
A. Zhang, F. Lu, R. Sun and J. Ralph. 

Suppression of 4-Coumarate-CoA Ligase in the Coniferous Gymnosperm Pinus radiata.

Monoclonal antibodies to p-coumarate.

2D-NMR (HSQC) difference spectra between specifically $^{13}$C-enriched and unenriched protolignin of *Ginkgo biloba* obtained in the solution-state of whole cell wall material.

The effects on lignin structure of overexpression of ferulate 5-hydroxylase in hybrid poplar.
*Plant Physiology*, 150(2), 621-635 (2009).

Discovery of lignin in seaweed reveals convergent evolution of cell-wall architecture.

Identification of Lignin and Polysaccharide Modifications in Populus Wood by Chemometric Analysis of 2D NMR Spectra from Dissolved Cell Walls.

Grass lignin acylation: p-coumaroyl transferase activity and cell wall characteristics of C3 and C4 grasses.

Cell wall fermentation kinetics are impacted more by lignin content and ferulate cross-linking than by lignin composition.
J.H. Grabber, D.R. Mertens, H. Kim, C. Funk, F. Lu and J. Ralph. 

Evidence for cleavage of lignin by a brown rot basidomycete.
D.J. Yelle, J. Ralph, F. Lu and K.E. Hammel. 

Characterization of non-derivatized plant cell walls using high-resolution solution-state NMR spectroscopy.
D.J. Yelle, J. Ralph and C.R. Frithart. 

Lignin engineering.

Identification of the structure and origin of a thioacidolysis marker compound for ferulic acid incorporation into angiosperm lignins (and an indicator for cinnamoyl-CoA reductase deficiency).
Novel tetrahydrofuran structures derived from β–β-coupling reactions involving sinapyl acetate in Kenaf lignins.
F. Lu and J. Ralph.

Solution-state 2D NMR of Ball-milled Plant Cell Wall Gels in DMSO-d₆.
H. Kim, J. Ralph and T. Akiyama.

A potential role of sinapyl p-coumarate as a radical transfer mechanism in grass lignin formation.
R.D. Hatfield, J. Ralph and J.H. Grabber.

Coniferyl ferulate incorporation into lignin enhances the alkaline delignification and enzymatic degradation of maize cell walls.
J.H. Grabber, R.D. Hatfield, F. Lu and J. Ralph.
*Biomacromolecules*, 9(9), 2510-2516 (2008).

Isolation and characterisation of a coffee melanoidin fraction.
D. Gniechwitz, N. Reichardt, J. Ralph, M. Blaut, H. Steinhart and M. Bunzel.

Characterization and fermentability of an ethanol soluble high molecular weight coffee fraction.
D. Gniechwitz, N. Reichardt, E. Meiss, J. Ralph, H. Steinhart, M. Blaut and M. Bunzel.

Stone fruit stones: A model system for studying lignin biosynthesis and regulation.
C. Dardick, A. Callahan, R. Scorza, R. Chiozzotto, J. Ralph and R. Schaffer.

Peroxidase-catalyzed oligomerization of ferulic acid esters.
M. Bunzel, B. Heuermann, H. Kim and J. Ralph.

Cross-linking of arabinoxylans via 8-8-coupled diferulates as demonstrated by isolation and identification of diarabinosyl 8-8(cyclic)-dehydrodiferulate from maize bran.
M. Bunzel, E. Allerdings, J. Ralph and H. Steinhart.

Molecular phenotyping of lignin-modified tobacco reveals associated changes in cell wall metabolism, primary metabolism, stress metabolism and photosynthesis.

Exploring lignification in conifers by silencing hydroxycinnamoyl-CoA:shikimate hydroxycinnamoyltransferase in Pinus radiata.

Downregulation of cinnamoyl coenzyme A reductase in poplar; multiple-level phenotyping reveals effects on cell wall polymer metabolism and structure.
Related Arabidopsis serine carboxypeptidase-like sinapoylglucose acyltransferases display distinct but overlapping substrate specificities.

NMR studies on the occurrence of spirodienone structures in lignins.

Synthesis and identification of 2,5-bis-(4-hydroxy-3-methoxyphenyl)-tetrahydrofuran-3,4-dicarboxylic acid, an unanticipated ferulate 8–8-coupling product acylating cereal plant cell walls.

Effects of coumarate-3-hydroxylase downregulation on lignin structure.

Genetical metabolomics of flavonoid biosynthesis in Populus: a case study.

Non-enzymatic reduction of quinone methides during oxidative coupling of monolignols: implications for the origin of benzyl structures in lignins.

Structural identification of dehydrotriferulic and dehydrotetraferulic acids isolated from insoluble maize fiber

NMR characterization of lignins isolated from fruit and vegetable insoluble dietary fiber.

Isolation and structural identification of complex feruloylated heteroxylan side-chains from maize bran.

**Patent Applications**

**Methods of Modifying Lignin Structure**

**Methods for modifying lignin structure using monolignol ferulate conjugates**
J. Ralph, R.D. Hatfield, J.H. Grabber, F. Lu, C. Wilkerson.

**Feruloyl-CoA:Monolignol Transferase**
C. Wilkerson, J. Ralph, S. Withers
U.S. patent application No. 61/366,977 [2010]
Full patent: PCT/US2011/044981
[Also C. Wilkerson, J. Ralph, S. Withers, S. D. Mansfield
Full patent: PCT/US2011/045044]
Incorporation of flavan-3-ols and gallic acid derivatives into lignin to improve biomass utilization
J. Grabber, J. Ralph
US 61/325,695 (provisional, Full patent just filed 3/2011, no number yet)

Identification of a grass-specific enzyme that acylates monolignols with $p$-coumarate
C. Wilkerson, S. Withers, J. Ralph
WARF P120040US01, MSU TEC2012-0016
BIOGRAPHICAL SKETCH

NAME
Ivan Rayment

POSITION TITLE
Professor of Biochemistry

eRA COMMONS USER NAME (credential, e.g., agency login)
IRAYMENT

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YYYY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Durham</td>
<td>B. Sc.</td>
<td>1972</td>
<td>Chemistry</td>
</tr>
<tr>
<td>University of Durham</td>
<td>Ph. D.</td>
<td>1975</td>
<td>Chemistry</td>
</tr>
</tbody>
</table>

NOTE: The Biographical Sketch may not exceed four pages. Follow the formats and instructions on the attached sample.

A. Personal Statement
Dr. Rayment has a long track record of outstanding productivity in the area of protein structure and function. Over the past twenty years at Wisconsin he has made seminal contributions to our understanding of molecular motors, DNA transposition, molecular evolution, and enzyme mechanism, to name but a few of his research interests. Indeed, his early studies of myosin defined the first molecular mechanism for how chemical energy is converted into directed movement in skeletal muscle. Fundamentally, his research studies are directed at understanding how proteins function at the molecular level. He has very broad interests which allows him to bring a perspective that encompasses a wide range biochemistry and structural biology. As such he is well suited to participate as a project leader in this program project grant that is directed towards understanding the molecular role of myosin in cardiac function in both the normal and diseased heart.

B. Positions and Honors
9/72-6/75: Teaching Assistant, Durham University, Durham, England
8/75-8/78: Postdoctoral Research Associate, Department of Biological Sciences, Purdue University, West Lafayette, IN 47907
8/78-10/84: Senior Research Associate, Laboratory of Structural Biology, Rosenstiel Basic Medical Sciences Research Center, Brandeis University, Waltham, MA 02254
10/84-7/88: Assistant Professor, Department of Biochemistry, University of Arizona, Tucson, AZ 85721
7/88-6/94: Associate Professor of Biochemistry and Co-Director of the Institute for Enzyme Research, University of Wisconsin, Madison, WI 53705
7/94-7/2000: Co-Director of the Institute for Enzyme Research, Univ. Wisconsin, Madison, WI 53705
7/94-present: Professor of Biochemistry, University of Wisconsin, Madison, WI 53706

University of Durham Scholarship, 1970-71 and 1971-72
NIH Fellowship No. 1 F32 AI05600-01, 9/1/78-8/31/79
Young Investigators Research Grant No. 5 R23 CA27260-02, 9/30/79-9/30/82
Established Investigator of the American Heart Association, 7/85-6/90
Romnes Faculty Fellowship, 3/92.
Fellow of the American Association for the Advancement of Science, 1998
University of Wisconsin, Vilas Award 1999-2001
Kellet Mid-Career Award, University of Wisconsin, 2003-2008.
Fellow of the Biophysical Society, 2008
C. Selected peer-reviewed publications. (From a total of 189)


D. Research Support

Ongoing Research Support

**R01 GM086351-24 (Formerly AR035186) Rayment (PI) 9/30/09 - 9/30/11**

NIH/NIAMS
Structural Studies of Myosin Motor Proteins

The goal of this proposal is to determine the structure and function of myosin and kinesin.

Role: PI

1R01 GM083987 Rayment (PI) 12/01/2008-11/30/2013
Structure Function Studies of the Spindle Pole Body in Saccharomyces Cerevisiae

Role PI

The goal of this proposal is to understand the molecular architecture of microtubule organizing centers. These massive organelles play a central role in mitosis. In the budding yeast S. cerevisiae the microtubule organizing center is known as the spindle pole body. Even though the composition of the SPB is well defined, little is known about its molecular structure. Recent developments in the expression of proteins associated with coiled-coils pioneered by the Rayment laboratory have allowed the expression and purification of all of the central components in a form suitable for structural and biophysical study. Although this work has no overlap with the present proposal, it creates an intellectual environment that is supportive of the investigation of myosin motor domains.

59-0790-6-666 Rayment (PI) 5/26/011 - 5/27/12
AGRICARS
Structural and Functional Studies of Trichothecone Biosynthetic Enzymes

Role: PI (No overlap)

The overall goal of this proposal is to obtain fundamental structural and biochemical knowledge about the enzymes responsible for trichothecene biosynthesis in F. sporotrichioides and F. graminearum with the goal of establishing the intellectual framework for creating improved agents for inactivating the mycotoxins responsible for the damage caused by Fusarium Head Blight.

Pending Research Support

1R21HL111237-01 Rayment (PI) 12/01/011 – 11/30/2013
Structural framework for understanding myosin thick-filament assemblies

The overall goal of this proposal is to gain fundamental structural knowledge into the arrangement of the myosin rod in cardiac and smooth muscle thick filaments.

Role: PI
BIOGRAPHICAL SKETCH

NAME
Record, M. Thomas, Jr.

POSITION TITLE
Professor

eRA COMMONS USER NAME (credential, e.g., agency login)
mtrecord

EDUCATION/TRAINING  (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yale University, New Haven, CT</td>
<td>B.A.</td>
<td>06/64</td>
<td>Chemistry summa cum laude</td>
</tr>
<tr>
<td>University of California – San Diego</td>
<td>Ph.D.</td>
<td>06/67</td>
<td>Biophysical Chemistry</td>
</tr>
<tr>
<td>University of California – San Diego</td>
<td>Postdoctoral</td>
<td>06/68</td>
<td>Biophysical Chemistry</td>
</tr>
<tr>
<td>Stanford University, Palo Alto, CA</td>
<td>Postdoctoral</td>
<td>08/70</td>
<td>Biochemistry</td>
</tr>
</tbody>
</table>

A) Personal Statement:

The research proposed here is highly interdisciplinary, and my background, interests and accomplishments are also interdisciplinary spanning the range of biophysical, biochemical and molecular biological studies from in vivo to in vitro to in silico. I am an elected fellow of academies or societies in biochemistry (Amer. Acad. of Arts and Sciences), biophysics (Biophysical Society), microbiology (Amer. Acad. of Microbiology), and chemistry (Amer. Assoc. for Advancement of Science). I have a track record of significant accomplishments in determining the mechanism, thermodynamic driving forces, and coupled conformational changes in formation of initiation-competent RNA polymerase-promoter open complexes. Our recent novel applications of rapid mix – quench kinetics, rapid burst perturbations to generate unstable intermediates, and fast footprinting with single base resolution are determining the mechanism of open complex formation, not known for any cellular RNA polymerase, as well as suggesting new avenues of transcription regulation of general applicability to all RNA polymerases. Of particular significance for this research is the synergy in the laboratory between this research into the mechanism of transcription initiation (GM23467) and our development of quantitative interpretations and predictive capability for effects of solutes and salts on protein and nucleic acid processes (GM47022). Our development of solutes as quantitative probes of large scale changes in biopolymer surface allow us to use urea, glycine betaine, glutamate vs chloride and other solutes and salts as quantitative probes of coupled folding (urea), as well as of burial of DNA phosphates and/or protein carboxylates in interfaces (GB), coulombic interactions in interfaces (salts) and burial of hydrocarbon surface (e.g. glutamate vs chloride) that occur in individual steps of the RNA polymerase – promoter mechanism.

B) Positions and Honors

University of Wisconsin - Madison Appointments
1970-1976  Assistant Professor of Chemistry
1976-1980  Associate Professor of Chemistry
1980-1982  Professor of Chemistry
1982-1990  Professor of Chemistry and Biochemistry
1990-present  John D. Ferry Professor of Chemistry and Biochemistry
2002-present  Steenbock Professor in Chemical Sciences

Awards
1964-1967  NSF Graduate Fellow
1968-1970  NSF Postdoctoral Fellow
1976Phi  Beta Kappa Teaching Award, Univ. Wisconsin
1986 UW  Faculty Teaching Award
1991    WARF-University Houses Professorship
1991         Fellow, Amer. Assoc. for Advancement of Science
1997-2006   NIH Merit Award
1998-2000   UW Vilas Associate Award
2001    Biophysical Society Founders Award
2002    Steenbock Professorship

**Professional Memberships**
2006    Fellow, Biophysical Society
2007         Member, American Academy of Arts and Sciences
2009    Member, American Academy of Microbiology
2009    Hugh Huffman Award, Calorimetry Conference

I was the inaugural Stanley Gill Memorial Lecturer at the University of Colorado (1994), the keynote lecturer at the Biopolymers Gordon Research Conference (1994), and a keynote lecturer at the Lorne Conference on Protein Structure and Function, Lorne, Australia (1994). I was the Dupont Distinguished Lecturer at the University of Indiana (1995), the Ernest C. Pollard Lecturer in Biophysics at Pennsylvania State University (1996), and the Mississippi Chemical Lecturer in Chemical Sciences at the University of Mississippi (2000). I presented the Founders Award Lecture, Biophysical Society (2001), the Huffman Award Lecture at the 64th Calorimetry Conference (2009) and keynote lectures at the inaugural Gordon Research Conference on the Biology and Biophysics of Osmoregulation (2003) and the 59th Calorimetry Conference (2004). In 2012 I will be the keynote speaker at the inaugural meeting of the Biophysical Society In Vivo subgroup and at the Faraday Society Discussion of Hofmeister Ion and Solute Effects.

I have served on the editorial boards of the Journal of Biological Chemistry, Biopolymers, the International Journal of Biological Macromolecules and the Biophysical Journal. I was a member of the NIH BBCA Study Section, and have served as an ad hoc member of special study sections, BBCA, Biochemistry, and most recently MSFC study section.

**C. Selected Recent Publications and Review Articles:**

**Mechanism of Open Complex Formation and Transcription Initiation**


5. W. S. Kontur, R. M. Saecker, M. W. Capp and M. T., Record, Jr. Late Steps in the Formation of *E. coli* RNA Polymerase- AP_R Promoter Open Complexes: Characterization of Conformational Changes by


**Establishing the Use of Solutes and Hofmeister Salts as Quantitative Probes of Large Scale Conformational Changes and Formation of Large Interfaces in Steps of Biochemical Processes**


**Recent Research Advances with Nucleoid Associated Proteins and In Vivo**


D. Research Support

Ongoing Research Support

NIH-5-R01-GM-23467-34S1          Record (PI)             1/1/07-8/31/12
Large Scale Conformational Changes in Regulation of Transcription Initiation. The goal of this project is to characterize the succession of large scale conformational changes involved in forming and stabilizing the open complex in transcription initiation at the λP_R promoter by wild-type E. coli RNA polymerase (WT RNAP), using kinetic-mechanistic studies and chemical or enzymatic footprinting. Nucleoid-associated DNA binding proteins (histone analogs IHF, HU) that affect transcription initiation by bending DNA (with (IHF) or without (HU) wrapping DNA) have also been investigated. Bridge funding has been received for the period 9/11-8/12 to permit us to continue the characterization of large scale conformational changes in WT RNAP and λP_R promoter DNA while we reapply for support of these research projects.
Role: PI

NIH-2-R01-GM47022-17          Record (PI)             12/1/09-11/30/13
Developing Solutes As Structural/Mechanistic Probes of Protein-DNA Interactions. The goal of this project is to relate effects of the spectrum of small solutes (Hofmeister salts, denaturants, osmolytes) on protein-DNA interactions and other biopolymer processes to structural data on the biopolymer surface area exposed or buried in those processes, using a quantitative thermodynamic analysis based on the partitioning of the solute between the local water of hydration of those biopolymer surfaces and bulk water. Research advances on this project have allowed us to use solutes and Hofmeister salts as quantitative probes of large scale conformational changes in the steps of transcription initiation by E. coli RNA polymerase.
Role: PI

Completed Research Support

NIH-3-R01-GM47022-16 S1          Record (PI)             10/09-3/31/10
ARRA Supplement to Solute Effects on Biopolymer Processes. This supplement to a no cost extension of GM47022 allowed us to continue the research on solute effects during a gap in funding. The goal of this supplement, in large part accomplished, was to provide a quantitative basis for predicting and interpreting effects of the common E. coli osmolytes (including the Hofmeister salt Kglutamate, the disaccharide trehalose, and the amino acids proline and N,N,N-trimethyl glycine (glycine betaine)) on protein processes in terms of structural data on the protein surface area exposed or buried in those processes. Thermodynamic data for the interactions of these solutes with model compounds displaying the common functional groups of proteins were obtained by solubility and osmometry and used as the data base for this quantitative analysis.
Role: PI
BIOGRAPHICAL SKETCH

NAME
Reed, George H.

POSITION TITLE
Professor of Biochemistry

eRA COMMONS USER NAME
GHREED

EDUCATION/TRAINING  (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purdue University, W. Lafayette, IN</td>
<td>B. S.</td>
<td>1964</td>
<td>Chemistry</td>
</tr>
<tr>
<td>University of Wisconsin–Madison, WI</td>
<td>Ph. D.</td>
<td>1968</td>
<td>Chemistry</td>
</tr>
<tr>
<td>University of Pennsylvania, Phila, PA</td>
<td>Postdoctoral</td>
<td>1968-1971</td>
<td>Biophysics &amp; Biochemistry</td>
</tr>
</tbody>
</table>

A. Positions and Honors

1967-1968: Lecturer, Department of Chemistry University of Wisconsin
1971-1985: Assistant, Associate, and Full Professor, Department of Biochemistry and Biophysics, University of Pennsylvania School of Medicine, Phila, PA
1985-2000 Chair Section III and Co-Director, Institute for Enzyme Research, University of Wisconsin--Madison
1985-present Professor, Department of Biochemistry, University of Wisconsin--Madison
1986-2001: Executive Editor, Archives of Biochemistry and Biophysics
2002-present: Editorial Advisory Board, Biochemistry
1991-1995 Member, Biochemistry Study Section NIH
1993-1995: Chair, Biochemistry Study Section NIH
1998: Member, Special Emphasis Panel and Postdoctoral Fellowships Review Panel, NIH
2001: Chair, Special Emphasis Panel, NIH
1986: Co-Chair, Gordon Research Conference on Enzymes, Coenzymes and Metabolic Pathways
1990-1993: Councillor, Biological Chemistry Division, American Chemical Society
Member: American Chemical Society, ASBMB, International EPR Society
2003: Co-organizer 29th Steenbock Symposium on Coenzymes, Cofactors and Catalysis
NIH Postdoctoral Fellowship 1969-1970
NIH Career Development Award, 1972-1976


BIOGRAPHICAL SKETCH

NAME
Senes, Alessandro

POSITION TITLE
Assistant Professor of Biochemistry

eRA COMMONS USER NAME (credential, e.g., agency login)
SENES01

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Università di Sassari, Sassari, Italy</td>
<td>BS</td>
<td>1991</td>
<td>Biology</td>
</tr>
<tr>
<td>Yale University, New Haven, CT</td>
<td>MPhil</td>
<td>1996</td>
<td>Mol. Biophys. &amp; Biochem.</td>
</tr>
<tr>
<td>Yale University, New Haven, CT</td>
<td>PhD</td>
<td>2001</td>
<td>Mol. Biophys. &amp; Biochem.</td>
</tr>
<tr>
<td>Massachusetts Inst. of Technology, Cambridge MA</td>
<td>Postdoc</td>
<td>2001-2003</td>
<td>Artificial Intelligence</td>
</tr>
</tbody>
</table>

A. Personal Statement
My primary interest is understanding the rules that govern protein folding and interaction. My laboratory studies the interactions between membrane proteins using an integration of biophysical and computational methods. Throughout my career I have used biophysical techniques and advanced computational methods (bioinformatics and molecular modeling) to identify important protein interaction motifs, to predict protein structure and to design active proteins de novo. My laboratory develops methods and algorithms for protein modeling and design. Our software written “in house” using our own molecular modeling codebase (the MSL libraries), which includes all the major modeling and analysis algorithms (energetic analysis, side chain repacking and mutagenesis, backbone generation and motion, geometric transformations, etc.) and allows us to rapidly produce custom methods for any specific modeling or analysis problem. MSL is in continuous development and is made available to the public in its latest version at http://msl-libraries.org.

B. Positions and Honors. List in chronological order previous positions, concluding with your present position. List any honors. Include present membership on any Federal Government public advisory committee.

Professional Experience:
1989 Undergraduate thesis, Università di Sassari, Sassari, Dept. of Applied Biology, advisor G.M.Cherchi
1992 Laboratory technician, Università di Sassari, Sassari, Dept. of Applied Biology, advisor G.M.Cherchi
1993 Graduate student, Università di Sassari, Sassari, Dept. of Applied Biology, advisor G.M.Cherchi
1994 Graduate student, Yale University, Dept of Molec. Biophysics & Biochemistry, advisor D.M. Engelman
2001 Postdoctoral Study, Massachusetts Institute of Technology, Artificial Intelligence Lab, advisor Bruce Tidor
2004 Postdoctoral Study, University of Pennsylvania, Dept of Biochemistry & Biophysics, advisor W.F DeGrado
2008 Assistant Professor, University of Wisconsin—Madison, Biochemistry

Honors and Awards:
1990 IBM, Computer Science Summer School Fellowship
1993 MURST pre-doctoral fellow (Ministero dell'Università e Ricerca)

C. Selected peer-reviewed publications. Do not include publications submitted or in preparation. For publicly available citations, URLs or PMC submission identification numbers may accompany the full reference; copies of publicly available publications are not accepted as appendix material.


15. Subramaniam S, Natarajan S, **Senes A** "A Machine Learning based Approach to Improve Protein Sidechain Optimization", ACM Conference on Bioinformatics, Computational Biology and Biomedicine (ACM BCB) 2011, in press


**D. Research Support.** List selected ongoing or completed (during the last three years) research projects (federal and non-federal support). Begin with the projects that are most relevant to the research proposed in this application. Briefly indicate the overall goals of the projects and your role (e.g. PI, Co-Investigator, Consultant) in the research project. Do not list award amounts or percent effort in projects.

1. Steenbock Career Advancement
   PI Senes, $525,000.00 Award dates: 08/25/2008 – 08/25/2013

2. USDA, HATCH
   *Study on the in vitro association properties of the bacterial division proteins FtsQ, FtsB and FtsL*
   PI Senes, $57,469 Award dates: 10/01/2009 – 09/30/2011 (Completed)

3. Graduate School
   *Development of Enhanced Conformational Sampling strategies for Side-Chain Optimization*
   PI Senes, $34,418 Award dates: 07/01/2011 – 06/30/2012
BIOGRAPHICAL SKETCH

NAME
Michael R. Sussman

POSITION TITLE
Professor, UW Dept. of Biochemistry
Director, UW Biotechnology Center

eRA COMMONS USER NAME (credential, e.g., agency login)
msussman30

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>MM/YY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bucknell University</td>
<td>B.S.</td>
<td>1971</td>
<td>Biology</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>Ph.D</td>
<td>1976</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Yale University (Biology Dept.)</td>
<td>Postdoc</td>
<td>1977-79</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Yale Med. School (Dept. Human Genetics)</td>
<td>Postdoc</td>
<td>1979-82</td>
<td>Genetics/Biochemistry</td>
</tr>
</tbody>
</table>

A. Personal Statement

Dr. Sussman is Director of the Biotechnology Center at UW-Madison and a Professor in the Dept. of Biochemistry. His laboratory is known for studies on the bioenergetics of proteins in the plasma membrane of eukaryotes, as well as innovation in the development of systems biology genomic profiling tools, including the invention of a maskless array synthesizer for creating DNA chips on the fly, that was commercialized by NimbleGen Systems, Inc. (now Roche-NimbleGen), a company that he co-founded. In addition to his genomic research with Arabidopsis thaliana (model higher plant), Electrophorus electricus (strong voltage electric eel) his research is now heavily focused on mass spectrometry, particularly in the areas of proteomics and metabolomics and with next generation DNA sequencing. From 2005-2007 he was head PI for an interdisciplinary, NIH funded project devoted to developing new mass spectrometric based metabolomic technology (“Isotope-assisted differential metabolomics”, Grant Numbers 4R33DK070297-02 and 1R21DK070297-01) and has served either as chair or participant on study sections at NIH involved with mass spectrometry and genomic instrumentation. Over the past decade, he has annually attended, chaired a session and presented his laboratory’s research at the annual meeting of the American Society of Mass Spectrometry. The Journal of the American Society of Mass Spectrometry, Analytical Chemistry and Journal of Biological Chemistry are examples of specialized journals where his proteomics and metabolomics work is published. He regularly attends and periodically helps organize local and national meetings on this rapidly evolving technology. His laboratory includes equipment commonly used for proteomic analyses and in 2007, mainly with NSF research grant funds, he was able to purchase an ESI-LTQ-ETD-orbitrap, which is a state of the art platform for discovery-based untargeted quantitative proteomics. In 1998, within the first year after his appointment as Director of the UW Biotechnology Center, he started the Center’s Mass Spectrometry facility, with the campus’s first MS/MS instrument (a triple quadrupole), and he has steadily helped accrue instruments for the facility by writing grants such as this SIG. In 2010 Dr. Sussman appointed Dr. Greg Barrett-Wilt (PhD with Don Hunt in 2002) as director of this important campus core facility, replacing previous director, Dr. Amy Harms, who moved to Holland to run a core facility at the University of Leiden. Most recently, Sussman obtained funds from UW Graduate School to purchase a state of the art triple quadrupole mass spectrometer for targeted proteomics and phosphoproteomics. As Director of the UWBC and overall supervisor of the UWBC core facilities, Dr. Sussman has also recently obtained funds from NIH, UW, and Howard Hughes investigators to establish a next generation DNA sequencing core facility at the UWBC. The facility now includes two HiSeq 2000 Illumina Sequencers, a Roche Sequencer and funds are available to either purchase a third Illumina unit or one from Pacific Biosciences.
B. Positions and Honors

Positions and Employment

1977-1979  Postdoctoral Fellow, Department of Biology, Yale University, New Haven, CT
1979 Visiting Scientist, Shell Development Company, Modesto, CA
1979-1982  Postdoctoral Associate, Department of Human Genetics, Yale Medical School, New Haven, CT (Laboratory of Prof. Carolyn W. Slayman)
1982-1988  Assistant Professor, Cell and Molecular Biology Program, University of Wisconsin, Madison, WI
1988-1992  Associate Professor, Cell and Molecular Biology Program, University of Wisconsin, Madison, WI
1992-2002  Professor, Cell and Molecular Biology Program, University of Wisconsin-Madison
1996-1997  Interim Director, University of Wisconsin Biotechnology Center
1999 Co-Founder, NimbleGen Inc.
1998-2002  Member, Scientific Advisory Board, Large Scale Biology Inc. (Vacaville, CA) 1999-2002 Professor, Department of Genetics, University of Wisconsin
2000-2007  Member, Scientific Advisory Board, NimbleGen Systems, Inc. (Madison, WI)
2002-2007  Member, Advisory Board, Baird Venture Partners (Chicago, IL)
2007-2009  Member, Management Team, DOE Great Lakes Bioenergy Research Center
2005-2009  Member, Scientific Advisory Board, Codon Devices Inc. (Boston, MA)
1997-present  Director, University of Wisconsin Biotechnology Center
2002-present  Professor, Department of Biochemistry, University of Wisconsin
2007-present  Member, Scientific Advisory Board, Genalyte, Inc. (San Diego, CA)

Honors, Awards, Invited Committees

1971-1972  Woodrow Wilson Graduate Fellowship
1972-1975  National Science Foundation Graduate Fellowship
1977  Elizabeth Brown Postdoctoral Fellowship (Yale University)
1978  McKnight Award for Research in Plant Biology
1988  Dept. of Energy Grant Review Panel (Biological Energy Transduction)
1990  Fulbright Sabbatical Research Scholar Award (Belgium)
1990  Member, Editorial Board, ‘New Biologist’
1992-1998  National Science Foundation Grant Review Panel (Cell Biology)
1993-1996  Member, Editorial Board, ‘The Plant Journal’
1996  UW Graduate School Kellett Mid-Career Award
1997-1998  National Science Foundation Grant Review Panel (Signal Transduction)
2000-2003  Elected member, North American Arabidopsis Steering Committee (NAASC)
2001-2003  Elected co-chair, Multinational Arabidopsis Steering Committee (MASC)
2001-present  Appointed to Wisconsin Technology Council by Governor McCallum
2000-2005  Member, Editorial Board, ‘Journal of Biological Chemistry’
2002-2005  Member, Wisconsin Biotechnology Association Board of Directors
2003  National Science Foundation Grant Review Panel (Integrative Plant Biology)
2004  UW Vilas Associate Award
2005  National Science Foundation Grant Review Panel (Metabolic Biochemistry)
2005-2007  Appointed to Wisconsin Biofuels Consortium by Governor Doyle
2005-present  Editor, ‘FEBS Letters’
2005  Elected Fellow of the American Assoc. for the Advancement of Science
2006  Member, DOE Study Section, Biological Sciences Division
2007  Member, NIH Study Section on Mass Spectrometry and Translational Proteomics (NCI)
2007  Chair, NIH Study Section on Metabolomics (GM)
2008  Elected chair of Plant Molecular Biology Gordon Conference, 2012 (vice chair in 2010)
2009  Session chair, American Society of Mass Spectrometry Annual Meeting (Phil., PA)
2009  Member, two NIH Study Sections
2011  Class of 1933 Bascom Chaired Professorship
C. Selected Peer-reviewed Publications


D. Research Support

**Ongoing Research Support**

DE-FG02-88ER13938 Sussman (PI) 07/01/09-06/30/12

DOE

Molecular Mechanism of Energy Transduction by Plant Membrane Proteins

The overall goal of this project is to elucidate the role that protein kinase-mediated phosphorylation and single amino acid point mutations play in regulating plasma membrane proton pump activity in response to various physical and chemical conditions.

DBI-0701486 Sussman (PI) 09/01/07-08/31/12

NSF

GEPR: An Interdisciplinary Approach to Deciphering the Molecular Dialogue Between the Plasma Membrane and the Nucleus of *Medicago truncatula* (there are four co-PI’s)

2 P20 CA014520-34 Wilding (PI) 04/01/07-03/31/12

NIH/NCI

UWCCC Cancer Center Support Grant

Support for senior and program leaders of cancer center; administration and evaluation of research cancer center members; support of shared resources and services for peer-reviewed, cancer-related projects; developmental support for new investigators, projects and shared resources. I am in charge of the Human Proteomics core facility for the Cancer Center.

MCB-0929395 Sussman (PI) 11/01/09-10/31/13

NSF

Arabidopsis 2010: An Isotope-Assisted Quantitative Phosphoproteomics Approach to AtHK1-Mediated Osmosignaling in *Arabidopsis thaliana*

MCB-1144012 Sussman (PI) 9/1/2011-8/31/2013

NSF

Synthetic Biology Approach to Creating an Artificial Electrocyte", EAGER Award, MCB (Networks and Regulation Program)


Savannah River Nuclear Solutions Subcontract

Genomic Profiling Response of Arabidopsis to Lithium-The goal of this work is to determine the response of Arabidopsis transcriptome, proteome and metabolome, to lithium added to nutrient media.
BIOGRAPHICAL SKETCH

NAME
Douglas Weibel

POSITION TITLE
Assistant Professor of Biochemistry
Assistant Professor of Biomedical Engineering
dweibel

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

INSTITUTION AND LOCATION | DEGREE | MM/YY | FIELD OF STUDY
--- | --- | --- | ---
University of Utah, Salt Lake City, UT | B.S. | 1996 | Chemistry
Cornell University, Ithaca, NY | M.S. | 2000 | Chemistry
Cornell University, Ithaca, NY | Ph.D. | 2002 | Chemistry
Woods Hole, Marine Biological Laboratory | N/A | 2005 | Cell Biology
Harvard University, Cambridge, MA | (postdoc) | 2002–2006 | Chemistry, Biology

A. Personal Statement
The goal of the proposed research is to develop a simple, inexpensive, high-throughput methodology for characterizing the mechanical properties of live bacterial cells. Specifically, we propose the encapsulation of cells in biocompatible hydrogels, high-throughput measurements of growth rates using time-lapse optical methods, and biophysical modeling to extract the Young’s modulus of the cell wall of bacterial strains. This research will lay the foundation for characterizing the mechanical properties of a wide variety of bacterial strains, species, and mutants and will provide a framework for synthesizing a set of rules for how bacteria regulate their growth and mechanical properties. Downstream applications of this research include antibiotic development. The translation of this technique to the measurement of eukaryotic cells may provide direct insight into human diseases. I have the chemical, biological, and biophysical background to successfully develop this multidisciplinary research program. As a postdoctoral fellow at Harvard, I developed materials science-based approaches to study microbiological systems. I became an expert in the application of hydrogels and elastomeric polymers as materials for probing the behavior and physiology of microbes. As an assistant professor at UW-Madison, I have laid the groundwork for the proposed research by using polymers to manipulate bacterial growth and shape, which has provided insight into how proteins regulate cell morphology. Recently we have used hydrogels to study how membrane curvature influences the organization of biomolecules in bacterial cells. I have forged close, on-going collaborations with biologists and microbiologists at UW-Madison, Indiana University, Washington University, Yale, Princeton, and the Max Planck Institute for Terrestrial Microbiology, which have been instrumental in our development of expertise in bacterial genetics and biochemistry. I have also forged close collaboration with computational biologists and theorists at Stanford, UC Davis, and UW-Madison. Our lab currently consists of a multidisciplinary group of students and postdoctoral fellows with expertise that spans the physical sciences, life sciences, and engineering. I have successfully administrated research projects, collaborated with researchers from a broad cross-section of scientific fields on multidisciplinary research, and have published—and am in the process of writing and publishing—peer-reviewed manuscripts on all these research projects. These experiences have motivated me to formulate a budget, timeline, and research plan that is clear, concise, and realistic. This application combines our previous work on studying cell shape and the interface of bacteria and hydrogels with Dr. Huang, who provide expertise in modeling and computational analyses. In summary, my collaborative and multidisciplinary research background, a demonstrated record of productivity, and collaborations with experts in related areas will contribute to the success of the proposed research.

B. Positions and Honors
Positions and Employment

1994 – 1996 Research Assistant (C.D. Poulter), Department of Chemistry, University of Utah, SLC, UT
1996 – 1997 Fulbright Fellow (Y. Yamamoto), Department of Chemistry, Tohoku University, Sendai, Japan
1998 – 2002 Research Assistant (J. Meinwald), Department of Chemistry, Cornell University, Ithaca, NY
1999 Visiting Scientist (W. Boland), Max Planck Institute for Chemical Ecology, Jena, Germany
2001 **Visiting Scientist** (C. Gelfand), Orchid Biosciences LLC, Princeton, NJ
2002 – 2006 **Postdoctoral Fellow** (G.M. Whitesides), Department of Chemistry, Harvard University, MA
2006 – **Assistant Professor of Biochemistry**, University of Wisconsin-Madison, WI
2008 – **Assistant Professor of Biochemistry and Biomedical Engineering**, UW-Madison, WI

**Other Recent Experience and Professional Memberships**

2009 **Ad hoc grant reviewer**; NIH; NSF; Human Frontiers Science Program; American Chemical Society, Petroleum Research Foundation; Netherlands Organization for Scientific Research (NWO); Swiss National Science Foundation; USDA; NSF Graduate Research Fellowships

2010 **Participant**; NSF-MEXT Young Research Exchange Program in Nanotechnology, Japan/US. Visits to NIMS (Tsukuba), University of Tokyo, Kyoto University, and Osaka University.

2010 **Grant reviewer**; NSF

2010 **Organizer**; Mechanisms of Bacterial Cell Motility Symposium, American Society for Microbiology Meeting, San Diego

2006 – **Member**; American Chemical Society; American Society for Cell Biology; American Society for Microbiology; American Society for Biochemistry and Mol. Biology; Materials Research Society

2011 **Grant reviewer**; NSF; NSF CAREER Award; NIH; United States-Israel Binational Science Foundation

**Selected Honors**

1996 – 1997 Fulbright Fellow, Japan
1998 Dupont Teaching Award
1999 Russell Teaching Award
1999 – 2001 Pre-doctoral Fellowship
2003 – 2005 NRSA Postdoctoral Fellowship
2006 JSPS Fellow
2008 Non-tenured Faculty Award
2008 ICAAC Young Investigator Award
2008 Searle Scholar Award
2009 DARPA Young Investigator Award
2010 Alfred P. Sloan Research Fellow
2010 DuPont Young Professor Award
2010 JSPS Bridge Fellow
2011 Basil O’Connor Award
2011 New Innovator Award

**Selected peer-reviewed publications (from 50 peer-reviewed publications submitted and published)**

**Most relevant to the current application**


Additional relevant publications


D. Research Support
Ongoing Research Support
DMR-0520527; NSF de Pablo (PI) 07/01/07–08/30/12

Nanostructured Materials for Controlling Bacterial Physiology
Project goals are to develop nano- and microstructured polymers to control cell shape in bacteria.
Role: Co-Investigator

Alfred P. Sloan Foundation Research Fellow Weibel (PI) 07/01/10–06/30/14

Studying Bacterial Biochemistry and Engineering
This award supports research in bacterial biochemistry and engineering in the Weibel laboratory.

MSN137292: March of Dimes Birth Defects Foundation Weibel (PI) 02/01/11-01/31/13

Control of cellular differentiation and behavior in pathogenic strains of bacteria
The project goal is the synthesis new classes of polymers for studying bacterial swarming.

MSN139086; USDA, Hatch Weibel (PI) 10/01/11-09/30/15

Studying the mechanisms that bacteria use to sense surfaces and interfaces
The project goal is the study of molecular mechanisms that E. coli uses to sense physical interfaces.

1DP2OD008723-01; NIH Director’s New Innovator Award Weibel (PI) 09/30/11–07/31/16

Revisiting the bacterial cell wall as a target for new antibiotics
The project goals are to develop small molecule inhibitors of cell wall proteins as antibiotics.
Studying the structure and function of flagella in the emergent properties of bacterial communities
The project goal is to study the role of flagella on cell motility in viscous fluids and in triggering the morphological differentiation of vegetative cells into swarvers and their subsequent dedifferentiation.

Engineering new polymeric materials using bacteria
The project goal is to engineer new materials using bacteria and microorganisms.

Development of broad-spectrum antibiotics that inhibit bacterial cell division
The project goals are to develop Divin as a small molecule antibiotic that inhibits bacterial division.

The role of membrane curvature in protein localization in bacterial cells
The project goal tests the hypothesis that membrane curvature created lipids microdomains that recruit proteins to specific regions within bacterial cells.

Ongoing Science Education Support
MicroExplorers: Adventures in a Tiny Universe
The project goal is to develop science outreach materials for K-5 students in Madison.

MicroExplorers: Adventures in a Tiny Universe
The project goal is to develop science outreach materials for K-5 students in Madison.

Using Layers of Paper to Create Synthetic Microbial Communities: Bringing Science into Classrooms
The project goal is to use layers of paper to engineer communities of bacteria.

Pending Support
Curvature-mediated biomolecule localization in mitochondria
The project goal is to study the role membrane curvature on lipid and protein localization in mitochondria.

Geometric control of sub-cellular organization in bacterial cells
The project goal is to test the hypothesis that bacterial membrane curvature controls protein localization in bacteria.

Mechanical measurement technology for identifying bacterial stiffness modulators
The project goal is to develop a new method for measuring the stiffness of bacterial cell walls and to implement it to identify proteins that regulate cell wall assembly.

Form determines function: the role of shape in the physiology of neuronal mitochondria
The project goal is to study the hypothesis that intrinsic and extrinsic determinants of mitochondrial shape affect biomolecule localization.
NAME
Marvin Wickens

POSITION TITLE
Professor

eRA COMMONS USER NAME
MWICKENS

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>YEAR(s)</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of California, Berkeley, CA</td>
<td>B.A.</td>
<td>1972</td>
<td>Biochem &amp; Chemistry (honors)</td>
</tr>
<tr>
<td>Stanford University, Stanford, CA (Research Advisor: Robert T. Schimke)</td>
<td>Ph.D.</td>
<td>1978</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td>MRC Laboratory of Molecular Biology, Cambridge, England (Mentor: John Gurdon)</td>
<td>Post-doc</td>
<td>1979-1982</td>
<td>Molecular Biology</td>
</tr>
</tbody>
</table>

Please refer to the application instructions in order to complete sections A, B, and C of the Biographical Sketch.

A. Appointments
1983- Assistant, Associate and Full Professor, Biochemistry Department, University of Wisconsin-Madison

B. Fellowships, honors, and awards

Honors and Awards
2011 Elected, American Academy of Arts and Sciences
2007 RNA Society Lifetime Service Award
2003 – Max Perutz Professor of Molecular Biology and Biochemistry
2002 President, The RNA Society
1997 Mid-Career Development Award
1993 – 1998 Co-founder and Member of the Board of Directors, The RNA Society
1992 Romnes Faculty Fellowship
1983 Steenbock Career Development Award
1979 Helen Hay Whitney Foundation, Post-doctoral Fellow

Editorial Boards
2011-2014 EMBO Reports Advisory Editorial Board
2011- Editor, RNA
2004- Editor, PLoS Biology (Public Library of Science)
2002 – Associate Editor, Critical Reviews of Biochemistry and Molecular Biology
2002- Associate Editor, PLoS
2001 – Section Leader, Faculty of 1000
1994 – 2011 Associate Editor, RNA
1994 – Associate Editor, Molecular Biology of the Cell

National Service
2007 Liaison, Assessment of NIH Peer Review
1997- 2003 Member, NIH Center for Scientific Review Advisory Committee
1997 – 2000 Member, NIH Cell Development and Function IRG Working Group
1995 – 1998 Chairman, NIH Molecular Biology Study Section (CDF-1)
1993 – 1995 Member, NIH Molecular Biology Study Section
1988 NIH Research Career Development Award
1989 – 1993 Annual ad hoc member of NIH Molecular Biology Study Section
a single mRNA. *J. Biol. Chem.*, 282, 15430-15438.


Reviews and Essays


Patents

D. RESEARCH SUPPORT

Ongoing

5R01GM50942 (Marvin Wickens PI)
NIH
Function of 3'UTRs
Dates: (04/01/1994 – 11/30/12)
The major goals of this project are to understand how 3'UTR-binding repressor proteins regulate mRNAs.
Role: PI

5R01GM50942 13S1 (Marvin Wickens PI)
NIH – ARRA Supplement
Function of 3'UTRs
Dates: (04/01/2009 – 11/30/12)
The major goals of this project are to understand how 3'UTR-binding repressor proteins regulate mRNAs.
Role: PI

5R37GM31982 (Marvin Wickens PI)
NIH
Cleavage, polyadenylation and transport of mRNA
(04/01/1983-11/30/12)
The major goals of this project are to isolate and characterize GLD2 proteins and elucidate how they are controlled.
Role: PI
The overall goal of my research program is to characterize the mechanisms that regulate neuronal polarization in developing organisms. My current research uniquely combines in vitro analyses of the dynein motor (how it binds microtubules and moves along them) with two in vivo approaches: (1) the characterization of cofactors that provide functional specificity and (2) the development of a novel system to directly test how changes in the microtubule cytoskeleton affect microtubule-based transport and neuronal polarization. As a graduate student I combined Drosophila genetics, molecular biology, and biochemistry to investigate the transcriptional regulation of neuron specification and programmed cell death. With an interest in the mechanisms that create cell polarity after a neuron is specified, I joined the lab of Dr. Yuh Nung Jan. In my post-doctoral research I learned about neuronal polarity as well as other types of cellular polarity and developed additional skills: techniques to image neurons in intact, live embryos and larvae; experience in conducting a large-scale forward genetic screen; in vitro analyses of dynein motor behavior and a new knock-in strategy called genomic engineering. These techniques enable me to comprehensively investigate the interactions between motors and microtubules during polarization. The culmination of my experiences has taught me how to take advantage of Drosophila genetics to address questions in vivo and how to incorporate other approaches to fully delineate the molecular mechanisms underlying developmental processes. Now, at the start of my career as an independent investigator, I look forward with enthusiasm to successfully carrying out my research plans to establish an independent, stable research program.
1997-2005: Graduate student, Columbia University, New York, NY
Thesis advisor: Dr. Richard Mann
Project title: The role of transcription factors in Drosophila neurodevelopment

2005-2011: Post-doctoral fellow, University of California, San Francisco, CA
Advisor: Dr. Yuh Nung Jan
Project title: Mechanisms that promote neuronal polarization in vivo.

Honors

1993       James J. Kerrigan Memorial Undergraduate Scholarship Award
1995       Howard Hughes Medical Institute Summer Fellow, Swarthmore College
1996       Coleman H. Wheeler Summer Fellow, RS Dow Neurological Sciences Inst
2007       Ruth L. Kirschstein National Research Service Award (NRSA)
2010       NIH Pathway to Independence (PI) Award (K99/R00)

C. Peer-reviewed Publications


(*these authors contributed equally to this work)


(*these authors contributed equally to this work)
D. Research Support

Active

• 09/01/2010-current
NIH Pathway to Independence (PI) Award (K99/R00) (grant # 5K99NS072252)
Role: PD/PI
Title: Role of microtubule-based transport in neuronal polarity
Description: This proposal combines in vivo and in vitro approaches to characterize how the molecular motor dynein and the microtubule cytoskeleton construct neuronal polarity.

Completed

• 01/07/2007-06/30/2010
NIH Ruth L. Kirschstein National Research Service Award (grant # 5F32HD053199)
Role: PD/PI
Title: How neuronal polarity is established in vivo.
Description: The goal of this proposal was to identify genes that regulate neuronal morphology and polarity. Through a forward genetic screen in the developing fruit fly, we uncovered mutations that regulate the intrinsic polarity of a neuron (mutations in two components of the dynein motor complex) as well as a mutation that affects how a neuron’s polarity is oriented relative to the surrounding tissue (female sterile homeotic, a conserved transcriptional regulator). The results of our work on dynein were published in Nature Cell Biology.
Appendix 4

Biochemistry Faculty with Joint Appointments

Appointments with other campus departments:
- Clagett-Dame – Pharmaceutical Sciences (25% appointment)
- Kiessling – Chemistry (50% appointment)
- Kimble – Cell and Regenerative Medicine (0% appointment)
- Kimble – Medical Genetics (0% appointment)
- Mitchell – Math (50% appointment)
- Ntambi – Nutritional Sciences (50% appointment & Chair)
- Raines – Chemistry (0% appointment)
- Ralph – Biological Systems Engineering (0% appointment)
- Record – Chemistry (50% appointment)
- Weibel – Biomedical Engineering (affiliate)

Appointments with Graduate School Centers/Institutes
- Ansari – The Genome Center (25% appointment)
- Friesen – Institute for Molecular Virology (50% appointment)
- Kimble – Laboratory of Molecular Biology (0% appointment)
- Palmenberg – Institute for Molecular Virology (25% appointment)
- Sussman – Director, Biotechnology Center (50% appointment)
# Appendix 5

## Faculty Additions/Subtractions

<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Margaret Clagett-Dame</td>
<td>1996</td>
<td>Campus Transfer</td>
</tr>
<tr>
<td>Joel Rothman</td>
<td>1996</td>
<td>Moved to UC-Santa Barbara</td>
</tr>
<tr>
<td>Roland Rueckert</td>
<td>1996</td>
<td>Retired</td>
</tr>
<tr>
<td>Julius Adler</td>
<td>1996</td>
<td>Retired</td>
</tr>
<tr>
<td>Laura Kiessling</td>
<td>1997</td>
<td>Campus Transfer (50%)</td>
</tr>
<tr>
<td>Ann Palmenberg</td>
<td>1997</td>
<td>Campus Transfer</td>
</tr>
<tr>
<td>Jack Gorski</td>
<td>1997</td>
<td>Retired</td>
</tr>
<tr>
<td>George Phillips</td>
<td>2000</td>
<td>Cluster Hire</td>
</tr>
<tr>
<td>Samuel Butcher</td>
<td>2000</td>
<td>Cluster Hire</td>
</tr>
<tr>
<td>Max Nibert</td>
<td>2000</td>
<td>Moved to Harvard Medical School</td>
</tr>
<tr>
<td>J. Wesley Pike</td>
<td>2001</td>
<td>Cluster Hire</td>
</tr>
<tr>
<td>Heinrich Schnoes</td>
<td>2001</td>
<td>Retired</td>
</tr>
<tr>
<td>John Suttie</td>
<td>2001</td>
<td>Retired</td>
</tr>
<tr>
<td>Alan Attie</td>
<td>2002</td>
<td>Campus Transfer/Open Biochem Position</td>
</tr>
<tr>
<td>Michael Sussman</td>
<td>2002</td>
<td>Campus Transfer</td>
</tr>
<tr>
<td>Elizabeth Craig</td>
<td>2002</td>
<td>Campus Transfer</td>
</tr>
<tr>
<td>Aseem Ansari</td>
<td>2002</td>
<td>Cluster Hire</td>
</tr>
<tr>
<td>Paul Ludden</td>
<td>2002</td>
<td>Moved to UC-Berkeley</td>
</tr>
<tr>
<td>Julie Mitchell</td>
<td>2003</td>
<td>Cluster Hire</td>
</tr>
<tr>
<td>Anant Menon</td>
<td>2005</td>
<td>Moved to Cornell</td>
</tr>
<tr>
<td>Douglas Weibel</td>
<td>2006</td>
<td>Cluster Hire</td>
</tr>
<tr>
<td>Peter Belshaw *</td>
<td>2006</td>
<td>Denied Tenure</td>
</tr>
<tr>
<td>Robert Landick</td>
<td>2007</td>
<td>Campus Transfer</td>
</tr>
<tr>
<td>Bill Reznikoff</td>
<td>2007</td>
<td>Retired</td>
</tr>
<tr>
<td>Rebecca Montgomery §</td>
<td>2007</td>
<td>Denied Tenure</td>
</tr>
<tr>
<td>John Ralph</td>
<td>2008</td>
<td>Campus Transfer</td>
</tr>
<tr>
<td>Alessandro Senes</td>
<td>2008</td>
<td>Open Biochem Position</td>
</tr>
<tr>
<td>Perry Frey</td>
<td>2008</td>
<td>Retired</td>
</tr>
<tr>
<td>Ross Inman</td>
<td>2008</td>
<td>Retired</td>
</tr>
<tr>
<td>David Pagliarini</td>
<td>2009</td>
<td>Open Biochem Position</td>
</tr>
<tr>
<td>Christiane Wiese %</td>
<td>2010</td>
<td>Denied Tenure</td>
</tr>
<tr>
<td>Aaron Hoskins</td>
<td>2011</td>
<td>Open Biochem Position</td>
</tr>
<tr>
<td>Hector Deluca</td>
<td>2011</td>
<td>Retired</td>
</tr>
<tr>
<td>Jill Wildonger</td>
<td>2012</td>
<td>Open Biochem Position</td>
</tr>
</tbody>
</table>

* 1999 Cluster Hire

§ 1998 Hired Open Biochem Position

% 2001 Hired Open Biochem Position

# Moving to Rice (Retiring from UW 8/2012)
## Appendix 6

### Research Grants

<table>
<thead>
<tr>
<th>PI Names</th>
<th>Most Recent Direct Costs</th>
<th>Start Date</th>
<th>End Date</th>
<th>Description</th>
<th>Sponsor</th>
<th>Federal</th>
<th>Sponsored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amasino, Richard M</td>
<td>$43,041.00</td>
<td>08/01/2006</td>
<td>07/31/2012</td>
<td>TRMS-Genetic Analysis of Natural Variation</td>
<td>NIH (Dartmouth College)</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Amasino, Richard M</td>
<td>$153,821.00</td>
<td>03/01/2011</td>
<td>02/28/2016</td>
<td>Genetic Analysis of Natural Variation</td>
<td>NIH (Dartmouth College)</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$196,862.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ansari, Aseem Z</td>
<td>$40,000.00</td>
<td>07/01/2006</td>
<td>06/30/2014</td>
<td>Shaw Scientist Award</td>
<td>Greater Milwaukee Foundation</td>
<td>Non-federal</td>
<td>Non-Sponsored</td>
</tr>
<tr>
<td>Ansari, Aseem Z</td>
<td>$97,796.00</td>
<td>05/01/2008</td>
<td>04/30/2013</td>
<td>CAREER: Exploring the role of Kin28/Cdk7</td>
<td>NSF</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Ansari, Aseem Z</td>
<td>$201,275.00</td>
<td>07/01/2008</td>
<td>05/31/2013</td>
<td>Targeting Leukemia-Causing Oncogene</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$339,071.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attie, Alan D</td>
<td>$272,728.00</td>
<td>12/01/2010</td>
<td>11/30/2012</td>
<td>Identification of Novel Pancreatic Beta-Cell</td>
<td>Juvenile Diabetes Research Foundation</td>
<td>Non-federal</td>
<td>Non-Sponsored</td>
</tr>
<tr>
<td>Attie, Alan D</td>
<td>$185,000.00</td>
<td>06/01/2006</td>
<td>05/31/2012</td>
<td>The Genetics of Obesity and Diabetes</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Attie, Alan D</td>
<td>$45,174.00</td>
<td>04/15/2010</td>
<td>03/31/2013</td>
<td>A Genomic Metabolomic Strategy</td>
<td>NIH (Burnham Institute)</td>
<td>Non-federal</td>
<td>Non-Sponsored</td>
</tr>
<tr>
<td>Attie, Alan D</td>
<td>$75,000.00</td>
<td>04/15/2011</td>
<td>03/31/2012</td>
<td>The Collaborative Cross Project</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Attie, Alan D</td>
<td>$408,374.00</td>
<td>02/19/2010</td>
<td>11/30/2014</td>
<td>Genes and Gene Networks</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$986,276.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bednarek, Sebastian Y</td>
<td>$175,342.00</td>
<td>12/01/2011</td>
<td>11/30/2014</td>
<td>Molecular Analysis of Proteins</td>
<td>NSF</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Bednarek, Sebastian Y</td>
<td>$46,041.00</td>
<td>10/01/2011</td>
<td>04/30/2012</td>
<td>Functional Analysis of the Plant Dynamin</td>
<td>Hatch Act Formula Fund</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$227,069.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butcher, Samuel E</td>
<td>$192,150.00</td>
<td>04/01/2010</td>
<td>03/31/2014</td>
<td>HIV Frameshift Site RNA: Structure</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Butcher, Samuel E</td>
<td>$94,050.00</td>
<td>09/28/2007</td>
<td>08/31/2012</td>
<td>Structure and Function of U6 Spliceosomal</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$593,305.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleland, W Wallace</td>
<td>$336,458.00</td>
<td>05/01/2009</td>
<td>04/30/2013</td>
<td>The Structure and Function of Pyruvate</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Cleland, W Wallace</td>
<td>$150,000.00</td>
<td>04/01/2012</td>
<td>03/31/2014</td>
<td>Kinetic Studies of Enzyme Mechanisms</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$486,458.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cox, Michael M</td>
<td>$255,416.33</td>
<td>01/01/2011</td>
<td>12/31/2013</td>
<td>Tools for Improving the Quiality of DNA</td>
<td>Department of Justice</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Cox, Michael M</td>
<td>$366,052.00</td>
<td>08/01/2011</td>
<td>04/30/2015</td>
<td>The Biochemistry of Genetic Recombination</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$621,468.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Craig, Elizabeth A</td>
<td>$234,778.00</td>
<td>05/01/2009</td>
<td>03/31/2013</td>
<td>Roles of Molecular Chaperones</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Craig, Elizabeth A</td>
<td>$309,597.00</td>
<td>07/01/2009</td>
<td>06/30/2013</td>
<td>Functional diversity of J-protein</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$544,375.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dame, Margaret C</td>
<td>$161,240.00</td>
<td>05/01/2003</td>
<td>04/30/2012</td>
<td>Vitamin A Analog Studies</td>
<td>Deltanoid Pharmaceuticals</td>
<td>Non-federal</td>
<td>Non-Sponsored</td>
</tr>
<tr>
<td>Dame, Margaret C</td>
<td>$66,104.00</td>
<td>03/01/2010</td>
<td>02/28/2012</td>
<td>Analog studies of 4-HPR and its glucuronide</td>
<td>NIH (Ohio State University)</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$227,344.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fox, Brian G</td>
<td>$145,527.00</td>
<td>07/29/2011</td>
<td>07/29/2012</td>
<td>Improving Biomass Conversion in the Rumen</td>
<td>Elanco</td>
<td>Non-federal</td>
<td>Non-Sponsored</td>
</tr>
<tr>
<td>Fox, Brian G</td>
<td>$150,000.00</td>
<td>06/01/2009</td>
<td>05/31/2013</td>
<td>AARA Protein-Protein Interaction Surfaces</td>
<td>NSF</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Fox, Brian G</td>
<td>$2,020,904.00</td>
<td>07/01/2011</td>
<td>06/30/2012</td>
<td>Center for Membrane Protein Structure</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$2,316,431.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Proposal Amount</td>
<td>Start Date</td>
<td>End Date</td>
<td>Funding Description</td>
<td>Sponsor</td>
<td>Sponsorship Type</td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------</td>
<td>------------</td>
<td>------------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>Hayes, Colleen E</td>
<td>$155,306.00</td>
<td>10/01/2009</td>
<td>09/30/2012</td>
<td>Calcitriol Synthesis and IL-10</td>
<td>National Multiple Sclerosis Society</td>
<td>Non-federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Hayes, Colleen E</td>
<td>$197,019.00</td>
<td>10/01/2010</td>
<td>09/30/2013</td>
<td>Vitamin D and Estrogen Synergy</td>
<td>National Multiple Sclerosis Society</td>
<td>Non-federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Hayes, Colleen E</td>
<td>$38,558.00</td>
<td>10/01/2011</td>
<td>09/30/2012</td>
<td>Vitamin D Nutrition and Optimal Immunological</td>
<td>Hatch Act Formula Fund</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$390,883.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holden, Hazel M</td>
<td>$12,000.00</td>
<td>04/01/2009</td>
<td>03/31/2012</td>
<td>Enzymes Required for the Biosynthesis</td>
<td>NSF</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Holden, Hazel M</td>
<td>$16,835.00</td>
<td>05/01/2009</td>
<td>02/29/2012</td>
<td>Enzymology of N5-CAIR Synthetase</td>
<td>NIH (Wayne State University)</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Holden, Hazel M</td>
<td>$217,500.00</td>
<td>02/01/2011</td>
<td>01/31/2016</td>
<td>X-ray Studies of Sugar-Modifying Enzymes</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$246,335.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoskins, Aaron A</td>
<td>$214,585.59</td>
<td>09/01/2011</td>
<td>07/31/2014</td>
<td>Mechanisms of Spliceosome Assembly</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Hoskins, Aaron A</td>
<td>$28,597.00</td>
<td>01/01/2012</td>
<td>09/30/2012</td>
<td>Mechanisms and Applications of Splicing</td>
<td>Hatch Act Formula Fund</td>
<td>Non-federal Sponsored</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$243,182.59</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kiessling, Laura L</td>
<td>$219,371.00</td>
<td>01/01/2008</td>
<td>11/30/2011</td>
<td>Glycopeptides and Non-Natural</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Kiessling, Laura L</td>
<td>$245,025.00</td>
<td>12/02/2008</td>
<td>11/30/2013</td>
<td>Synthetic Ligands for Modulation</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$464,396.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kimble, Judith</td>
<td>$171,518.00</td>
<td>03/01/2009</td>
<td>12/31/2012</td>
<td>Regulation of Germline Proliferation</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Kimble, Judith</td>
<td>$53,942.00</td>
<td>01/01/2011</td>
<td>12/31/2011</td>
<td>Chemical Control of Protein</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$225,460.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landick, Robert C</td>
<td>$388,085.00</td>
<td>07/05/2011</td>
<td>06/30/2015</td>
<td>Structure/Function of Transcription Complex</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$388,085.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Markley, John L</td>
<td>$37,925.00</td>
<td>09/20/2010</td>
<td>08/31/2013</td>
<td>Structure-Stabilized GPCRs for Functional</td>
<td>Lucigen</td>
<td>Non-federal Non-Sponsored</td>
<td></td>
</tr>
<tr>
<td>Markley, John L</td>
<td>$128,372.00</td>
<td>09/01/2011</td>
<td>02/28/2013</td>
<td>National Biomedical NMR Resource</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Markley, John L</td>
<td>$675,707.00</td>
<td>03/01/2011</td>
<td>02/29/2012</td>
<td>National Biomedical NMR Resource</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Markley, John L</td>
<td>$1,015,290.00</td>
<td>07/01/2011</td>
<td>06/30/2012</td>
<td>Partnership for High-throughput Enabled Biology</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Markley, John L</td>
<td>$489,649.00</td>
<td>09/15/2011</td>
<td>09/14/2012</td>
<td>Biological Magnetic Resonance Data Bank</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>**$2,346,943.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Martin, Thomas F J</td>
<td>$322,659.00</td>
<td>04/01/2009</td>
<td>03/31/2014</td>
<td>Stages of Regulated Exocytosis</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Martin, Thomas F J</td>
<td>$222,500.00</td>
<td>04/01/2011</td>
<td>03/31/2016</td>
<td>Calcium Regulation of Secretion</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$545,159.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ntambi, James Mukasa</td>
<td>$16,609.00</td>
<td>05/01/2010</td>
<td>04/30/2015</td>
<td>Metabolic Regulators in the Mechanisms</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Ntambi, James Mukasa</td>
<td>$39,733.00</td>
<td>10/01/2012</td>
<td>09/31/2016</td>
<td>The Role of Hepatic Stearoyl-CoA Desaturase-1</td>
<td>Hatch</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$56,342.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pagliarini, David J</td>
<td>$100,000.00</td>
<td>07/01/2011</td>
<td>06/30/2014</td>
<td>Integrative Analysis of an Ancient Mitochondrial</td>
<td>Searle Scholars Program</td>
<td>Non-federal Non-Sponsored</td>
<td></td>
</tr>
<tr>
<td>Pagliarini, David J</td>
<td>$60,000.00</td>
<td>08/01/2011</td>
<td>07/31/2013</td>
<td>Glenn Award for Research in Biological</td>
<td>Glenn Foundation for Medical Research</td>
<td>Non-federal Non-Sponsored</td>
<td></td>
</tr>
<tr>
<td>Pagliarini, David J</td>
<td>$40,000.00</td>
<td>07/01/2012</td>
<td>06/30/2017</td>
<td>Shaw Scientist Program</td>
<td>Greater Milwaukee Foundation</td>
<td>Non-federal Non-Sponsored</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$200,000.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phillips Jr, George N</td>
<td>$542,481.00</td>
<td>09/30/2011</td>
<td>08/31/2012</td>
<td>Enzyme Discovery for Natural Product</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Phillips Jr, George N</td>
<td>$65,900.00</td>
<td>08/01/2011</td>
<td>07/31/2012</td>
<td>Structure-Stabilized GPCRs for Functional</td>
<td>Lucigen</td>
<td>Non-federal Sponsored</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$611,781.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI Names</td>
<td>Most Recent Direct Costs</td>
<td>Start Date</td>
<td>End Date</td>
<td>Description</td>
<td>Sponsor</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------</td>
<td>------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>Pike, John W</td>
<td>$196,902.00</td>
<td>01/15/2007</td>
<td>11/30/2012</td>
<td>Molecular Mechanisms of RANKL</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Pike, John W</td>
<td>$208,271.00</td>
<td>04/01/2008</td>
<td>03/31/2013</td>
<td>Vitamin D Ligands and Regulation</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Pike, John W</td>
<td>$262,105.00</td>
<td>07/01/2009</td>
<td>05/31/2013</td>
<td>Dynamic Mechanisms of Vitamin</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Pike, John W</td>
<td>$274,962.00</td>
<td>09/16/2011</td>
<td>07/31/2016</td>
<td>Bone Cell Regulation of the Vitamin D Receptor</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Raines, Ronald T</td>
<td>$209,088.00</td>
<td>05/01/2008</td>
<td>03/31/2013</td>
<td>Chemistry and Biology of Collagen</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Raines, Ronald T</td>
<td>$213,149.00</td>
<td>01/01/2009</td>
<td>11/30/2013</td>
<td>Ribonucleases in Cancer Chemot</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Raines, Ronald T</td>
<td>$215,622.00</td>
<td>05/01/2009</td>
<td>04/30/2013</td>
<td>Protein Chemistry</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Raines, Ronald T</td>
<td>$80,808.00</td>
<td>10/01/2011</td>
<td>09/30/2014</td>
<td>International Collaboration in Chemistry</td>
<td>NSF</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Ralph, John</td>
<td>$47,565.00</td>
<td>09/15/2009</td>
<td>08/31/2013</td>
<td>Regulation and Predictive Modeling of Lignin</td>
<td>NSF (North Carolina State University)</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Ralph, John</td>
<td>$474,664.00</td>
<td>09/01/2011</td>
<td>08/31/2014</td>
<td>Development of Crucial Tools</td>
<td>DOE, Chicago Operations Office</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Ralph, John</td>
<td>$83,100.00</td>
<td>09/01/2011</td>
<td>08/31/2014</td>
<td>Biodegradative Oxidant</td>
<td>DOE, Chicago Operations Office</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Rayment, Ivan</td>
<td>$220,523.00</td>
<td>12/01/2008</td>
<td>11/30/2012</td>
<td>Structure Function Studies of the Spindle-Pole</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Rayment, Ivan</td>
<td>$20,400.00</td>
<td>05/26/2011</td>
<td>05/25/2012</td>
<td>Structural and Functional Studies</td>
<td>USDA, Agricultural Research Service</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Record Jr, M Thomas</td>
<td>$203,123.00</td>
<td>12/15/2009</td>
<td>11/30/2013</td>
<td>Developing Solutes as Structure</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Weibel, Douglas B</td>
<td>$68,182.00</td>
<td>02/01/2011</td>
<td>01/31/2013</td>
<td>Control of Celluar Differentiation</td>
<td>March of Dimes Birth Defects Foundation</td>
<td>Non-federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Weibel, Douglas B</td>
<td>$36,943.55</td>
<td>10/01/2011</td>
<td>09/30/2012</td>
<td>Studying the Mechanisms</td>
<td>Hatch Act Formula Fund</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Weibel, Douglas B</td>
<td>$114,333.33</td>
<td>08/15/2011</td>
<td>07/31/2014</td>
<td>Studying the structure and function</td>
<td>NSF</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Weibel, Douglas B</td>
<td>$300,000.00</td>
<td>09/30/2011</td>
<td>08/31/2016</td>
<td>Revisiting the bactericall cell wall</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Wickens, Marvin P</td>
<td>$235,224.00</td>
<td>12/17/2007</td>
<td>11/30/2012</td>
<td>Cleavage, Polyadenylation, and</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Wickens, Marvin P</td>
<td>$235,224.00</td>
<td>01/12/2009</td>
<td>11/30/2012</td>
<td>Function of 3' UTRs</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Wildonger, Jill</td>
<td>$212,425.00</td>
<td>04/01/2012</td>
<td>03/31/2015</td>
<td>Role of Microtuble-Based Transport in Neuronal</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Training Grants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI Names</td>
<td>Most Recent Direct Costs</td>
<td>Start Date</td>
<td>End Date</td>
<td>Description</td>
<td>Sponsor</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Fox, Brian G</td>
<td>$625,977.00</td>
<td>07/01/2011</td>
<td>06/30/2012</td>
<td>Biotechnology Training Program</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
<tr>
<td>Kiessling, Laura L</td>
<td>$499,864.00</td>
<td>07/01/2011</td>
<td>06/30/2012</td>
<td>Chemical Biology Interface Training Grant</td>
<td>NIH</td>
<td>Federal Sponsored</td>
<td></td>
</tr>
</tbody>
</table>
**Educational Grants**

<table>
<thead>
<tr>
<th>PI Names</th>
<th>Most Recent Direct Costs</th>
<th>Start Date</th>
<th>End Date</th>
<th>Description</th>
<th>Sponsor</th>
<th>Federal</th>
<th>Sponsored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amasino,Richard M</td>
<td>$247,269.92</td>
<td>09/01/2006</td>
<td>08/31/2012</td>
<td>Howard Hughes Medical Institute Professors</td>
<td>Hughes (Howard) Medical Institute</td>
<td>Non-federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Amasino,Richard M</td>
<td>$721,555.00</td>
<td>01/15/2011</td>
<td>01/14/2013</td>
<td>Place Based Opportunities for Sustainable</td>
<td>USDA,Natl Institute Food &amp; Agriculture</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Weibel,Douglas B</td>
<td>$25,000.00</td>
<td>07/01/2010</td>
<td>06/30/2014</td>
<td>Special Grant Program in the Chemical Science</td>
<td>Dreyfus (Camille&amp;Henry) Foundation, IN</td>
<td>Non-federal</td>
<td>Non-Sponsored</td>
</tr>
</tbody>
</table>

**Notes:**

- **Michael Sussman** is a Professor of Biochemistry and Biotechnology. Dr. Sussman is also the Director of UW Biotechnology Center. He has the following active grants:

<table>
<thead>
<tr>
<th>PI Names</th>
<th>Most Recent Direct Costs</th>
<th>Start Date</th>
<th>End Date</th>
<th>Description</th>
<th>Sponsor</th>
<th>Federal</th>
<th>Sponsored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sussman,Michael R</td>
<td>$90,120.00</td>
<td>07/01/2000</td>
<td>06/30/2015</td>
<td>Molecular Mechanism of Energy Transduction</td>
<td>Department of Energy</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Sussman,Michael R</td>
<td>$361,248.00</td>
<td>09/01/2007</td>
<td>08/31/2012</td>
<td>GEPR: An Interdisciplinary App</td>
<td>NSF</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Sussman,Michael R</td>
<td>$275,758.00</td>
<td>12/15/2009</td>
<td>11/30/2012</td>
<td>Arabidopsis 2010: An Isotope-Assisted Quan</td>
<td>NSF</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Sussman,Michael R</td>
<td>$14,000.00</td>
<td>09/01/2007</td>
<td>08/31/2012</td>
<td>GEPR: An Interdisciplinary App</td>
<td>NSF</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Sussman,Michael R</td>
<td>$81,132.00</td>
<td>04/01/2011</td>
<td>03/31/2012</td>
<td>UW Comprehensive Cancer Center Support</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Sussman,Michael R</td>
<td>$101,010.00</td>
<td>09/01/2011</td>
<td>08/31/2013</td>
<td>EAGER - Electrocyte</td>
<td>NSF</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$923,268.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Ann Palmenberg** is a Professor of Biochemistry and at the Institute for Molecular Virology. Dr. Palmenberg currently has the following active grants:

<table>
<thead>
<tr>
<th>PI Names</th>
<th>Most Recent Direct Costs</th>
<th>Start Date</th>
<th>End Date</th>
<th>Description</th>
<th>Sponsor</th>
<th>Federal</th>
<th>Sponsored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palmenberg,Ann C</td>
<td>$220,523.00</td>
<td>12/15/2008</td>
<td>11/30/2013</td>
<td>Cardioviral Proteases and Comparative Genome Structure</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Palmenberg,Ann C</td>
<td>$249,405.00</td>
<td>09/01/2010</td>
<td>08/31/2012</td>
<td>ARRA The Role of Viruses in Human Cancer</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Palmenberg,Ann C</td>
<td>$73,120.00</td>
<td>09/01/2010</td>
<td>08/31/2012</td>
<td>Mechanisms of Rhinovirus-Induced Exacerbations of Asthma</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$543,048.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Paul Friesen** is a Professor of Biochemistry and at the Institute for Molecular Virology. Dr. Friesen currently has the following active grant:

<table>
<thead>
<tr>
<th>PI Names</th>
<th>Most Recent Direct Costs</th>
<th>Start Date</th>
<th>End Date</th>
<th>Description</th>
<th>Sponsor</th>
<th>Federal</th>
<th>Sponsored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friesen,Paul D</td>
<td>$100,000.00</td>
<td>09/08/2010</td>
<td>08/31/2012</td>
<td>Regulation of Virus-Induced Programmed Cell</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td></td>
<td>$100,000.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Greater Lakes Bioenergy Research Center:** The following Principle Investigators in the Department of Biochemistry also receive funding from Greater Lakes Bioenergy Research Center as part of their collaborative efforts:

  *Richard Amasino received $265,298 in direct costs for the current year.
  *Brian G. Fox received $279,728 in direct costs for the current year.
  *Robert Landick received $1,043,465 in direct costs for the current year.
  *Ronald T. Raines received $109,666 in direct costs for the current year.
  *John Ralph received $512,712 in direct costs for the current year.
Footnotes:
1Laura Kiessling is a Professor and MacArthur Foundation Fellow in the Biochemistry Department as well as the Department of Biochemistry. Dr. Kiessling currently has the following active grant through the Department of Chemistry:

<table>
<thead>
<tr>
<th>PI Names</th>
<th>Most Recent Direct Costs</th>
<th>Start Date</th>
<th>End Date</th>
<th>Description</th>
<th>Sponsor</th>
<th>Federal</th>
<th>Sponsored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiessling, Laura L</td>
<td>$247,500.00</td>
<td>01/01/2010</td>
<td>12/31/2014</td>
<td>The Chemistry and Biology of Galactofuranose Residues</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td>Kiessling, Laura L</td>
<td>$261,786.00</td>
<td>09/30/2011</td>
<td>07/31/2015</td>
<td>Multivalent Ligands As Effectors</td>
<td>NIH</td>
<td>Federal</td>
<td>Sponsored</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$585,150.00</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2Judith Kimble is a Howard Hughes Medical Institute Investigator.

3David Pagliarini is key personnel on Dr. John L. Markley's NIH proposal, "Partnership for High-throughput Enabled Biology of the Mitochondrial Proteome". The last year's direct costs allocation was $1,015,290.

Julie Mitchell is an Associate Professor of Biochemistry and Mathematics. She is currently the lead PI on a grant from the Department of Energy that is managed by the Mathematics Department, but has had a most recent direct costs budget add of $987,551.00.
Overview of Signature Activities in 2011 – Department of Biochemistry

Activities have been broken down into 5 categories. For the first four, one example of an achievement is listed for: 1. Research grant support of probationary faculty, 2. Research grant support of tenured faculty, 3. Undergraduate teaching program and 4. Outreach activities. The consensus from a faculty discussion was that the strength of the department lies in the accomplishments of the faculty as a whole and thus achievement 5 is an overall department summary of research activities.

1. Research grant support of probationary faculty:
Doug Weibel received an NIH Director’s New Innovator Award. Only 48 of these 2.5 million dollar awards are given out annually nationwide. The award is “designed specifically to support unusually creative new investigators with highly innovative research ideas at an early stage of their career”. Doug’s proposal entitled “REVISITING THE BACTERIAL CELL WALL AS A TARGET FOR NEW ANTIBIOTICS” aims to develop a high-throughput, materials science-based technique for measuring the mechanical properties of bacterial cell walls. He is using genome-wide approaches to identify potential targets and plans to develop small molecules that target proteins identified. The long-term goal is to stimulate the development of potent classes of antibiotics that have applications in preventing and treating infections.

2. Research grant support of tenured faculty:
John Markley, as principal investigator (and Dave Pagliarini/Brian Fox as co-PIs) received a grant entitled “The Partnership for High-Throughput Enabled Biology of the Mitochondrial Proteome” as part of the MFA from NIH for Consortia for High-Throughput-Enabled Structural Biology Partnerships. This grant, 8.3 million dollars over five years, has the goal of applying technologies developed by the Protein Structure Initiative (PSI) to problems of interest to the community of biologists and biochemists who investigate the role of mitochondria in human health and disease. The Mitochondrial Protein Partnership is collaborating with members of the scientific community working on mitochondrial proteins of biological/biomedical interest throughout the country, as well as here at UW-Madison.

3. Undergraduate teaching program:
Several initiatives have either come to fruition or been solidified over the past year to provide our undergraduates learning experiences beyond formal classroom settings. [1] three international programs established and run by department faculty to allow students to study/learn abroad: SCORE (Wickens at Oxford and Cambridge, England; Uganda Program (Ntambi); Khorana Program (Ansari, various institutions in India) [2] funding was either garnered or realigned to allow Biochemistry to fund 7 undergraduate summer research fellowships per year, on an ongoing basis. [3] a Biochemistry Scholars Program was established. This program facilitates the entry of Biochemistry majors into research laboratories by the beginning of their sophomore year and is designed to provide significant research experience hoping culminating in meeting presentation and publication of their work.

4. Outreach activities
Rick Amasino is the principal investigator on a grant entitled “Place-Based Opportunities For Sustainable Outcomes And High-Hopes” (“POSOH” means “hello” in the Menominee language) from the National Institute of Food and Agriculture. The goal of this grant, funded at 4.6 million dollars over five years and carried out in collaboration with the College of Menominee Nation is to strengthen the regional K-16 education system, especially at underserved schools. The premise of the project is that preparing youth for career and business opportunities in bioenergy-related fields can generate transformative new hope within the families and tribal communities of Wisconsin and the Upper Midwest.

5. Snapshot of Biochemistry as a whole on the research front:
--- Publications (minus abstracts,corrections)/Faculty in 2011: 4.9
--- Citations/Faculty in 2011: 360
--- Total extramural research dollars in 2011: ~$18 million direct costs
## Appendix 8
### Biochemistry Faculty Awards Since 1996

<table>
<thead>
<tr>
<th>Name</th>
<th>Awards/Programs</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Richard Amasino</strong></td>
<td>Industrial and Economic Development Program Award, University-Industry Relations, UW-Madison</td>
<td>1998-99</td>
</tr>
<tr>
<td></td>
<td>Wisconsin Distinguished Professor of Biochemistry, UW-Madison</td>
<td>1998</td>
</tr>
<tr>
<td></td>
<td>Alexander von Humboldt Foundation Award</td>
<td>1999</td>
</tr>
<tr>
<td></td>
<td>Vilas Associates Award, University of Wisconsin-Madison</td>
<td>1999-01</td>
</tr>
<tr>
<td></td>
<td>Industrial &amp; Economic Development Program Award, CALS, UW-Madison</td>
<td>00-01</td>
</tr>
<tr>
<td></td>
<td>Wisconsin Distinguished Professor of Biochemistry, UW-Madison</td>
<td>2003</td>
</tr>
<tr>
<td></td>
<td>Hilldale Award in the Biological Sciences, UW-Madison</td>
<td>2005</td>
</tr>
<tr>
<td></td>
<td>Kellett Mid-Career Faculty Researcher Award, UW-Madison</td>
<td>2005</td>
</tr>
<tr>
<td></td>
<td>Howard Hughes Medical Institute Teaching Professor</td>
<td>2006</td>
</tr>
<tr>
<td></td>
<td>Member, National Academy of Sciences</td>
<td>2006</td>
</tr>
<tr>
<td></td>
<td>Alliant Energy Underkoffer Excellence in Teaching Award, UW-Madison</td>
<td>2008</td>
</tr>
<tr>
<td></td>
<td>Spitzer Excellence in Teaching Award, CALS</td>
<td>2008</td>
</tr>
<tr>
<td></td>
<td>Hilldale Professorship</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elected Fellow of the American Society of Plant Biologists</td>
<td>2009</td>
</tr>
<tr>
<td></td>
<td>Elected Fellow of the American Association for the Advancement of Science (AAAS)</td>
<td>2011</td>
</tr>
<tr>
<td></td>
<td>Residence Hall Teaching Award</td>
<td></td>
</tr>
<tr>
<td><strong>Aseem Ansari</strong></td>
<td>Japan Society for the Promotion of Science, Japan</td>
<td>1996</td>
</tr>
<tr>
<td></td>
<td>Basil O’Connor Starter Scholar Award, March of Dimes Foundation, NY</td>
<td>2004-2006</td>
</tr>
<tr>
<td></td>
<td>Research Excellence Award, W. M. Keck Foundation, CA</td>
<td>2005</td>
</tr>
<tr>
<td></td>
<td>Shaw Scientist Award, The Greater Milwaukee Foundation</td>
<td>2006</td>
</tr>
<tr>
<td></td>
<td>Vilas Associates Award, University of Wisconsin-Madison</td>
<td>2006</td>
</tr>
<tr>
<td></td>
<td>Glenn S. Pound Research Award, College of Agriculture and Life Sciences, UW-Madison</td>
<td>2007</td>
</tr>
<tr>
<td></td>
<td>CAREER award, National Science Foundation</td>
<td>2008-2013</td>
</tr>
<tr>
<td></td>
<td>Romnes Faculty Fellowship Award UW-Madison</td>
<td>2011</td>
</tr>
<tr>
<td><strong>Alan Attie</strong></td>
<td>Dave McClain Research Award, American Heart Association/Wisconsin Affiliate</td>
<td>1998</td>
</tr>
<tr>
<td></td>
<td>Vilas Associates Award, University of Wisconsin-Madison</td>
<td>2000-02</td>
</tr>
<tr>
<td></td>
<td>Carl J. Norden Distinguished Teaching Award (Honorable Mention) University of Wisconsin - Madison School of Veterinary Medicine</td>
<td>2001</td>
</tr>
<tr>
<td></td>
<td>Jack Gorski Professorship in Biochemistry, University of Wisconsin-Madison</td>
<td>2009</td>
</tr>
<tr>
<td><strong>Samuel Butcher</strong></td>
<td>Shaw Scientist Award, The Greater Milwaukee Foundation</td>
<td>2002-2007</td>
</tr>
<tr>
<td></td>
<td>Vilas Associates Award, University of Wisconsin-Madison</td>
<td>2010-2012</td>
</tr>
<tr>
<td><strong>Wm Wallace Cleland</strong></td>
<td>Stein and Moore Award from the protein Society</td>
<td>1999</td>
</tr>
<tr>
<td></td>
<td>Hilldale Award in the Physical Sciences, UW-Madison</td>
<td>2001</td>
</tr>
<tr>
<td><strong>Michael Cox</strong></td>
<td>University of Wisconsin Regents Teaching Excellence Award</td>
<td>2009</td>
</tr>
<tr>
<td></td>
<td>Elected Fellow of the American Association for the Advancement of Science (AAAS)</td>
<td>2011</td>
</tr>
<tr>
<td><strong>Elizabeth Craig</strong></td>
<td>Member, American Academy of Microbiology</td>
<td>1998</td>
</tr>
<tr>
<td></td>
<td>Member, National Academy of Sciences</td>
<td>1998</td>
</tr>
<tr>
<td></td>
<td>Member, American Academy of Arts and Sciences</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td>Hilldale Award in the Biological Sciences, UW-Madison</td>
<td>2004</td>
</tr>
<tr>
<td></td>
<td>Elected Fellow of the American Association for the Advancement of Science (AAAS)</td>
<td>2007</td>
</tr>
<tr>
<td><strong>Brian Fox</strong></td>
<td>Glenn S. Pound Research Award, College of Agriculture and Life Sciences, UW-Madison</td>
<td>1997</td>
</tr>
<tr>
<td></td>
<td>National Science Foundation Early Career Development Award</td>
<td>1998-2003</td>
</tr>
<tr>
<td></td>
<td>Marvin J. Johnson Professorship in Fermentation Biochemistry, University of Wisconsin</td>
<td>2001-2020</td>
</tr>
<tr>
<td></td>
<td>Romnes Faculty Fellowship Award UW-Madison</td>
<td>2001-2007</td>
</tr>
<tr>
<td></td>
<td>Vilas Faculty Recruitment and Retention Award, University of Wisconsin.</td>
<td>2008</td>
</tr>
<tr>
<td></td>
<td>Vilas Associates Award, University of Wisconsin-Madison</td>
<td>2009-2011</td>
</tr>
<tr>
<td><strong>Paul Friesen</strong></td>
<td>Glenn S. Pound Research Award, College of Agriculture and Life Sciences, UW-Madison</td>
<td>1996</td>
</tr>
<tr>
<td></td>
<td>Romnes Faculty Fellowship Award UW-Madison</td>
<td>1997</td>
</tr>
<tr>
<td></td>
<td>College of Agriculture &amp; Life Sciences Spitzer Excellence in Teaching Award</td>
<td>1998</td>
</tr>
<tr>
<td></td>
<td>Vilas Associates Award, University of Wisconsin-Madison</td>
<td>2009-2010</td>
</tr>
<tr>
<td><strong>Colleen Hayes</strong></td>
<td>Vilas Associates Award, University of Wisconsin-Madison</td>
<td>1997-99</td>
</tr>
<tr>
<td></td>
<td>American College for the Advancement of Medicine, Harold Harper Award</td>
<td>2004</td>
</tr>
<tr>
<td><strong>Hazel Holden</strong></td>
<td>Kellett Mid-Career Faculty Researcher Award, UW-Madison</td>
<td>2010-2011</td>
</tr>
<tr>
<td><strong>Aaron Hoskins</strong></td>
<td>Hyper Cube Chemistry Scholar Award</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td>NSF Predoctoral Fellowship</td>
<td>2000-2003</td>
</tr>
<tr>
<td></td>
<td>NIH NRSA Postdoctoral Fellowship</td>
<td>2008</td>
</tr>
<tr>
<td></td>
<td>NIH K99/R00 Career Transition Award</td>
<td>2008-</td>
</tr>
<tr>
<td><strong>Laura Kiessling</strong></td>
<td>Zeneca Excellence in Chemistry Award</td>
<td>1996</td>
</tr>
<tr>
<td></td>
<td>Dreyfus Teacher-Scholar Award</td>
<td>1996-2001</td>
</tr>
<tr>
<td>Alfred P. Sloan Foundation Fellowship</td>
<td>1997-99</td>
<td></td>
</tr>
<tr>
<td>Dowd Lecturer, Department of Chemistry, University of Pittsburgh, Pittsburgh, PA</td>
<td>1999</td>
<td></td>
</tr>
<tr>
<td>American Chemical Society, Arthur C. Cope Scholar Award</td>
<td>1999</td>
<td></td>
</tr>
<tr>
<td>MacArthur Foundation Fellowship</td>
<td>1999-2004</td>
<td></td>
</tr>
<tr>
<td>Horace Isbell Award, Carbohydrate Division of the American Chemical Society</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>Romenes Faculty Fellowship Award UW-Madison</td>
<td>2001</td>
<td></td>
</tr>
<tr>
<td>Carbohydrate Research Award for Creativity in Carbohydrate Chemistry</td>
<td>2001</td>
<td></td>
</tr>
<tr>
<td>Elected Fellow of the American Association for the Advancement of Science (AAAS)</td>
<td>2002</td>
<td></td>
</tr>
<tr>
<td>Member, American Academy of Arts and Sciences</td>
<td>2003</td>
<td></td>
</tr>
<tr>
<td>Tetrahedron Young Investigator Award in Bioorganic or Medicinal Chemistry</td>
<td>2005</td>
<td></td>
</tr>
<tr>
<td>Harrison Howe Award, Rochester Section of the American Chemical Society</td>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>Technology Achievement Award, MIT Club of Wisconsin</td>
<td>2007</td>
<td></td>
</tr>
<tr>
<td>Francis P. Garvan–John M. Olin Award, American Chemical Society</td>
<td>2007</td>
<td></td>
</tr>
<tr>
<td>Member, American Academy of Microbiology</td>
<td>2007</td>
<td></td>
</tr>
<tr>
<td>Member, National Academy of Sciences</td>
<td>2007</td>
<td></td>
</tr>
<tr>
<td>Vilas Associates Award, University of Wisconsin-Madison</td>
<td>2008</td>
<td></td>
</tr>
<tr>
<td>Wilbur Cross Award, Yale University</td>
<td>2008</td>
<td></td>
</tr>
<tr>
<td>Member, Wisconsin Academy of the Arts and Sciences</td>
<td>2008</td>
<td></td>
</tr>
<tr>
<td>Guggenheim Fellowship</td>
<td>2008</td>
<td></td>
</tr>
</tbody>
</table>

| Judith Kimble |
| President of the Genetics Society of America | 2000 |
| Vilas Professor, UW-Madison | 2001- |
| American Philosophical Society | 2002 |
| Hilldale Award in the Biological Sciences, UW-Madison | 2002-2003 |
| President of the Society for Developmental Biology | 2004-2005 |
| Elected Fellow of the American Association for the Advancement of Science (AAAS) | 2006 |
| Council, National Academy of Sciences | 2008-2010 |
| Adjunct Professor, National Institute of Genetics, Mishima, Japan | 2009-2010 |
| Committee on Science, Engineering and Public Policy (COSEPUP) | 2009-2011 |
| President's Committee on National Medal of Science | 2012-2014 |

| Robert Landick |
| Member, American Academy of Microbiology | 2003 |
| Elected Fellow of the American Association for the Advancement of Science (AAAS) | 2004 |
| Ira L. Baldwin Professorship of Bacteriology | 2006 |
| Kellett Mid-Career Faculty Researcher Award, UW-Madison | 2006 |
| American Society for Microbiology Division H Lectureship | 2006 |

| John Markley |
| Elected Fellow of the American Association for the Advancement of Science (AAAS) | 2001 |
| Fellow of the Biophysical Society | 2001 |
| Honorary Member, Nuclear Magnetic Resonance Society of Japan | 2004 |
| Fellow of the International Society of Magnetic Resonance | 2009 |
| Honorary Member, National Magnetic Resonance Society (India) | 2009 |

| Thomas Martin |
| McKnight Investigator Award | 1997-2000 |
| Kellett Mid-Career Faculty Researcher Award, UW-Madison | 1999-2004 |
| Wasson Professor of Biochemistry | 2003- |
| Earl W. Sutherland Professor of Biochemistry | 2007- |

| Julie Mitchell |
| Alfred P. Sloan Foundation Fellowship | 2006-2008 |
| Vilas Associates Award, University of Wisconsin-Madison | 2007-2009 |

| David Nelson |
| Brenda Pflaehler Award | 2000 |
| History of Science Society | 2001 |

| James Ntambi |
| University of Wisconsin, College of Agricultural and Life Sciences teaching and mentor Award | 2002 |
| Katherine Berns Von Donk Steenbock Professorship in Nutrition, UW-Madison | 2004 |
| Osborne Mandel Award in Basic Science | 2005 |
| Fulbright Fellow, African Regional Research Award | 2008 |
| College of Agricultural and Life Sciences Extra Mile Award | 2008 |
| Vilas Associates Award, University of Wisconsin-Madison | 2009 |
| College of Agricultural and Life Sciences Award of Excellence in International Activities | 2009 |
| Inducted as a Fellow of the Uganda National Academy of Sciences (FUNAS) | 2010 |
| WAA Chancellor's Distinguished Teaching Award | 2010 |

| David Pagliarini |
| NSF Fellowship, Michigan State University | 1998 |
| NIH/NCI Postdoctoral Fellow | 2008 |
| NIH/ARRA Challenge Grant Recipient | 2009 |
| Searle Scholar Award, Kinship Foundation | 2011 |
| Glenn Award, Glenn Foundation for Medical Research | 2011 |
Shaw Scientist Award, The Greater Milwaukee Foundation 2012

Ann Palmenberg

Vilas Associates Award, University of Wisconsin-Madison 1996
Kellett Mid-Career Faculty Researcher Award, UW-Madison 1997
Awarded American Society for Virology Lifetime Membership 2001
Member, American Academy of Microbiology 2009
Hilldale Award in the Biological Sciences, UW-Madison 2010

George Phillips

Vilas Associates Award, University of Wisconsin-Madison 2003-2005

Ronald Raines

Pfizer Award, American Chemical Society 1998
Romnes Faculty Fellowship Award, UW-Madison 1998-2003
Guggenheim Fellowship, J. S. Guggenheim Memorial Foundation 2001-2002
Elected Fellow of the American Association for the Advancement of Science (AAAS) 2002
Vilas Associates Award, University of Wisconsin-Madison 2002-2004
Arthur C. Cope Scholar Award, American Chemical Society 2004
Emil Thomas Kaiser Award, Protein Society 2005
Fellow, Royal Society of Chemistry (London) 2006
Henry Lardy Professor of Biochemistry, UW-Madison 2006-
Technology Achievement Award, MIT Club of Wisconsin 2007
Rao Makineni Lectureship Award, American Peptide Society 2007
Kellett Mid-Career Faculty Researcher Award, UW-Madison 2009-2014
Repligen Award in Biological Chemistry, American Chemical Society 2010

John Ralph

Elected Fellow of the American Association for the Advancement of Science (AAAS) 2005

Ivan Rayment

Elected Fellow of the American Association for the Advancement of Science (AAAS) 1998
Vilas Associates Award, University of Wisconsin-Madison 1999-2001
Kellett Mid-Career Faculty Researcher Award, UW-Madison 2003-2008
WARF Named Professorship 2012-2017

Thomas Record

Vilas Associates Award, University of Wisconsin-Madison 1998-2000
Founders Award Lecturer, Biophysical Society 2001
Steenbock Professor of Chemical Sciences, UW-Madison 2002-2012
Fellow, Biophysical Society 2005
Fellow, American Academy of Arts and Sciences 2007
Member, American Academy of Arts and Sciences 2007
Member, American Academy of Microbiology 2009

Michael Sussman

UW Graduate School Kellett Mid-Career Award 1996
Vilas Associates Award, University of Wisconsin-Madison 2004-2005
Elected Fellow of the American Association for the Advancement of Science (AAAS) 2005
Appointed to Wisconsin Biofuels Consortium by Governor Doyle 2005-2007

Douglas Weibel

Japan Society for the Promotion of Science (JSPS) Fellow 2006
3M Non-tenured Faculty Award 2008
ICAAC Young Investigator Award, American Society for Microbiology 2008
Searle Scholar Award, Kinship Foundation 2008
DARPA Young Faculty Award, U.S. Department of Defense 2010
Alfred P. Sloan Foundation Fellowship 2010
DuPont Young Professor 2011
Basil O'Connor Award, March of Dimes Foundation 2011
NIH Director's New Innovator Award 2011

Marvin Wickens

Kellett Mid-Career Faculty Researcher Award, UW-Madison 1997-2002
Frontiers Program Lecturer, Texas A & M 1998
Max Perutz Professor of Molecular Biology and Biochemistry, UW-Madison 2003-2008
The RNA Society Lifetime Service Award 2007
Hilldale Award, UW-Madison 2008
Member, American Academy of Arts and Sciences 2011

Jill Wildonger

Ruth L. Kirschstein National Research Service Award 2007
NIH Pathway to Independence Award 2010
Appendix 9

Department of Biochemistry

Policies and Procedures for the Guidance, Annual Evaluation, and Consideration for Promotion of Probationary Faculty

The Department of Biochemistry sets high standards for promotion to tenure and exercises correspondingly stringent selection criteria in hiring, designed to identify the most talented and promising scientists for new tenure track assistant professor appointments. The Department also makes every effort to support the work and promote the progress of its junior faculty and endeavors to provide the resources, the intellectual environment, and the collegial encouragement and guidance that will allow its young professors to realize their full potential as scholars and teachers. The Department expects a commitment to excellence and superior professional accomplishments from its faculty, and hopes that its probationary appointees will be able to present a record of achievement in research, teaching, and service that meets departmental standards and will justify favorable action with respect to promotion to the rank of associate professor with tenure.

I. General Policies and Outline of the Tenure Review Process

Biochemistry Department policies relating to the guidance, evaluation, and promotion of tenure track assistant professors are governed by the official Faculty Policies and Procedures (FPP) of the University of Wisconsin-Madison. Current departmental practices conform to both the general guidelines and the specific rules of the FPP, and all junior faculty members are urged to become familiar with that document, especially chapter 7, on "Faculty Appointments", which sets forth the University's regulations concerning the evaluation and advancement (or non-retention) of faculty on probationary status.

The standard maximum probationary appointment period at the University of Wisconsin-Madison is seven years, but this standard period may be abridged or extended under certain circumstances (see FPP, 7.04). Absent such adjustments, tenure track assistant professors in the Biochemistry Department are offered an initial three-year appointment, which is normally renewed for a second three-year term, given the candidate's reasonable progress and generally satisfactory performance. The Department may review and act on a probationary faculty member’s appointment at any time, but a decision regarding promotion to tenure (or non-retention) must be reached at least one year before the end of the candidate’s maximum probationary period, i.e., normally before or by the end of the sixth year. The granting of tenure requires review and positive approval at three levels: (1) the candidate's department, (2) his/her faculty division, and (3) the Dean of the College. At the departmental level, the decision is the responsibility and the prerogative of the Executive Committee, consisting of all tenured professors on active status. As described in greater detail below (Section II), tenure decisions in the Biochemistry Department are based on the continual monitoring and assessment of the
candidate's performance, culminating in a final comprehensive review and formal vote by the Executive Committee. Departmental rules require that a motion recommending promotion to associate professor and tenure must pass with a 2/3 majority of the votes cast. An adverse decision by the departmental Executive Committee is final, and it ends the tenure review process (i.e., precludes further review at the level of the faculty division and/or the Dean), but the case may be deferred for reconsideration at a later time (if such action is possible within the limit of the candidate’s probationary period), and the candidate has rights of appeal as specified in FPP, chapter 7. A positive departmental decision is forwarded as a recommendation to the Dean of the College of Agricultural and Life Sciences, who in turn refers the matter to the executive committee of the candidate's faculty division (Biochemistry faculty are members of either the Division of the Biological Sciences or the Division of the Physical Sciences; see also FPP, chapter 4). After completing an independent review of the case (based on the tenure dossier submitted by the Department), the divisional executive committee communicates its decision on the candidate's suitability for promotion and tenure to the Dean, who normally takes action in accord with the divisional committee's advice. An adverse decision by the divisional committee can be appealed, and the Department will do so if, in the judgment of its Executive Committee, the facts of the case warrant such action. If promotion to associate professor and tenure is denied at any level (and upheld upon requested reconsideration or appeal) the candidate's employment with the University of Wisconsin terminates after one additional year of appointment as assistant professor to allow time for the completion of ongoing studies and for the orderly transition to another position elsewhere.

II. Specific Departmental Guidance and Evaluation Procedures

Soon after the start of a probationary faculty member's initial appointment (i.e., normally during the first semester in residence), the department chair appoints an ad hoc tenure committee consisting of 3-4 tenured professors – the exact number depending on the diversity of expertise needed for a proper assessment of the candidate's work. One of the members of the tenure committee will be appointed by the department chair to serve as a mentor for the candidate. As far as possible, the membership of the tenure committee remains unchanged throughout the candidate's probationary period. This committee has the responsibility of monitoring and evaluating the candidate's performance, of making an annual report to the Executive Committee on the candidate's progress and prospects, and of giving the candidate all possible advice and guidance toward achieving tenure. The mentor will, in addition, offer personal guidance, encouragement, and support for the candidate. The tenure committee meets with the candidate at least once a year and reviews all aspects of his/her professional work – research, teaching, service – based on documentation requested from and compiled by the candidate. Important factors relevant to the committee's assessment of the candidate's accomplishments in research are the candidate's publication record, his/her progress in the development of an original research program and productive research group, his/her efforts and success in securing competitive grant support, invited lectures at conferences or institutions, honors and awards, and other indications of peer recognition. For its assessment of the candidate's teaching performance, the committee relies on the results of student evaluations and information from at least two faculty peer reviewers who attend selected lectures in the candidate's formal course(s) throughout his/her probationary period. These teaching peer reviewers may be members of the tenure committee or
other tenured faculty who, upon tenure committee request, have agreed to serve in that capacity. Based on its review, the committee annually prepares a written report that is presented to the Executive Committee. After Executive Committee discussion, possible modification, and approval (by formal vote), the report is added to the candidate's departmental tenure file, and a copy of it is provided to the candidate. The candidate may respond in writing to this report, and any such response will be included in the official tenure file. As part of this regular evaluation and guidance process, the candidate will also be kept informed (directly by the Chair or via the tenure committee) of any changes in the Department’s mission or goals that may affect his/her prospects for promotion to tenure.

Whenever in the judgment of the tenure committee the candidate's record warrants his/her consideration for promotion (but, in any case, no later than the penultimate year of the probationary appointment period), the committee initiates a comprehensive review of the candidate's credentials. The committee assembles (with the candidate's assistance) a complete dossier of information that includes the description and documentation of research accomplishments, a full record of his/her teaching performance (including student and faculty evaluations), and of university/professional service and outreach contributions. This dossier, together with the tenure committee's recommendation, is presented to the Executive Committee for an initial review. The expected result of this first review is the Executive Committee's decision (by a simple majority of the votes cast) whether the case for promotion and tenure is sufficiently strong to warrant the solicitation of reference letters from external experts in the candidate's field. An adverse vote at this stage (i.e., a decision against the solicitation of reference letters) expresses the Executive Committee's collective professional judgment that the candidate's record of performance and accomplishments does not meet the Department's standards for granting tenure, and unless the candidate's remaining probationary period allows for the deferment and later reconsideration of the case, the Committee's negative vote on the question of the reference letters represents a final decision against promotion to associate professor and tenure.

Executive Committee approval of the solicitation of reference letters initiates the second phase of review of the candidate's qualifications. The Department chair (with assistance of the tenure committee) requests the required letters from leading experts, and the candidate is requested to present a public lecture on his research program and accomplishments as assistant professor. The Executive Committee then undertakes a second and final review of all relevant information (including the letters) that leads to a decision on the question of promotion. As stated above, a recommendation in favor of promotion to associate professor with tenure requires a 2/3 majority of the votes cast; a vote not meeting that requirement means that promotion is denied. A favorable decision, together with the required comprehensive documentation in the format mandated by the candidate's faculty division, is communicated to the Dean for further review and action, as summarized in the preceding section. An adverse decision at any stage of the Department's tenure review process can be appealed by the candidate in accord with the procedures specified in FPP, chapter 7.

III. Biochemistry Department Criteria for Promotion to Tenure
A recommendation for promotion to tenure in the Biochemistry Department expresses the Executive Committee's collective professional judgment that the candidate's record of performance and accomplishments reflects high achievement in research, teaching and service; that these efforts have garnered significant national (and the promise of international) recognition; and that, through this high level of achievement, the candidate is poised for continued and increasing contributions throughout their scholarly career.

1. Evidence of a high level of achievement in research (i.e. a demonstrable impact on an area of study and a likelihood of future distinction) should include the following:

   - Publication in high-quality, peer-reviewed journals.
   - Funding from external, peer-reviewed, competitive grant programs at the national level.
   - Presentation of invited lectures or seminars at other universities and national or international meetings.
   - Letters from leading scientists in the candidate’s field attesting to the quality and excellence of research accomplished and on-going.

2. Evidence of a high level of achievement in teaching (i.e. a demonstrable evidence of a strong motivation to engage students in the learning process) should include the following:

   - For classroom teaching, positive course evaluations by the students and peer reviews provided by the tenure committee and/or an internal reviewer(s), and examples of innovation in teaching.
   - For mentor teaching, graduate student or postdoctoral work produced in the laboratory and the timeliness with which the work is published.

3. Evidence of a high level of achievement in service is demonstrated by contributions to the scientific community, department, college, and university.

February 2011
Appendix 10
Seminars
Table of Contents

David Green Lecture in Enzyme Chemistry ........................................ 2 - 6
Jim Wells
Chaitan Khosla
Tadgh Begley
Cathy Drennan
Michael Marletta

Harry Steenbock Lectures in Biochemistry ......................................... 7 - 13
Jack Dixon
Chris Walsh
David Baker
Michael Czech
Peter Schultz
Frances Arnold
Roderick MacKinnon

Everson Lecture in Biochemistry ...................................................... 14 - 22
David Zarkower
Andrew P. Hinck
Jason Gestwicki
Vahe Bandarian
Timothy Lohman
Joanne Stubbe
Christian Raetz
Stephen Sturley
Charles Hoogstraten


Steenbock Symposium ...................................................................... 33 - 61
  35th: Advances in Biomolecular NMR
  34th: The Metabolism of Lipids
  33rd: Synthetic Genes to Synthetic Life
  32nd: Dynamics of Proteins and Macromolecular Assemblies
  31st: Fe-S Proteins: Biogenesis, Structure and Function
  30th: Gene Expression, Transposition, Genomic and Other Life Sciences
  29th: Coenzymes, Cofactors and Catalysis
  28th: Intracellular Protein and Lipid Traffic
The David Green Lecture in Enzyme Chemistry
at the University of Wisconsin-Madison

Engineering Cells to Death

Jim Wells
University of California, San Francisco

Monday, May 16th at 3:30 PM

Ebling Symposium Center, Microbial Sciences Building

Contact - Mike Cox (cox@biochem.wisc.edu)
Sponsored by the David E. Green Memorial Lecture Fund

In compliance with the Americans with Disabilities Act, the UW-Madison will make every effort to honor requests for reasonable accommodations made by individuals with disabilities. Requests can be addressed more effectively if received as far in advance of the event as possible, preferably at least one week. Direct accommodation requests to the Biochemistry Office, 608-262-3040.
The David Green Lecture in Enzyme Chemistry
at the University of Wisconsin-Madison

Chaitan Khosla
Departments of Chemical Engineering and Chemistry
Stanford University

Modularity of Polyketide Synthases: Twenty Years On

Monday, February 8th at 3:30 PM
Ebling Symposium Center
Microbial Sciences Building

Contact - Doug Weibel (weibel@biochem.wisc.edu)
Sponsored by the David E. Green Memorial Lecture Fund
The David Green Lecture in Enzyme Chemistry

Tadgh Begley
Departments of Chemistry and Chemical Biology, Cornell University

Thiamin Biosynthesis—Still Yielding Fascinating Biological Chemistry

Monday, May 4th at 3:30 pm
Room 1420, Microbial Sciences Building, UW-Madison
Contact - Doug Weibel (weibel@biochem.wisc.edu)

Sponsored by the David E. Green Memorial Lecture Fund
The David Green Lecture in Enzyme Chemistry

Dr. Cathy Drennan
Massachusetts Institute of Technology

Monday, March 31st at 3:30 pm
B1118 Biochemistry, 420 Henry Mall, UW-Madison
Contact - Ron Raines (raines@biochem.wisc.edu)

Sponsored by the David E. Green Memorial Lecture Fund

Crystallographic Snapshots of Natural Product Biosynthesis
The David Green Lecture in Enzyme Chemistry

Michael Marletta
University of California-Berkeley

Monday, February 5th at 3:30 pm
B1118 Biochemistry, 420 Henry Mall, UW-Madison
Contact - Sally Wedde (sewedde@wisc.edu)

On the Path to Sorting Out NO Signaling. Twists, Turns and Unexpected Deviations

Sponsored by the David E. Green Memorial Lecture Fund
Protein Tyrosine Phosphatases: Their Roles in Health and Disease
3:30 pm Monday, May 14, 2012

Are You Kidding Me: A New Kinase Family?
3:30 pm Tuesday, May 15, 2012

Ebling Symposium Center, Microbial Sciences Building
For more information contact: Dave Pagliarini pagliarini@wisc.edu
HARRY STEENBOCK
LECTURES IN BIOCHEMISTRY
at the University of Wisconsin-Madison

Chris Walsh
Harvard Medical School
The Chemical Logic and Enzymatic Machinery of Peptide Antibiotic Biosyntheses:

Converting Ribosomal Precursors into Thiazoyl Peptide Antibiotics; A Cascade of Posttranslational Modifications
3:30 pm Monday, May 2, 2011

Nonribosomal Peptide Antibiotics; Three Biosynthetic Short Stories
3:30 pm Tuesday, May 3, 2011

Ebling Symposium Center, Microbial Sciences Building
For more information contact: Ron Raines rtraines@wisc.edu
Computing Structural Biology
3:30 pm Monday, March 1, 2010
Ebling Symposium Center,
Microbial Sciences Building

Computational Design of Novel Enzyme Catalysts
3:30 pm Tuesday, March 2, 2010
Room 1111 Biotechnology Center

For more information contact: Alessandro Senes senes@wisc.edu
HARRY STEENBOCK
LECTURES IN BIOCHEMISTRY
at the University of Wisconsin-Madison

Michael Czech
University of Massachusetts Medical School

RNAi-based approaches to inflammation and metabolic diseases
3:30 pm Monday, April 6, 2009

How lipid droplet proteins control energy metabolism
3:30 pm Tuesday, April 7, 2009
Ebling Symposium Center, Microbial Sciences Building

For more information contact: Alan Attie attie@biochem.wisc.edu
An Expanding Genetic Code
3:30 pm Monday, April 14, 2008
Ebling Symposium Center, Microbial Sciences Building

Chemical Approaches to Stem Cell Biology
2:00 pm Tuesday, April 15, 2008
Ebling Symposium Center, Microbial Sciences Building

For more information contact: Aseem Ansari ansari@biochem.wisc.edu
HARRY STEENBOCK
LECTURES IN BIOCHEMISTRY
at the University of Wisconsin-Madison

Caltech

Engineering by Evolution
3:30 pm Monday, April 28, 2008
Ebling Symposium Center, Microbial Sciences Building

Synthetic Protein Families by Structure-Guided Recombination
2:00 pm Tuesday, April 29, 2008
Ebling Symposium Center, Microbial Sciences Building

For more information contact: Doug Weibel weibel@biochem.wisc.edu
Ion Conduction and Selectivity in K+ Channels
3:30 pm Monday, April 9, 2007
Room B1118 Biochemistry

Principles of Gating in K+ Channels
3:30 pm Tuesday, April 10, 2007
Room B1118 Biochemistry

For more information contact: George Phillips phillips@biochem.wisc.edu
Everson Lecture in Biochemistry

Monday, April 18th, 3:30
Ebling Symposium Center, Microbial Sciences Building, UW-Madison

Dr. David Zarkower
University of Minnesota

Venus or Mars: Sex Determination in Worms, Mammals, and Beyond

Contact: Judith Kimble (608)262-6188 kimble@biochem.wisc.edu
Everson Lecture in Biochemistry

Monday, April 4th, 3:30
Ebling Symposium Center, Microbial Sciences Building, UW-Madison

Dr. Andrew P. Hinck
University of Texas - San Antonio

Diversifying function within the TGF-β superfamily, one receptor at a time

Contact: John Markley (608)263-9349 markley@biochem.wisc.edu
Everson Lecture in Biochemistry

Monday, April 5th, 3:30
Ebling Symposium Center, Microbial Sciences Building, UW-Madison

Dr. Jason Gestwicki
University of Michigan

Molecular Chaperones and Protein Folding in Neurodegenerative Disease

Contact: Laura Kiessling, (608)262-0541, kiessling@chem.wisc.edu
Everson Lecture in Biochemistry

Monday, May 3rd, 3:30
Ebling Symposium Center, Microbial Sciences Building, UW-Madison

Dr. Vahe Bandarian
University of Arizona

Unraveling Nature’s Paradigm for Biosynthesis of 7-Deazapurines

Contact: George Reed, (608)262-0509, ghreed@wisc.edu
Everson Lecture in Biochemistry

Monday, March 30th, 3:30
Ebling Symposium Center, Microbial Sciences Building, UW-Madison

Dr. Timothy Lohman
Washington University, St. Louis

SF1 Helicases and Translocases: Mechanisms and Regulation

DNA Unwinding

ssDNA Translocation

Rec A filament disassembly

Contact: Tom Record, (608)262-5332, record@biochem.wisc.edu
Everson Lecture in Biochemistry

Monday, April 21, 2008, 3:30
Ebling Symposium Center, Microbial Sciences Building, UW-Madison

Dr. Joanne Stubbe
Massachusetts Institute of Technology

Ribonucleotide Reductases: Something for Everyone

Contact: Laura Kiessling, (608) 262-0541, kiessling@biochem.wisc.edu
Everson Lecture in Biochemistry

Monday, March 3, 2008, 3:30
Room B1118  Biochemistry, 420 Henry Mall, UW-Madison

Dr. Christian Raetz

Duke University
Department of Biochemistry

Structure and Inhibition of Enzymes that Assemble Bacterial Endotoxins:
Potent Lipid Activators of Innate Immunity

Contact: Brian Fox, (608)262-9708, bgfox@biochem.wisc.edu
Dr. Stephen Sturley

Department of Pediatrics, Institute of Human Nutrition, Columbia University, College of Physicians and Surgeons

http://www.cumc.columbia.edu/dept/ihn/faculty/sturley.html

Unforeseen Pathways of Eukaryotic Lipid Transport and Metabolism: Novel Insights from Yeast

Contact: Alan Attie, (608)262-1372, attie@biochem.wisc.edu
Everson Lecture in Biochemistry

Monday, February 19, 2007–3:00
Room B1118  Biochemistry, 420 Henry Mall, UW-Madison

Dr. Charles Hoogstraten
Assistant Professor, Department of Biochemistry and Molecular Biology, Michigan State University

Three Dimensions are Not Enough:
The Role of Dynamics in RNA Catalysis

Contact: Sam Butcher, (608)263-3890, butcher@biochem.wisc.edu
<table>
<thead>
<tr>
<th>DATE</th>
<th>SPEAKER</th>
<th>TITLE</th>
<th>HOST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 17</td>
<td>Juleen Zierath</td>
<td>Gene and Environmental Factors Influencing Insulin Sensitivity</td>
<td>Attie</td>
</tr>
<tr>
<td></td>
<td>Karolinska Institutet, SE</td>
<td>Khorana Auditorium, Room 175, Biochemistry Addition</td>
<td></td>
</tr>
<tr>
<td>Jan. 24</td>
<td>David Chan</td>
<td>Mitochondrial Dynamics and mtDNA Stability</td>
<td>Weibel</td>
</tr>
<tr>
<td></td>
<td>California Institute of Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 1</td>
<td>Ben Cravatt</td>
<td>Activity-based Proteomics: Applications for Enzyme and Inhibitor Discovery</td>
<td>Pagliarini</td>
</tr>
<tr>
<td></td>
<td>Scripps Research Institute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 7</td>
<td>Abbas Ourmazd</td>
<td>Biostructure and Dynamics from Random Snapshots</td>
<td>Phillips</td>
</tr>
<tr>
<td></td>
<td>UW-Milwaukee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 14</td>
<td>Grover Waldrop</td>
<td>A Tale of Two Functions: Enzymatic Activity or Translational Repression by a Biotin-Dependent Enzyme</td>
<td>Cleland</td>
</tr>
<tr>
<td></td>
<td>Louisiana State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 21</td>
<td>Ming Lei</td>
<td>Party in the End Zone: Structure and Function of Telomere Proteins</td>
<td>Keck</td>
</tr>
<tr>
<td></td>
<td>University of Michigan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 28</td>
<td>Domenico Accili</td>
<td>TBA</td>
<td>Attie</td>
</tr>
<tr>
<td></td>
<td>Columbia University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 7</td>
<td>Tanja Kortemme</td>
<td>Design and Engineering of Proteins, Interactions, and Networks</td>
<td>Mitchell</td>
</tr>
<tr>
<td></td>
<td>University of California-San Francisco</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 14</td>
<td>Josh Kaplan</td>
<td>Building a Dynamic Picture of a C.Elegans Synapse</td>
<td>Audya</td>
</tr>
<tr>
<td></td>
<td>Harvard University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 21</td>
<td>Dustin Maly</td>
<td>Chemical Tools for Studying Signaling Enzymes</td>
<td>Kiessling</td>
</tr>
<tr>
<td></td>
<td>University of Washington</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 28</td>
<td>Robert Jernigan</td>
<td>Functional Motions of Biomolecular Structures</td>
<td>Senes</td>
</tr>
<tr>
<td></td>
<td>Iowa State University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apr. 4</td>
<td>Andrew Hinck</td>
<td>EVERSON LECTURER</td>
<td>Markley</td>
</tr>
<tr>
<td></td>
<td>U of TX-San Antonio</td>
<td>Diversifying Function Within the TGF-β Superfamily, One Receptor At a Time</td>
<td></td>
</tr>
<tr>
<td>Apr. 11</td>
<td>James Chen</td>
<td>SPATIOTEMPORAL RESOLUTION OF THE EMBRYONIC TRANSCRIPTOME USING CAGED MORPHOLINOS</td>
<td>Kiessling</td>
</tr>
<tr>
<td></td>
<td>Stanford</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apr. 18</td>
<td>David Zarkower</td>
<td>EVERSON LECTURER</td>
<td>Kimble</td>
</tr>
<tr>
<td></td>
<td>University of Minnesota</td>
<td>Venus or Mars: Sex Determination in Worms, Mammals, and Beyond</td>
<td></td>
</tr>
<tr>
<td>Apr. 25</td>
<td>David Auble</td>
<td>Regulation of Transcription Complex Assembly and Dynamics</td>
<td>Brow</td>
</tr>
<tr>
<td></td>
<td>University of Virginia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May 2-3</td>
<td>Chris Walsh</td>
<td>STEENBOCK LECTURER</td>
<td>Raines</td>
</tr>
<tr>
<td></td>
<td>Harvard</td>
<td>The Chemical Logic and Enzymatic Machinery of Peptide Antibiotic Biosyntheses</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5/2: Converting Ribosomal Precursors into Thiazoyl Peptide Antibiotics; A Cascade of Posttranslational Modifications</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5/3: Nonribosomal Peptide Antibiotics; Three Biosynthetic Short Stories</td>
<td></td>
</tr>
<tr>
<td>May 9</td>
<td>Craig Pikaard</td>
<td>Roles of RNA Polymerases IV and V in siRNA-Mediated Gene Silencing in Plants</td>
<td>Landick</td>
</tr>
<tr>
<td></td>
<td>Indiana University, Bloomington</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May 16</td>
<td>Jim Wells</td>
<td>GREEN LECTURER</td>
<td>Cox</td>
</tr>
<tr>
<td></td>
<td>University of California-San Francisco</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Lecture Series is sponsored by the Harry Steenbock Lecture Fund and the Molecular Biosciences Training Grant

Contact host to speak with visitor
<table>
<thead>
<tr>
<th>DATE</th>
<th>SPEAKER</th>
<th>TITLE</th>
<th>HOST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 25</td>
<td>Amy Keating</td>
<td>Measuring, Modeling and Designing Protein-Protein Interaction Specificity of the bZIP Transcription Factors</td>
<td>Senes</td>
</tr>
<tr>
<td>Feb. 1</td>
<td>Myron Goodman</td>
<td>Captured Alive the Active Form of Pol V Reveals the Mutagenic Mechanism of the RecA Nucleoprotein Filament in the SOS Response</td>
<td>Cox</td>
</tr>
<tr>
<td>Feb. 8</td>
<td>Chaitan Khosla</td>
<td>Green Lecture Modularity of Polyketide Synthases: Twenty Years On</td>
<td>Weibell</td>
</tr>
<tr>
<td>Feb. 15</td>
<td>Deborah Thurmond</td>
<td>Vesicle Exocytosis Impacts Glucose Homeostasis and Longevity</td>
<td>Attie</td>
</tr>
<tr>
<td>Feb. 22</td>
<td>William DeGrado</td>
<td>De Novo of Proteins and Protein Mimics</td>
<td>Fox</td>
</tr>
<tr>
<td>Mar. 1</td>
<td>David Baker</td>
<td>Steenbock Lecture Computing Structural Biology Lecture at Ebling Symposium Center</td>
<td>Kimble &amp; Senes</td>
</tr>
<tr>
<td>Mar. 2</td>
<td></td>
<td>De Novo Design of Novel Enzyme Catalysts Lecture at Biotechnology Auditorium</td>
<td></td>
</tr>
<tr>
<td>Mar. 8</td>
<td>Oliver Fiehn</td>
<td>Metabolic Dynamics of Stress Response in <em>Chlamydomonas Reinhardtii</em> Assessed by Metabolomics and Proteomics</td>
<td>Sussman</td>
</tr>
<tr>
<td>Mar. 15</td>
<td>Anna Mapp</td>
<td>Catching Transcriptional Activators in the Act</td>
<td>Raines</td>
</tr>
<tr>
<td>Mar. 22</td>
<td>Randall Peterson</td>
<td>Zebrafish Chemical Biology--An <em>In Vivo</em> Approach to Small Molecule Discovery</td>
<td>Weibell</td>
</tr>
<tr>
<td>Apr. 5</td>
<td>Jason Gestwicki</td>
<td>Everson Lecture Molecular Chaperones and Protein Folding in Neurodegenerative Disease</td>
<td>Kiessling</td>
</tr>
<tr>
<td>Apr. 12</td>
<td>Hashim Al-Hashimi</td>
<td>A Unified Framework for Predicting RNA Structure, Dynamics and Adaptive Recognition</td>
<td>Butcher</td>
</tr>
<tr>
<td>Apr. 19</td>
<td>Todd Michael</td>
<td>Exploring Plant Genomes with High-throughput Sequencing</td>
<td>Amasino</td>
</tr>
<tr>
<td>Apr. 26</td>
<td>Susan Gilbert</td>
<td>Mitotic Kinesin CENP-E Promotes Microtubule Elongation</td>
<td>Rayment</td>
</tr>
<tr>
<td>May 3</td>
<td>Vahe Bandarian</td>
<td>Deciphering the Biosynthetic Pathways for 7-Deazapurine-Containing Secondary Metabolites</td>
<td>Holden &amp; Reed</td>
</tr>
</tbody>
</table>

All talks Monday at 3:30, Ebling Symposium Center, Microbial Sciences Building, 1550 Linden Drive
Sponsored by the The Harry Steenbock Lecture Fund and the Molecular Biosciences Training Grant
Contact host to speak with visitor
<table>
<thead>
<tr>
<th>DATE</th>
<th>SPEAKER</th>
<th>TITLE</th>
<th>HOST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 9</td>
<td>Alvin C. Powers</td>
<td>Pancreatic Islets-Vascularization, Innervation, and Regeneration</td>
<td>Alan Attie</td>
</tr>
<tr>
<td></td>
<td>Vanderbilt Diabetes Ctr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 16</td>
<td>TBA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 23</td>
<td>Jon Thorson</td>
<td>Differential Glycosylation of Bioactive Molecules: Strategies, Challenges and Opportunities</td>
<td>George Phillips</td>
</tr>
<tr>
<td></td>
<td>UW-Madison, Pharmacy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 2</td>
<td>TBA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 9</td>
<td>Josh Coon</td>
<td>Innovative Technologies for the Large-scale Study of Protein Post-Translational Modification</td>
<td>Judith Kimble</td>
</tr>
<tr>
<td></td>
<td>UW-Madison, Chemistry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 23</td>
<td>Brenda Bass</td>
<td>TBA</td>
<td>Marv Wickens</td>
</tr>
<tr>
<td>Mar 30</td>
<td>Timothy Lohman</td>
<td>Everson Lecture: SF1 Helicases and Translocases: Mechanisms and Regulation</td>
<td>Tom Record</td>
</tr>
<tr>
<td></td>
<td>Washington University,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>St. Louis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mon. and</td>
<td>Michael Czech</td>
<td>Steenbock Lecture: TBA</td>
<td>Alan Attie</td>
</tr>
<tr>
<td>Tues.</td>
<td>University of MA,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 6 &amp;</td>
<td>Medical School</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 7</td>
<td>Grant Jensen</td>
<td>How Electron Cryomicroscopy is Opening a New Window Into Bacterial and Viral Ultrastructure</td>
<td>Doug Weibel</td>
</tr>
<tr>
<td></td>
<td>Caltech</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 20</td>
<td>Mark Winey</td>
<td>Phosphorylation Control of the Yeast Centrosome</td>
<td>Ivan Rayment</td>
</tr>
<tr>
<td></td>
<td>Univ. Colorado-Boulder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 27</td>
<td>Liang Tong</td>
<td>Structural Studies of Fatty Acid Metabolism and Relevance to the Obesity Epidemic</td>
<td>W. Wallace Cleland</td>
</tr>
<tr>
<td></td>
<td>Columbia University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May 4</td>
<td>Tadgh Begley</td>
<td>Green Lecture: Thiamin Biosynthesis-Still Yielding Fascinating New Biological Chemistry</td>
<td>Doug Weibel</td>
</tr>
<tr>
<td></td>
<td>Cornell University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June 18</td>
<td>Kevan Shokat</td>
<td>Student sponsored</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td>UC-San Francisco</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All talks Monday at 3:30, Ebling Symposium Center, Microbial Sciences Building, 1550 Linden Drive
Sponsored by the Steenbock Lecture Fund and the Molecular Biosciences Training Grant
Contact host to speak with visitor
<table>
<thead>
<tr>
<th>DATE</th>
<th>SPEAKER</th>
<th>TITLE</th>
<th>HOST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 28</td>
<td>Robert Powers</td>
<td>Protein Functional Annotation using NMR Ligand Affinity Screens</td>
<td>John Markley</td>
</tr>
<tr>
<td></td>
<td>Univ. NE-Lincoln</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 4</td>
<td>Sarah O’Connor</td>
<td>Alkaloid Biosynthesis in Madagascar Periwinkle</td>
<td>Laura Kiessling</td>
</tr>
<tr>
<td></td>
<td>MIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 11</td>
<td>Rohit Kulkarni</td>
<td>Role of Insulin and Leptin Signaling in Islets – Implications for the Pathogenesis of Type 2 Diabetes and Obesity-Associated Diabetes</td>
<td>Alan Attie</td>
</tr>
<tr>
<td></td>
<td>Harvard Medical School</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 18</td>
<td>Alvin C. Powers</td>
<td>Pancreatic Islets: Vascularization, Revascularization, and Regeneration</td>
<td>Alan Attie</td>
</tr>
<tr>
<td></td>
<td>Vanderbilt Univ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb. 25</td>
<td>Milan Mrksich</td>
<td>Label-Free Detection of Protein-Protein Interactions on Bio Chips</td>
<td>Doug Weibel</td>
</tr>
<tr>
<td></td>
<td>Univ. of Chicago</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 3</td>
<td>Christian Raetz</td>
<td>Everson Lecture Structure and Inhibition of Enzymes that Assemble Bacterial Endotoxins: Potent Lipid Activators of Innate Immunity</td>
<td>Brian Fox</td>
</tr>
<tr>
<td></td>
<td>Univ. of CO-Boulder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 10</td>
<td>Rebecca Heald</td>
<td>Mechanisms of Mitotic Spindle Assembly and Function</td>
<td>Chris Wiese</td>
</tr>
<tr>
<td></td>
<td>UC-Berkeley</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 24</td>
<td>Oliver Hobot</td>
<td>Gene Regulatory Mechanisms that Control Neuronal Diversification in C.elegans</td>
<td>Judith Kimble</td>
</tr>
<tr>
<td></td>
<td>Columbia Univ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wed.</td>
<td>Tom Rapoport</td>
<td>Student sponsored Structure and Function of a Protein Conducting Channel</td>
<td>Greg Kabachinski</td>
</tr>
<tr>
<td>Mar 26</td>
<td>2 p.m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 31</td>
<td>Cathy Drennan</td>
<td>David E. Green Lecture Crystallographic Snapshots of Natural Product Biosynthesis</td>
<td>Ron Raines</td>
</tr>
<tr>
<td></td>
<td>MIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 7</td>
<td>Howard Berg</td>
<td>Using Fluorescence to Study Bacterial Chemotaxis</td>
<td>Doug Weibel</td>
</tr>
<tr>
<td></td>
<td>Harvard Univ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mon &amp; Tue</td>
<td>Peter G. Schultz</td>
<td>Steenbock Lecture Lecture 1: An Expanding Genetic Code Lecture 2: Chemical Approaches to Stem Cell Biology</td>
<td>Aseem Ansari</td>
</tr>
<tr>
<td>April 14 &amp;</td>
<td>Scripps Research Inst.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 21</td>
<td>Joanne Stubbe</td>
<td>Everson Lecture Ribonucleotide Reductases: Something for Everyone</td>
<td>Laura Kiessling</td>
</tr>
<tr>
<td></td>
<td>MIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mon &amp; Tue</td>
<td>Frances Arnold</td>
<td>Steenbock Lecture Lecture 1: Engineering by Evolution Lecture 2: Synthetic Protein Families by Structure-Guided Recombination</td>
<td>Doug Weibel</td>
</tr>
<tr>
<td>April 28 &amp;</td>
<td>Caltech</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May 5</td>
<td>Karen Oegema</td>
<td>Using the C.elegans Embryo to Dissect Cell Division Mechanisms</td>
<td>Judith Kimble</td>
</tr>
<tr>
<td></td>
<td>UC-San Diego</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Lecture Series is sponsored by the Harry Steenbock Lecture Fund and Molecular Biosciences Training Grant. Location and time will be noted on individual seminar notices. Contact host to speak with visitor.
<table>
<thead>
<tr>
<th>Date</th>
<th>Speaker</th>
<th>Title</th>
<th>Host</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/22</td>
<td>Dyche Mullins</td>
<td>The Secret Life of Actin</td>
<td>Weibel</td>
</tr>
<tr>
<td>1/29</td>
<td>Jamie Williamson</td>
<td>Assembly Dynamics of an RNP Machine</td>
<td>Wickens</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/5</td>
<td>Michael Marletta</td>
<td>On the Path to Sorting Out NO Signaling, Twists, Turns and Unexpected Deviations</td>
<td>Kiessling</td>
</tr>
<tr>
<td>2/12</td>
<td>Chad Rienstra</td>
<td>Structure Determination of Nanocrystals, Fibrils and Membrane Proteins by Magic-Angle Spinning Solid-State NMR</td>
<td>Markley</td>
</tr>
<tr>
<td>2/19</td>
<td>Charles Hoogstraten</td>
<td>Three Dimensions are not Enough: The Role of Dynamics in RNA Catalysis</td>
<td>Butcher</td>
</tr>
<tr>
<td>2/26</td>
<td>Elizabeth Craig</td>
<td>Hsp70 Chaperone Machineries: Putting a Biochemical Property to Many Uses Within the Cell</td>
<td>Kiessling</td>
</tr>
<tr>
<td>3/5</td>
<td>Jack Taunton</td>
<td>How Actin Filament Networks Push and Pull on Cellular Membranes</td>
<td>Kiessling</td>
</tr>
<tr>
<td>3/12</td>
<td>Zemer Gitai</td>
<td>Cell Biology of the Bacterial Actin Cytoskeleton</td>
<td>Weibel</td>
</tr>
<tr>
<td>3/19</td>
<td>Tarun Kapoor</td>
<td>Chemical Biology of Cell Division</td>
<td>Raines</td>
</tr>
<tr>
<td>3/26</td>
<td>Amy Pasquinelli</td>
<td>MicroRNAs: A Small Contribution from Worms</td>
<td>Wickens</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/4 Wed.</td>
<td>Roger Tsien</td>
<td>Building Molecules to Spy on Cells and Tumors</td>
<td>Kabachinski</td>
</tr>
<tr>
<td>4/9</td>
<td>Roderick MacKinnon</td>
<td>Lecture 1: Ion Conduction and Selectivity in K+ Channels</td>
<td>Phillips</td>
</tr>
<tr>
<td>4/16</td>
<td>Ondine Cleaver</td>
<td>Reciprocal Signaling Between Blood Vessels and Embryonic Tissues</td>
<td>Attie</td>
</tr>
<tr>
<td>4/23</td>
<td>Martin Gorovsky</td>
<td>RNAi – Mediated Genome Rearrangement in Tetrahymena</td>
<td>Kimble</td>
</tr>
<tr>
<td>4/30</td>
<td>Stephen Sturley</td>
<td>Unforeseen Pathways of Eukaryotic Lipid Transport and Metabolism; Novel Insights from Yeast</td>
<td>Attie</td>
</tr>
<tr>
<td>5/7</td>
<td>John Denu</td>
<td>Chemistry and Biology of Reversible Protein Acetylation</td>
<td>Kimble</td>
</tr>
<tr>
<td>5/14</td>
<td>Wenqing Xu</td>
<td>From β-catenin to PP2A: Structural and Mechanistic Studies of the Wnt Signaling Pathway</td>
<td>Kimble</td>
</tr>
</tbody>
</table>

Mondays at 3:30, Room B1118 Biochemistry
<table>
<thead>
<tr>
<th>Date</th>
<th>Speaker</th>
<th>Title</th>
<th>Host</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sep. 12</td>
<td>Michael Rosen</td>
<td>Regulation of Actin Assembly by WASP Family Proteins: From Angstroms to Microns</td>
<td>Markley</td>
</tr>
<tr>
<td>Sep. 19</td>
<td>Todd Yeates</td>
<td>The Structure and Function of Protein-Based Metabolic Organelles</td>
<td>Forest</td>
</tr>
<tr>
<td>Sep. 26</td>
<td>Bob Eisenberg</td>
<td>Ions in Channels</td>
<td>Mitchell</td>
</tr>
<tr>
<td>Oct. 10</td>
<td>Alfonso Mondragon</td>
<td>Type I DNA Topoisomerases</td>
<td>Butcher</td>
</tr>
<tr>
<td>Oct. 17</td>
<td>Russ Hille</td>
<td>The Structural Basis of Catalytic Power in Xanthine Oxidase</td>
<td>Phillips</td>
</tr>
<tr>
<td>Oct. 24</td>
<td>Wes Sundquist</td>
<td>The ESCRT Pathway in HIV Budding and Cell Division</td>
<td>Markley</td>
</tr>
<tr>
<td>Oct. 31</td>
<td>Marius Schmidt</td>
<td>Five-Dimensional Macromolecular Crystallography Location change! Room 1111 Biotechnology</td>
<td>Phillips</td>
</tr>
<tr>
<td>Nov. 7</td>
<td>James Chou</td>
<td>An NMR View of Membrane Transporters: Applications to Mitochondrial Carriers</td>
<td>Senes</td>
</tr>
<tr>
<td>Nov. 14</td>
<td>Chiwook Park</td>
<td>Mapping Transient Partial Unfolding in Proteins</td>
<td>Keck</td>
</tr>
<tr>
<td>Nov. 21</td>
<td>Natalie Strynadka</td>
<td>Structure Based Analysis of the Type III Secretion Apparatus in Pathogenic Bacteria</td>
<td>Forest</td>
</tr>
<tr>
<td>Nov. 28</td>
<td>Gianluigi Veglia</td>
<td>Structural Analysis of Calcium Regulation in Muscle by NMR Spectroscopy: from Understanding to Control</td>
<td>Senes</td>
</tr>
<tr>
<td>Dec. 5</td>
<td>Bil Clemons</td>
<td>Higher Order Assemblies in a Novel Membrane Protein Targeting Pathway</td>
<td>Weibel</td>
</tr>
<tr>
<td>Dec. 12</td>
<td>Jeffrey Kieft</td>
<td>Molecular Mimicry and Manipulation: How Structured Viral RNAs can Fool Ribosomes</td>
<td>Butcher</td>
</tr>
<tr>
<td>Date</td>
<td>Speaker</td>
<td>Title</td>
<td>Host</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Sep. 13</td>
<td>Anath Shalev</td>
<td>Beta Cell Survival and TXNIP Signaling</td>
<td>Attie</td>
</tr>
<tr>
<td>Sep. 20</td>
<td>Michael Brownlee</td>
<td>Hyperglycemic Memory in Arterial Endothelial Cells: Induction and Maintenance of Persistent Hyperglycemia-Induced Epigenetic Changes by Reactive Oxygen Species</td>
<td>Pagliarini</td>
</tr>
<tr>
<td>Sep. 27</td>
<td>Aki Ikeda</td>
<td>Synaptic Abnormality Associated with Aging and Neurodegeneration in the Retina</td>
<td>Ntambi</td>
</tr>
<tr>
<td>Oct. 4</td>
<td>Navdeep Chandel</td>
<td>Mitochondrial Complex III Regulates Signaling</td>
<td>Pagliarini</td>
</tr>
<tr>
<td>Oct. 11</td>
<td>David Bernlohr</td>
<td>Oxidative Stress and Mitochondrial Dysfunction in Type 2 Diabetes</td>
<td>Ntambi</td>
</tr>
<tr>
<td>Oct. 18</td>
<td>Marc Montminy</td>
<td>Control of Energy Balance by the CRTC Family of CREB Co-activators</td>
<td>Eisenstein</td>
</tr>
<tr>
<td>Oct. 25</td>
<td>Jonathan Weissman</td>
<td>TBA</td>
<td>Morgan</td>
</tr>
<tr>
<td>Nov. 1</td>
<td>Debbie Muoio</td>
<td>TBA Location change! Room 1111 Biotechnology</td>
<td>Attie</td>
</tr>
<tr>
<td>Nov. 8</td>
<td>Andrew Dillin</td>
<td>Using Aging Research to Probe New Areas of Biology</td>
<td>Pagliarini</td>
</tr>
<tr>
<td>Nov. 15</td>
<td>Dorothy Sears</td>
<td>Profiling Adipose Tissue Phenotypes in Obesity Models</td>
<td>Attie</td>
</tr>
<tr>
<td>Nov. 22</td>
<td>Feroz Papa</td>
<td>New Approaches to Measure and Reduce ER Stress</td>
<td>Attie</td>
</tr>
<tr>
<td>Nov. 29</td>
<td>Marc Van Gilst</td>
<td>TBA</td>
<td>Kimble</td>
</tr>
<tr>
<td>Dec. 6</td>
<td>Pere Puigserver</td>
<td>Nutrient Signaling to the SIRT1/PGC-1 Chromatin Complex: Implications for Metabolic Diseases</td>
<td>Denu</td>
</tr>
<tr>
<td>Dec. 13</td>
<td>Juleen Zierath</td>
<td>Gene and Environmental Factors Influencing Insulin Sensitivity</td>
<td>Attie</td>
</tr>
<tr>
<td>Date</td>
<td>Speaker</td>
<td>Title</td>
<td>Host</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Sept. 14</td>
<td>Donald Engelman</td>
<td>pH Dependent Insertion of a Transmembrane Helix: Senes Mechanism and Applications in Cancer and Drug Delivery</td>
<td>Senes</td>
</tr>
<tr>
<td>Sept. 21</td>
<td>Josep Rizo</td>
<td>Structural Insights into the Mechanism of Neurotransmitter Release</td>
<td>Fox</td>
</tr>
<tr>
<td>Sept. 28</td>
<td>John Bushweller</td>
<td>NMR Solution Structure and Function Studies of the Integral Membrane Enzyme DsbB</td>
<td>Markley</td>
</tr>
<tr>
<td>Oct. 5</td>
<td>Brian Crane</td>
<td>Structure and Reactivity of the Receptor: Kinase Array that Mediate Bacterial Chemotaxis</td>
<td>Weibel</td>
</tr>
<tr>
<td>Oct. 12</td>
<td>Brian Kobilka</td>
<td>Structural Insights into G Protein Coupled Receptor Activation</td>
<td>Martin</td>
</tr>
<tr>
<td>Oct. 19</td>
<td>William De Grado</td>
<td>TO BE RESCHEDULED</td>
<td>Fox</td>
</tr>
<tr>
<td>Oct. 26</td>
<td>Kerwyn Casey Huang</td>
<td>Curvature-mediated Localization of Cardiolipin in Bacteria</td>
<td>Weibel</td>
</tr>
<tr>
<td>Nov. 2</td>
<td>William Dowhan</td>
<td>How do Lipids Organize Membrane Proteins?</td>
<td>Weibel</td>
</tr>
<tr>
<td>Nov. 9</td>
<td>James U. Bowie</td>
<td>What Drives Membrane Protein Folding?</td>
<td>Fox</td>
</tr>
<tr>
<td>Nov. 16</td>
<td>Anne Kenworthy</td>
<td>Lipid Raft Organization and Dynamics in Cell Membranes</td>
<td>Martin</td>
</tr>
<tr>
<td>Nov. 23</td>
<td>Janet Wood</td>
<td>Concentration at the Cell Poles Modulates Osmoregulation by Osmosensory Transporter ProP in <em>Escherichia coli</em></td>
<td>Weibel</td>
</tr>
<tr>
<td>Nov. 30</td>
<td>Gunnar von Heijne</td>
<td>Proteins that cannot make up their mind: Dual-Topology and Anti-Parallel Membrane Proteins</td>
<td>Senes</td>
</tr>
<tr>
<td>Dec. 7</td>
<td>James Weisshaar</td>
<td>Imaging Proteins in Live <em>E. Coli</em> Under Osmotic Stress and Antimicrobial Attack</td>
<td>Weibel</td>
</tr>
<tr>
<td>Dec. 14</td>
<td>TBA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The 2009 series is supported by the Department Biochemistry, Chemistry Biology Interface Training Grant, and the Department of Biomolecular Chemistry.
<table>
<thead>
<tr>
<th>Date</th>
<th>Speaker</th>
<th>Title</th>
<th>Host</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept. 8</td>
<td>Chris Somerville</td>
<td>Development of Cellulosic Biofuels</td>
<td>Sussman</td>
</tr>
<tr>
<td></td>
<td>UC-Berkeley</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sept. 15</td>
<td>Mike Seibert</td>
<td>Algal Hydrogen Production-Physiology, Genomics and Process Development</td>
<td>Fox</td>
</tr>
<tr>
<td></td>
<td>National Renewable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Energy Laboratory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sept. 22</td>
<td>Robert Zubrin</td>
<td>Energy Victory: Winning the War on Terror by Breaking Free of Oil</td>
<td>Amasino</td>
</tr>
<tr>
<td></td>
<td>Pioneer Astronautics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sept. 29</td>
<td>James Liao</td>
<td>Metabolic Engineering for Synthesis of Higher-chain Alcohols as Biofuels</td>
<td>Pfleger</td>
</tr>
<tr>
<td></td>
<td>UCLA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oct. 6</td>
<td>Clint Chapple</td>
<td>Developing a Toolbox for the Modification of Plant Cell Wall Biosynthesis</td>
<td>Ralph</td>
</tr>
<tr>
<td></td>
<td>Purdue University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oct. 13</td>
<td>Jason Hill</td>
<td>Costs and Benefits of an Expanding Biofuels Industry</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td>U of Minnesota</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oct. 20</td>
<td>Alexander Steinbuechel</td>
<td>Biodiesel-like Fuels Produced by Biotechnology</td>
<td>Fox</td>
</tr>
<tr>
<td></td>
<td>Westfalisches Wilhelms-University of Munster, Germany</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oct. 27</td>
<td>Debra Mohnen</td>
<td>Plant Cell Wall Synthesis: the Challenge for Biofuel and Natural</td>
<td>TBA</td>
</tr>
<tr>
<td></td>
<td>U of Georgia</td>
<td>Product Production</td>
<td></td>
</tr>
<tr>
<td>Nov. 3</td>
<td>Alisha Jarnagin</td>
<td>Biomass to Ethanol: Spotlight on Enzymes</td>
<td>Sussman</td>
</tr>
<tr>
<td></td>
<td>Innovations Genencor, A Danisco Division</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov. 10</td>
<td>Thomas Binder</td>
<td>Diverse Energy Sources of Energy for the Future and Agricultures Role</td>
<td>Jackson</td>
</tr>
<tr>
<td></td>
<td>Archer Daniels Midland Research</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov. 17</td>
<td>Jay Keasling</td>
<td>Synthetic Biology for Synthetic Chemistry</td>
<td>Phillips</td>
</tr>
<tr>
<td></td>
<td>UC-Berkley</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov. 24</td>
<td>Roger Brent</td>
<td>TBA</td>
<td>Landick</td>
</tr>
<tr>
<td></td>
<td>Molecular Sciences Institute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec. 1</td>
<td>Tim Elgren</td>
<td>Harnessing the Power of an Enzyme: Catalytically Active Biomaterials</td>
<td>Fox</td>
</tr>
<tr>
<td></td>
<td>Hamilton College, NY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec. 8</td>
<td>John Ralph</td>
<td>Overcoming the “Lignin Problem” in Biomass Conversion</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>UW-Madison</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec. 15</td>
<td>Tim Donohue</td>
<td>Tapping the Genomes of Microbes for Biofuels Production</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>UW-Madison</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Speaker</td>
<td>Title</td>
<td>Host</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------</td>
<td>------------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>9/10</td>
<td>Toshio Tsukiyama</td>
<td>Global Roles of Chromatin Remodeling</td>
<td>C. Fox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fred Hutchinson Cancer Research Center</td>
<td></td>
</tr>
<tr>
<td>9/17</td>
<td>Carol Greider</td>
<td>Telomerase and the Consequences of Telomere Dysfunction</td>
<td>C. Fox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Johns Hopkins University</td>
<td></td>
</tr>
<tr>
<td>9/24</td>
<td>Jerry Workman</td>
<td>Protein Complexes that Modify Chromatin for Transcription</td>
<td>A. Ansari</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stowers Institute for Medical Research</td>
<td></td>
</tr>
<tr>
<td>10/1</td>
<td>Susan Wente</td>
<td>Regulation of Nucleocytoplasmic Transport</td>
<td>J. Kimble</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vanderbilt University</td>
<td></td>
</tr>
<tr>
<td>10/8</td>
<td>Robert Landick</td>
<td>Transcriptional Regulation via Allosteric Control of the</td>
<td>A. Ansari</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nucleotide Addition Cycle of RNA Polymerase</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UW Madison</td>
<td></td>
</tr>
<tr>
<td>10/15</td>
<td>Tom Misteli</td>
<td>The Surprising Role of Nuclear Architecture in Human Aging</td>
<td>A. Ansari</td>
</tr>
<tr>
<td></td>
<td></td>
<td>National Cancer Institute</td>
<td></td>
</tr>
<tr>
<td>10/22</td>
<td>Paul Kaufman</td>
<td>Histone Acetylation that Promotes Nucleosome Dynamics and</td>
<td>C. Fox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Genome Stability</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>University of Massachusetts</td>
<td></td>
</tr>
<tr>
<td>10/29</td>
<td>Steven McKnight</td>
<td>Curious Features of the Gene Encoding Neuronal PAS Domain</td>
<td>J. Kimble</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protein 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UT Southwestern</td>
<td></td>
</tr>
<tr>
<td>11/5</td>
<td>Bruce Stillman</td>
<td>Control of the Chromosome Cycle in Human Cells by the</td>
<td>C. Fox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Origin Recognition Complex</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cold Spring Laboratory</td>
<td></td>
</tr>
<tr>
<td>11/12</td>
<td>Linda Hsieh-Wilson</td>
<td>Roles for Protein Glycosylation in Transcription and</td>
<td>A. Ansari</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neuronal Signaling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Caltech</td>
<td></td>
</tr>
<tr>
<td>11/19</td>
<td>Jonathan Widom</td>
<td>The Genomic Code for Nucleosome Positioning</td>
<td>A. Ansari</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Northwestern</td>
<td></td>
</tr>
<tr>
<td>12/3</td>
<td>Matthew Michael</td>
<td>Biochemical Analysis of the DNA Replication Stress</td>
<td>C. Fox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stress Response</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Harvard</td>
<td></td>
</tr>
<tr>
<td>12/10</td>
<td>Marc Gartenberg</td>
<td>Heterochromatin and the Cohesion of Sister Chromatids</td>
<td>C. Fox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Robert Wood Johnson Medical School</td>
<td></td>
</tr>
</tbody>
</table>

3:30 p.m. in B1118 Biochemistry, 420 Henry Mall

2007 series is supported by UW Graduate School with income generated by patents filed through WARF, Lab of Genetics, Biomolecular Chemistry, Molecular Bioscience Training Grant, Biotechnology Training Program and Department Biochemistry
<table>
<thead>
<tr>
<th>Speaker Name</th>
<th>Institution</th>
<th>Talk Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheryl Arrowsmith</td>
<td>University of Toronto</td>
<td>Molecular Recognition by Readers of the Histone Code</td>
</tr>
<tr>
<td>Ad Bax</td>
<td>The National Institutes of Health</td>
<td>Motions of a Fusion Peptide in Lipid Bilayers from Size-Dispersed 15N NMR Relaxation</td>
</tr>
<tr>
<td>Tim Bugni</td>
<td>University of Wisconsin-Madison</td>
<td>Exploring the Secondary Metabolome of Marine Invertebrate Associated Bacteria</td>
</tr>
<tr>
<td>Sam Butcher</td>
<td>University of Wisconsin-Madison</td>
<td>Structural Biology of U6 Spliceosomal RNA</td>
</tr>
<tr>
<td>Silvia Cavagnero</td>
<td>University of Wisconsin-Madison</td>
<td>NMR Sensitivity Enhancement by Laser-driven Approaches</td>
</tr>
<tr>
<td>David Cowburn</td>
<td>Albert Einstein College of Medicine</td>
<td>Intrinsically Disordered Segments – What Can NMR Tell Us about Their Functions in Biology?</td>
</tr>
<tr>
<td>Hector DeLuca</td>
<td>University of Wisconsin-Madison</td>
<td>The Vitamin D System: A New NMR Mine</td>
</tr>
<tr>
<td>Art Edison</td>
<td>University of Florida</td>
<td>Nematode Chemical Ecology</td>
</tr>
<tr>
<td>Juli Feigon</td>
<td>University of California, Los Angeles</td>
<td>The Architecture of Human Telomerase RNA</td>
</tr>
<tr>
<td>Kevin Gardner</td>
<td>University of Texas Southwestern</td>
<td>Ligand-regulated Protein/Protein Interactions: Insights Provided by NMR into Nature’s Switches</td>
</tr>
<tr>
<td>Mark Girvin</td>
<td>Albert Einstein College of Medicine</td>
<td>Bicelles and Peptide-lipid Diskettes for Integral and Membrane Associated Proteins</td>
</tr>
<tr>
<td>Angela M. Gronenborn</td>
<td>University of Pittsburg School of Medicine</td>
<td>New Members of the CVNH Family and Other Anti-HIV Lectins</td>
</tr>
<tr>
<td>Katherine Henzler-Wildman</td>
<td>Washington University School of Medicine</td>
<td>Direct Observation of Conformational Exchange in the Small Multidrug Resistance Transporter, EmrE</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Topic</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Andrew Hinck</td>
<td>The University of Texas Health Science Center at San Antonio</td>
<td>Flexibility and Function in TGF-β Signal Transduction</td>
</tr>
<tr>
<td>Jeffrey C. Hoch</td>
<td>University of Connecticut Health Center</td>
<td>Maximum Entropy Reconstruction of Nonuniformly Sampled Multidimensional NMR Data</td>
</tr>
<tr>
<td>Charles Hoogstraten</td>
<td>Michigan State University</td>
<td>Dynamics and Function in Catalytic RNA</td>
</tr>
<tr>
<td>Mitsuhiro Ikura</td>
<td>University of Toronto</td>
<td>Probing Cancer Cell Signaling by NMR: Structure, Interaction, and Enzymatic Kinetics of Small GTPases</td>
</tr>
<tr>
<td>Oleg Jardetzky</td>
<td>Stanford University</td>
<td>Relaxation Theory and Protein Dynamics</td>
</tr>
<tr>
<td>Masatsune Kainosho</td>
<td>Tokyo Metropolitan University</td>
<td>Perspectives of SAIL-related Methods for Studying Structures and Dynamics of Larger Proteins</td>
</tr>
<tr>
<td>Robert Kaptein</td>
<td>Utrecht University</td>
<td>The Lac Repressor: Structure, Dynamics, and Allosteric Interactions</td>
</tr>
<tr>
<td>Slobodan Macura</td>
<td>Mayo Foundation</td>
<td>Study of 18O/16O Isotope Labeling Networks in Metabolic Oligo-phosphates by J-decoupled 31P NMR Chemical Shift Correlation Spectroscopy</td>
</tr>
<tr>
<td>Gaetano Montelione</td>
<td>Rutgers University</td>
<td>The Influenza Non-Structural Protein 1. Biological Insights from Structural Studies</td>
</tr>
<tr>
<td>James Prestegard</td>
<td>University of Georgia</td>
<td>Combining NMR with Other Technologies: Chemokine Aggregation and GAG Interaction</td>
</tr>
<tr>
<td>Michael Reily</td>
<td>Bristol-Myers Squibb</td>
<td>Putting Metabolomics to Practice in Pharmaceutical R&amp;D</td>
</tr>
<tr>
<td>Gordon Roberts</td>
<td>University of Leicester</td>
<td>A Tale of Talin - Multiple Domains with Different Functions from the Same Fold</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Topic</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Heinz Ruterjans</td>
<td>University of Frankfurt</td>
<td>45 Years of Biological NMR</td>
</tr>
<tr>
<td>Richard Vierstra</td>
<td>University of Wisconsin-Madison</td>
<td>Atomic Perspectives on Phytochrome Photoactivation and Signaling</td>
</tr>
<tr>
<td>Brian Volkman</td>
<td>Medical College of Wisconsin</td>
<td>Access to the Unfolded State as a Functional Necessity in Intrinsically Folded Proteins</td>
</tr>
<tr>
<td>Gerhard Wagner</td>
<td>Harvard University</td>
<td>Recent Development of NMR Experiments for Challenging Proteins</td>
</tr>
<tr>
<td>Speaker</td>
<td>Institution</td>
<td>Talk Title</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Alan D. Attie</td>
<td>University of Wisconsin-Madison</td>
<td>Gene Loci for Type 2 Diabetes in Mice</td>
</tr>
<tr>
<td>David A. Bernlohr</td>
<td>University of Minnesota</td>
<td>Inflammation and Macrophage Leukotriene Synthesis</td>
</tr>
<tr>
<td>Sudha Biddinger</td>
<td>Children’s Hospital of Boston</td>
<td>The Control of Lipid Metabolism in Insulin Resistant States</td>
</tr>
<tr>
<td>Dawn L. Brasaemle</td>
<td>Rutgers University</td>
<td>Perilipin Control of Lipolysis</td>
</tr>
<tr>
<td>Xiaoli Chen</td>
<td>University of Minnesota</td>
<td>Lipocalin 2 as an Important Regulator of Energy Metabolism</td>
</tr>
<tr>
<td>Rosalind A. Coleman</td>
<td>University of North Carolina</td>
<td>Lipid Metabolism: Location, Location, Location</td>
</tr>
<tr>
<td>Michael P. Czech</td>
<td>University of Massachusetts</td>
<td>Metabolic Control by Lipid Droplet Proteins</td>
</tr>
<tr>
<td>Richard J. Deckelbaum</td>
<td>Columbia University</td>
<td>Omega-3 Fatty Acids: Preventive and Therapeutic Molecules for Liver, Heart, and Brain</td>
</tr>
<tr>
<td>Agnieszka Dobrzyn</td>
<td>Nencki Institute of Experimental Biology, Warsaw, Poland</td>
<td>Unsaturated Fatty Acids and Regulation of Cardia Energy Metabolism</td>
</tr>
<tr>
<td>Robert H. Eckel</td>
<td>University of Colorado, Denver</td>
<td>Lipoprotein Lipase in the Brain Regulates Energy Balance and Body Weight</td>
</tr>
<tr>
<td>Christopher Glass</td>
<td>University of California, San Diego</td>
<td>Sterol/Oxysterol Regulation of Macrophage Gene Expression</td>
</tr>
<tr>
<td>Ira J. Goldberg</td>
<td>Columbia University</td>
<td>Correcting Cardiac Lipotoxicity</td>
</tr>
<tr>
<td>Frank J. Gonzalez</td>
<td>National Cancer Institute, Bethesda</td>
<td>Investigating the Roles of Lipids in Disease and Chemical Toxicities using Metabolomics</td>
</tr>
<tr>
<td>Daniel S. Greenspan</td>
<td>University of Wisconsin-Madison</td>
<td>α3(V) Collagen Ablation in Mice Induces Diabetes-related Symptoms via Effects on Pancreatic Islets and Peripheral Tissues</td>
</tr>
<tr>
<td>Jay D. Horton</td>
<td>University of Texas</td>
<td>Molecular Mediators of</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Topic</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Barbara B. Kahn</td>
<td>Harvard University</td>
<td>Adipose ChREBP, Lipogenesis, and Insulin Sensitivity</td>
</tr>
<tr>
<td>C. Ronald Kahn</td>
<td>Harvard University</td>
<td>Insulin, Diabetes and the Control of Brain Cholesterol Metabolism</td>
</tr>
<tr>
<td>Ronald M. Krauss</td>
<td>Children’s Hospital Oakland Research Institute</td>
<td>Blood Livers and Body Fat – Making the Connection</td>
</tr>
<tr>
<td>M. Daniel Lane</td>
<td>Johns Hopkins School of Medicine</td>
<td>How Glucose and Fructose Alter Hypothalamic Signaling and Feeding Behavior</td>
</tr>
<tr>
<td>Chih-Hao Lee</td>
<td>Harvard University</td>
<td>Metabolic Regulation by Immune Signaling</td>
</tr>
<tr>
<td>Aldons J. Lusis</td>
<td>University of California, Los Angeles</td>
<td>Systems Genetics Approaches to Complex Cardiovascular Traits</td>
</tr>
<tr>
<td>Ormond A. MacDougald</td>
<td>University of Michigan Medical School</td>
<td>Role of Wnt Signaling in Adipocyte Signaling and Lipid Metabolism</td>
</tr>
<tr>
<td>Susanne Mandrup</td>
<td>University of Southern Denmark</td>
<td>Transcriptional Networks of Fat Cell Development</td>
</tr>
<tr>
<td>Makoto Miyazaki</td>
<td>University of Colorado, Denver</td>
<td>Bile Acid Signaling in Regulation of Atherosclerosis and Vascular Calcification</td>
</tr>
<tr>
<td>Deborah M. Muoio</td>
<td>Duke University</td>
<td>Mitochondrial Stress and Metabolic Dysfunction in Skeletal Muscle</td>
</tr>
<tr>
<td>Christopher B. Newgard</td>
<td>Duke University</td>
<td>Metabolomics Used for Understanding Chronic Disease Mechanisms</td>
</tr>
<tr>
<td>James M. Ntambi</td>
<td>University of Wisconsin-Madison</td>
<td>A Role for Skin Stearoyl-CoA Desaturase-1 in Obesity and Diabetes</td>
</tr>
<tr>
<td>Apostolos Pappas</td>
<td>Johnson &amp; Johnson Skillman, New Jersey</td>
<td>Lipids in Skin Physiology, Health and Disease</td>
</tr>
<tr>
<td>Pere Puigserver</td>
<td>Harvard University</td>
<td>A Nutrient Sensor Mechanism for Control of Lipid Oxidation</td>
</tr>
<tr>
<td>Joyce J. Repa</td>
<td>University of Texas Southwestern Medical Center</td>
<td>Lipid-sensing Transcription Factors and Beta-cell Biology</td>
</tr>
<tr>
<td>Karen Reue</td>
<td>University of California, Los Angeles</td>
<td>Deciphering the Roles of Lipin Family Members in Tissue Lipid Homeostasis</td>
</tr>
<tr>
<td>Philipp E. Scherer</td>
<td>University of Texas Southwestern Medical Center</td>
<td>Multiple Effects of Xbp1s on Hepatic Lipid Metabolism</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Topic</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hei Sook Sul</td>
<td>University of California, Berkeley</td>
<td>Regulation and Function of Adipose Lipolysis</td>
</tr>
<tr>
<td>Alan Tall</td>
<td>Columbia University</td>
<td>ABC Transporters and ApoE in the Regulation of Hematopoietic Stem Cell Proliferation, Monocytosis and Atherogenesis</td>
</tr>
<tr>
<td>Peter Tontonoz</td>
<td>University of California, Los Angeles</td>
<td>Control of Cholesterol Homeostasis by LXRs</td>
</tr>
<tr>
<td>Dennis E. Vance</td>
<td>University of Alberta</td>
<td>Phospholipid Methylation, Diabetes and Obesity</td>
</tr>
<tr>
<td>C.-L. Eric Yen</td>
<td>University of Wisconsin-Madison</td>
<td>Intestinal Triacylglycerol Metabolism and Energy Balance</td>
</tr>
</tbody>
</table>
Synthetic Genes to Synthetic Life
On the Exploration and Synthesis of Biological Systems
33rd STEENBOCK SYMPOSIUM
In honor of GOBIND KHORANA

July 30th - August 2nd 2009
University of Wisconsin–Madison

Organizers:
Aseem Z Ansari
Uttam RajBhandary

DNA/RNA Biology
Genes & Regulation
Signaling & Cancer
Chemical Biology

Protein Synthesis
Cell Surfaces
Genomics
Synthetic Biology

Rewiring Networks
Systems Biology & Medicine
Nano-devices/Biomachines
Artificial Life & Ethics

http://steenbock33.biochem.wisc.edu
<table>
<thead>
<tr>
<th>Speaker</th>
<th>Institution</th>
<th>Talk Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sankar Adhya</td>
<td>National Cancer Institute</td>
<td>The Puzzle of Prophage λ Stability</td>
</tr>
<tr>
<td>Julius Adler</td>
<td>University of Wisconsin-Madison</td>
<td>Gobind Khorana and My Current Research on Drosophila Behavior</td>
</tr>
<tr>
<td>Alan Attie</td>
<td>University of Wisconsin-Madison</td>
<td>Gene Networks and Type 2 Diabetes</td>
</tr>
<tr>
<td>Peter Besmer</td>
<td>Memorial Sloan-Kettering Cancer Center</td>
<td>Oncogenic Kit Receptor Signaling and Targeted Molecular Therapies – in Mouse Models of Gastrointestinal Stromal Tumor</td>
</tr>
<tr>
<td>Fredrick Blattner</td>
<td>University of Wisconsin-Madison</td>
<td>Reducing the genome of E. coli: a top down approach to synthetic biology</td>
</tr>
<tr>
<td>James Bradner</td>
<td>Dana-Farber Cancer Institute</td>
<td>Direct Inhibition of the Notch Transactivation Complex</td>
</tr>
<tr>
<td>Ronald Breaker</td>
<td>Yale University</td>
<td>Large Structured Non-coding RNAs Revealed by Bacterial Metagenome Analysis</td>
</tr>
<tr>
<td>Patrick Brown</td>
<td>Stanford University</td>
<td>The &quot;Dark Matter&quot; of Biological Regulation?</td>
</tr>
<tr>
<td>Marvin Caruthers</td>
<td>University of Colorado, Boulder</td>
<td>Nucleic Acid Chemistry: From Gobind to the Present</td>
</tr>
<tr>
<td>Simon Chang</td>
<td>Louisiana State University</td>
<td>The First Crystallographic Structure of Mammalian Phosphofructokinase from Rabbit Skeletal Muscle</td>
</tr>
<tr>
<td>Alta Charo</td>
<td>University of Wisconsin-Madison</td>
<td>Synthetic Biology in Ethical Perspective</td>
</tr>
<tr>
<td>George Church</td>
<td>Harvard University Medical School</td>
<td>Reading and Writing Genomes</td>
</tr>
<tr>
<td>James Dahlberg</td>
<td>University of Wisconsin-Madison</td>
<td>Dissecting the roles of X. laevis miRNAs and Ago proteins in RISC activity</td>
</tr>
<tr>
<td>Peter Dervan</td>
<td>California Institute of Technology</td>
<td>Transcription Factors as Targets for Cancer Therapy</td>
</tr>
<tr>
<td>David Farrens</td>
<td>Oregon Health &amp; Science University</td>
<td>Dynamics of G-Protein Coupled Receptor (GPCR) Activation and Attenuation:</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Topic</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hans-Joachim Fritz</td>
<td>Georg-August-Universität Göttingen</td>
<td>Insights from Fluorescence Studies</td>
</tr>
<tr>
<td>Audrey Gasch</td>
<td>University of Wisconsin-Madison</td>
<td>The Hopeful Cornucopia - A study into Combinatorial Gene Synthesis</td>
</tr>
<tr>
<td>Marie-Alda Gilles-Gonzalez</td>
<td>University of Texas Southwestern</td>
<td>Acquired Stress Resistance in Yeast: Multiple Means to the Same End</td>
</tr>
<tr>
<td>Hikoya Hayatsu</td>
<td>Okayama University</td>
<td>Oxygen Control of Cyclic di-GMP Homeostasis</td>
</tr>
<tr>
<td>Lee Hood</td>
<td>Institute for Systems Biology</td>
<td>Bisulfite Modification of Nucleotides: Mechanistic Consideration leading to improved Protocols of DNA Methylation Analysis</td>
</tr>
<tr>
<td>Wayne Hubbell</td>
<td>University of California, Los Angeles</td>
<td>Systems Biology, Transforming Technologies and the Emergence of P4 Medicine (Predictive, Personalized, Preventive and Participatory)</td>
</tr>
<tr>
<td>John Hwa</td>
<td>Dartmouth College</td>
<td>Gobind Khorana and the “Central Dogma” of Receptor Activation</td>
</tr>
<tr>
<td>Jay Keasling</td>
<td>University of California, Berkeley</td>
<td>Pharmacogenetics of the Human Prostacyclin Receptor: “hIP, SNiP COX and Vioxx”</td>
</tr>
<tr>
<td>Ryan Kershner</td>
<td>University of Wisconsin-Madison</td>
<td>Synthetic Biology for Synthetic Fuels</td>
</tr>
<tr>
<td>Laura Kiessling</td>
<td>University of Wisconsin-Madison</td>
<td>Top Down Meets Bottom Up: Controlled Placement of DNA Nanostructures</td>
</tr>
<tr>
<td>Peter Kim</td>
<td>Merck</td>
<td>Chemical Probes of Receptor Assembly in Signaling</td>
</tr>
<tr>
<td>Judith Klein-Seetharaman</td>
<td>University of Pittsburgh</td>
<td>Viral Membrane Fusion and its Inhibition</td>
</tr>
<tr>
<td>Robert Landick</td>
<td>University of Wisconsin-Madison</td>
<td>Learning from Rhodopsin about Metabotropic Glutamate Receptors</td>
</tr>
<tr>
<td>Henry Lardy</td>
<td>University of Wisconsin-Madison</td>
<td>Genome-scale Chromosomal Engineering of Bacterial Hosts for Bioenergy Production</td>
</tr>
<tr>
<td>Michael Levine</td>
<td>University of California, Berkeley</td>
<td>The Metabolism and Function of Dehydroepiandrosterone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transcriptional Precision in the Drosophila Embryo</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Title</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Wendell Lim</td>
<td>University of California, San Francisco</td>
<td>Biological Innovation: The Evolution and Engineering of New Signaling Systems</td>
</tr>
<tr>
<td>Marshall Nirenberg</td>
<td>The National Institutes of Health</td>
<td>Deciphering the Genetic Code</td>
</tr>
<tr>
<td>Li Niu</td>
<td>University at Albany</td>
<td>One RNA Aptamer Sequence, Two Structures: A Collaborating Pair that Competitively Inhibits AMPA Receptors</td>
</tr>
<tr>
<td>Eiko Ohtsuka</td>
<td>National Institute of Advanced Industrial Science and Technology</td>
<td>Efficient Synthesis of Oligonucleotide Conjugates on Solid-Support Using an (Aminoethoxycarbonyl) aminohexyl Group for 5’-Terminal Modification</td>
</tr>
<tr>
<td>Rob Phillips</td>
<td>California Institute of Technology</td>
<td>The Physics of Genome Management</td>
</tr>
<tr>
<td>Mark Ptashne</td>
<td>Memorial Sloan-Kettering Cancer Center</td>
<td>Binding Reactions: Epigenetic Switches, Signal Transduction, Evolution and Cancer</td>
</tr>
<tr>
<td>Kevin Ridge</td>
<td>University of Texas</td>
<td>Signaling via Structure Change: NMR Analysis of GPCR and G protein Activation</td>
</tr>
<tr>
<td>Marsha Rosner</td>
<td>University of Chicago</td>
<td>Regulation of Tumor Metastasis by MAP Kinase and MicroRNAs</td>
</tr>
<tr>
<td>Thomas Sakmar</td>
<td>The Rockefeller University</td>
<td>Heptahelical Receptors: Ligand Recognition and Conformational Dynamics in Bilayers</td>
</tr>
<tr>
<td>Nadrian Seeman</td>
<td>New York University</td>
<td>DNA: Not Merely the Secret of Life</td>
</tr>
<tr>
<td>Phillip Sharp</td>
<td>Massachusetts Institute of Technology</td>
<td>RNA as a Gene Regulation Modality</td>
</tr>
<tr>
<td>William Shih</td>
<td>Harvard University Medical School</td>
<td>Programmable Self-assembly of DNA into Nanoscale Three-dimensional Shapes</td>
</tr>
<tr>
<td>Hamilton Smith</td>
<td>J. Craig Venter Institute</td>
<td>Making a Synthetic Cell</td>
</tr>
<tr>
<td>Dieter Söll</td>
<td>Yale University</td>
<td>The Genetic Code Revisited – Four Decades after Francis Crick</td>
</tr>
<tr>
<td>James Thomson</td>
<td>University of Wisconsin-Madison</td>
<td>Human Induced Pluripotent Stem Cells Derived with</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Topic</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------------------</td>
<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>Robert Wells</td>
<td>Texas A&amp;M University</td>
<td>Non-B DNA Conformations, Mutagenesis and Disease</td>
</tr>
<tr>
<td>George Whitesides</td>
<td>Harvard University</td>
<td>Questions about Questions about the Origin of Life</td>
</tr>
<tr>
<td>Richard Young</td>
<td>Whitehead Institute for Biomedical Research &amp;</td>
<td>Programming Cell State</td>
</tr>
<tr>
<td></td>
<td>Massachusetts Institute of Technology</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dynamics of Proteins and Macromolecular Assemblies

May 18-21, 2006

Organizers:
George N. Phillips, Jr.  University of Wisconsin – Madison
Julie Mitchell  University of Wisconsin – Madison
Qiang Cui  University of Wisconsin – Madison
Robert Jernigan  Iowa State University

http://www.biochem.wisc.edu/steenbock/symposium32
### 32nd Steenbock Symposium (2006)
Dynamics of Proteins and Macromolecular Assemblies
Organizers: George N. Phillips, Jr., Julie Mitchell, Qiang Cui, and Robert Jernigan

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Institute</th>
<th>Talk Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ioan Andricioaei</td>
<td>University of Michigan, Ann Arbor</td>
<td>Human Topoisomerase I Relaxes Positive and Negative DNA Supercoils Differently</td>
</tr>
<tr>
<td>Ivet Bahar</td>
<td>University of Pittsburgh</td>
<td>Common Mechanism of Pore Opening Shared by Five Potassium Channels Elucidated by Gaussian Network Model</td>
</tr>
<tr>
<td>Bernie Brooks</td>
<td>The National Institutes of Health</td>
<td>Probing Macromolecular Motions and Couplings Using Elastic Network Models</td>
</tr>
<tr>
<td>Charles Brooks</td>
<td>The Scripps Research Institute</td>
<td>Viral Capsid Dynamics: From Maturation to Assembly</td>
</tr>
<tr>
<td>Rafal Bruschweiler</td>
<td>Florida State University</td>
<td>Computationally Enhanced Dynamics Analysis of Protein NMR Data</td>
</tr>
<tr>
<td>Robert G. Bryant</td>
<td>University of Virginia</td>
<td>Dynamics in Proteins from 10 kHz to GHz</td>
</tr>
<tr>
<td>Michael Feig</td>
<td>Michigan State University</td>
<td>Normal-Mode Based Sampling of Pathways from Comparative Protein Models to the Native State</td>
</tr>
<tr>
<td>Karl Freed</td>
<td>University of Chicago</td>
<td>Minimalist Representations and the Importance of Nearest Neighbor Effects in Protein Folding Simulations</td>
</tr>
<tr>
<td>Dmitry Kondrashov</td>
<td>University of Wisconsin-Madison</td>
<td>Optimization, Validation, and Application of Coarse-Grained Models of Residue Interaction</td>
</tr>
<tr>
<td>Krzysztof Kuczera</td>
<td>University of Kansas</td>
<td>Hinge-bending motion in S-adenosyl-L-homocysteine hydrolase: mutagenesis, fluorescence and modeling studies</td>
</tr>
<tr>
<td>Maria Kurnikova</td>
<td>Carnegie Mellon University</td>
<td>Hierarchical Approach to Coarse-Grain Modeling of Protein Structures which Accounts for Fast Local Fluctuations</td>
</tr>
<tr>
<td>Andrew Lee</td>
<td>University of North Carolina</td>
<td>Dynamic Coupling and Allosteric Behavior in a Non-</td>
</tr>
<tr>
<td>Authors</td>
<td>Affiliation</td>
<td>Title</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Jianpeng Ma</td>
<td>Baylor College of Medicine</td>
<td>Allosteric Protein: New Methods for Coarse-grained Normal Mode Analysis and Their Applications in Structural Refinement</td>
</tr>
<tr>
<td>Paul Maragakis</td>
<td>Harvard University</td>
<td>Plastic Network Model of Large Amplitude Conformational Change</td>
</tr>
<tr>
<td>Kevin Plaxco</td>
<td>University of California, Santa Barbara</td>
<td>Terahertz Absorption Spectroscopy: A New Experimental Probe of Collective Vibrational Motions in Solvated Proteins</td>
</tr>
<tr>
<td>Carol B. Post</td>
<td>Purdue University</td>
<td>Src kinase activation: A switched electrostatic network</td>
</tr>
<tr>
<td>Jeff Skolnick</td>
<td>Georgia Institute of Technology</td>
<td>Prediction of Protein Structure, Function and Druggability on a Proteomic Scale</td>
</tr>
<tr>
<td>Sean Sun</td>
<td>Johns Hopkins University</td>
<td>Elasticity and Coarse-grained Models of Protein Secondary Structures</td>
</tr>
<tr>
<td>Florence Tama</td>
<td>University of Arizona</td>
<td>Multi-Scale Modeling from Multi-Resolution Data: Unveiling Functional Motions of Macromolecular Machines</td>
</tr>
<tr>
<td>Michael Thorpe</td>
<td>Arizona State University, Tempe</td>
<td>Flexibility, Rigidity and Coarse Graining in Biomolecules</td>
</tr>
<tr>
<td>Arjan van der Vaart</td>
<td>Harvard University</td>
<td>The Unfolding Action of GroEL on a Protein Substrate</td>
</tr>
<tr>
<td>Jin Wang</td>
<td>The State University of New York, Stony Brook</td>
<td>Single Molecule Dynamics Reveals the Role of Flexibility in Bio-molecular Recognition</td>
</tr>
<tr>
<td>Tom Woolf</td>
<td>Johns Hopkins University</td>
<td>Membrane Fusion: Molecular insights from all-atom and coarse-grained simulations</td>
</tr>
<tr>
<td>Xiao Zhu</td>
<td>University of Wisconsin-Madison</td>
<td>Beta-peptide: From Structure To Phase Behavior</td>
</tr>
</tbody>
</table>
31st Steenbock Symposium

Fe-S Proteins:
Biogenesis
Structure
Function

May 19 – 22, 2005

an ASBMB sponsored symposium
Department of Biochemistry,
University of Wisconsin, Madison, WI 53706
### 31st Steenbock Symposium (2005)
Fe-S Proteins: Biogenesis, Structure and Function
Organizers: Elizabeth Craig, Helmut Beinert, Patricia Kiley, and Richard Eisenstein

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Institution</th>
<th>Talk Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simon Albracht</td>
<td>University of Amsterdam</td>
<td>The H cluster: A Light-Sensitive 6Fe Active Site in [Fe-Fe]-Hydrogenases</td>
</tr>
<tr>
<td>Squire Booker</td>
<td>Pennsylvania State University</td>
<td>Biosynthesis of the Lipoyl Cofactor. Understanding Sulfur Insertion into Unactivated Alkanes</td>
</tr>
<tr>
<td>Francesco Bonomi</td>
<td>University of Milan</td>
<td>Multiple Turnover 2Fe-2S Cluster Transfer Activity of IscA and IscU</td>
</tr>
<tr>
<td>Joan Broderick</td>
<td>Michigan State University</td>
<td>Iron-Sulfur Clusters in AdoMet-mediated Radical Chemistry</td>
</tr>
<tr>
<td>Andrew Dancis</td>
<td>University of Pennsylvania</td>
<td>Frataxin, iron, and oxygen</td>
</tr>
<tr>
<td>Sheila David</td>
<td>University of Utah</td>
<td>Roles for 4Fe-4S Clusters in the Repair of Damaged DNA Bases</td>
</tr>
<tr>
<td>Dennis Dean</td>
<td>Virginia Polytechnic Institute and State University</td>
<td>Biochemical-genetic analysis of Fe-S cluster biosynthesis in Azotobacter vinelandii</td>
</tr>
<tr>
<td>Kathryn Deck</td>
<td>University of Wisconsin-Madison</td>
<td>Enhanced NO Sensitivity of the Fe-S Cluster inPhosphomimetic Mutants of IRP1/c-aconitase</td>
</tr>
<tr>
<td>Huangen Ding</td>
<td>Louisiana State University</td>
<td>Iron Binding in IscA and Iron Delivery for the Biogenesis of Iron-Sulfur Clusters</td>
</tr>
<tr>
<td>Catherine Drennan</td>
<td>Massachusetts Institute of Technology</td>
<td>The Anatomy of AdoMet Radical Enzymes</td>
</tr>
<tr>
<td>Jennifer Giel</td>
<td>University of Wisconsin-Madison</td>
<td>Characterizing the Invisible: EPR and ENDOR Studies of Intermediates in N2 Reduction by Nitrogenase</td>
</tr>
<tr>
<td>Brian Hoffman</td>
<td>Northwestern University</td>
<td>Chemical Approaches to Complex Heterometal Sites in Biology</td>
</tr>
<tr>
<td>Richard Holm</td>
<td>Harvard University</td>
<td>Iron-sulfur clusters confer vulnerability to oxidative</td>
</tr>
<tr>
<td>James Imlay</td>
<td>University of Illinois</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Affiliation</td>
<td>Topic</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Joseph Jarret</td>
<td>University of Pennsylvania</td>
<td>A Role for Iron-Sulfur Cluster Assembly and Repair in Biotin Biosynthesis</td>
</tr>
<tr>
<td>Michael Johnson</td>
<td>University of Georgia</td>
<td>Site-specific reactivity of [4Fe-4S] clusters in disulfide reductases and radical SAM enzymes</td>
</tr>
<tr>
<td>Peter Kroneck</td>
<td>Fachbereich Biologie Universität Konstanz</td>
<td>Living on Sulfur: 3D Architecture and Spectroscopy of the Iron-Sulfur Enzymes APS Reductase and Dissimilatory Sulfite Reductase</td>
</tr>
<tr>
<td>Roland Lill</td>
<td>Philipps-Universität Marburg</td>
<td>Biogenesis of iron-sulfur proteins in mitochondria and cytosol of eukaryotes</td>
</tr>
<tr>
<td>Jaroslaw Marszalek</td>
<td>University of Gdańsk</td>
<td>From Madison to Grenoble and Back: riding Ferredoxins through Iron-Sulfur Territory</td>
</tr>
<tr>
<td>Jacques Meyer</td>
<td>Université de Grenoble</td>
<td>The First Fe-S Cluster-Bound Crystal Structure of a Scaffold Protein</td>
</tr>
<tr>
<td>Masato Nakai</td>
<td>Osaka University</td>
<td>The SUF machinery in the iron-sulfur cluster biosynthesis</td>
</tr>
<tr>
<td>Sandrine Ollagnier-de Choudens</td>
<td>Université de Grenoble</td>
<td>The SUF machinery in the iron-sulfur cluster biosynthesis</td>
</tr>
<tr>
<td>Wayne Outten</td>
<td>University of South Carolina</td>
<td>Iron Homeostasis Under Stress: Fe-S Cluster Biosynthesis and the suf Pathway in E. coli</td>
</tr>
<tr>
<td>John Peters</td>
<td>Montana State University</td>
<td>Hydrogenase Structure, Function, and Expression</td>
</tr>
<tr>
<td>Marinus Pilon</td>
<td>Colorado State University</td>
<td>Analysis of Fe-S Cluster Formation in Plant Chloroplasts</td>
</tr>
<tr>
<td>Hélène Puccio</td>
<td>Instutut de Génétique et Biologie Moléculaire et Cellulaire</td>
<td>Mouse and Cellular Models for Friedreich Ataxia: Consequences of Frataxin Deficiency</td>
</tr>
<tr>
<td>Beatrice Py</td>
<td>UPR-CNRS</td>
<td>Analysis of the Heteromeric CsdA-CsdE Cysteine Desulfurase, Assisting Fe-S</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Topic</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Tracey Rouault</td>
<td>The National Institutes of Health</td>
<td>Biogenesis in Escherichia coli</td>
</tr>
<tr>
<td>Yasuhiro Takahashi</td>
<td>Osaka University</td>
<td>Mammalian iron-sulfur biogenesis in mitochondria and cytosol</td>
</tr>
<tr>
<td>Larry Vickery</td>
<td>University of California, Irvine</td>
<td>Comparative Genetic Analysis of the Three Distinct Systems Involved in the Assembly of Fe-S Clusters</td>
</tr>
<tr>
<td>Anne Volbeda</td>
<td>Institut de Biologie Structurale Grenoble</td>
<td>The roles of chaperones HscA and HscB in Fe-S protein biogenesis</td>
</tr>
<tr>
<td>William Walden</td>
<td>University of Illinois at Chicago</td>
<td>Cfd1p: A Cytosolic FeS Cluster Assembly Factor</td>
</tr>
<tr>
<td>Speaker</td>
<td>Institution</td>
<td>Talk Title</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Wayne Barnes</td>
<td>Washington University</td>
<td>Hot Start, Fidelity and Cloning Improvements for PCR</td>
</tr>
<tr>
<td>Mike Chandler</td>
<td>Institut d’Exploration Fonctionelle des Génomes – France</td>
<td>Emerging Perspectives on the Transfer of Antibiotic Resistance</td>
</tr>
<tr>
<td>Nancy Craig</td>
<td>Johns Hopkins University</td>
<td>Bug Transposons</td>
</tr>
<tr>
<td>Julian Davies</td>
<td>University of British Columbia</td>
<td>Antibiotics, Gene Expression, and the Meaning of Life</td>
</tr>
<tr>
<td>Jeffrey Gardner</td>
<td>University of Illinois</td>
<td>Emerging Perspectives on the Transfer of Antibiotic Resistances</td>
</tr>
<tr>
<td>Carol Gross</td>
<td>University of California, San Francisco</td>
<td>Stress Signaling Pathways</td>
</tr>
<tr>
<td>David Haniford</td>
<td>University of Western Ontario</td>
<td>Target Site Selection in Tn10 Transposition</td>
</tr>
<tr>
<td>Daria Hazuda</td>
<td>Merck</td>
<td>Pyrophosphate mimetics: a mechanism based approach to antiviral drug discovery</td>
</tr>
<tr>
<td>Wolfgang Hillen</td>
<td>Institute for Microbiology - France</td>
<td>Gene regulation by tetracyclines: Mechanisms and applications</td>
</tr>
<tr>
<td>Alik Honigman</td>
<td>The Hebrew University – Israel</td>
<td>CREB Hypoxia and Cancer</td>
</tr>
<tr>
<td>Lianna Johnson</td>
<td>University of California, Los Angeles</td>
<td>Gene silencing in Arabidopsis</td>
</tr>
<tr>
<td>Reid Johnson</td>
<td>University of California, Los Angeles</td>
<td>Architecture of the Hin synaptic complex before and after DNA exchange</td>
</tr>
<tr>
<td>Chinghai Kao</td>
<td>University of Indiana School of Medicine</td>
<td>HoxB-13 in prostate and colorectal cancer development</td>
</tr>
<tr>
<td>Anna Glasgow Karls</td>
<td>University of Georgia</td>
<td>Site-specific recombination and transposition mediated by the novel Piv/MooV DNA recombinases</td>
</tr>
<tr>
<td>Russell Karls</td>
<td>University of Georgia</td>
<td>A possible role for sigma factor C in Mycobacterium tuberculosis latency</td>
</tr>
<tr>
<td>Mark Krebs</td>
<td>Illinois State University</td>
<td>Bacteriorhodopsin Biogenesis: from Polypeptide to Membrane Crystal</td>
</tr>
<tr>
<td>Vladislav Lanzov</td>
<td>Russian Academy of Sciences</td>
<td>Molecular basis and biological</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Topic</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Lynne Maquat</td>
<td>University of Rochester</td>
<td>reasons of hyper-recombinogenic activity of Pseudomonas aeruginosa RecA protein</td>
</tr>
<tr>
<td>John Marko</td>
<td>University of Illinois</td>
<td>Nonsense-mediated mRNA decay in mammalian cells: Splicing-dependent degradation that occurs 5'-to-3' and 3'-to-5' as a consequence of a &quot;pioneer&quot; round of translation</td>
</tr>
<tr>
<td>Patrice Nordmann</td>
<td>Hospital de Bicetre – France</td>
<td>Micromechanical study of proteins interacting with single DNA molecules</td>
</tr>
<tr>
<td>Martha Peterson</td>
<td>University of Kentucky</td>
<td>Genetics as a source of emerging resistance to antibiotics</td>
</tr>
<tr>
<td>Kathleen Postle</td>
<td>Washington State University</td>
<td>RNA Processing Regulation of Immunoglobulin Gene Expression</td>
</tr>
<tr>
<td>William Reznikoff</td>
<td>University of Wisconsin-Madison</td>
<td>Shuttleing between Membranes, a New Energy Transduction Paradigm in Gram Negative Bacteria</td>
</tr>
<tr>
<td>Steven Rothstein</td>
<td>University of Guelph</td>
<td>Tn5 transposase as a surrogate for HIV-1 integrase in drug screens</td>
</tr>
<tr>
<td>Anna Marie Skalka</td>
<td>Fox Chase Cancer Center</td>
<td>Is there a role for Genomics in Crop Improvement?</td>
</tr>
<tr>
<td>Sally Twining</td>
<td>Medical College of Wisconsin</td>
<td>Role of the reactive site loop in the function of maspin</td>
</tr>
<tr>
<td>Roger Wartell</td>
<td>Georgia Institute of Technology</td>
<td>Suffering the Slings and Arrows: Cellular DNA Damage &amp; Retroviral DNA Integration</td>
</tr>
<tr>
<td>Michael Weinreich</td>
<td>Van Andel Research Institute</td>
<td>The Sir2 histone deacetylase inhibits chromosomal DNA replication</td>
</tr>
<tr>
<td>Lewis V. Wray, Jr.</td>
<td>Boston University</td>
<td>Dual roles of Bacillus subtilis glutamine synthetase</td>
</tr>
<tr>
<td>Jerry Yin</td>
<td>University of Wisconsin-Madison</td>
<td>Memory Formation in Drosophila</td>
</tr>
</tbody>
</table>
29th Steenbock Symposium
Coenzymes, Cofactors and Catalysis

May 29-June 1, 2003
at the University of Wisconsin-Madison USA
<table>
<thead>
<tr>
<th>Speaker</th>
<th>Institution</th>
<th>Talk Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruma Banerjee</td>
<td>University of Nebraska</td>
<td>Redox Regulation of Homocysteine Metabolism</td>
</tr>
<tr>
<td>Squire Booker</td>
<td>Pennsylvania State University</td>
<td>Stoichiometry, Configuration, and Function of the Iron-Sulfur cluster(s) of E. coli Lipoyl Synthase</td>
</tr>
<tr>
<td>Wolfgang Buckel</td>
<td>Philipps-Universität Marburg</td>
<td>ATP induced electron transfer in clostridial 2-hydroxyglutaryl-CoA dehydratase</td>
</tr>
<tr>
<td>W. Wallace Cleland</td>
<td>University of Wisconsin-Madison</td>
<td>The Use of Isotope Effects to Determine Enzymatic Mechanisms</td>
</tr>
<tr>
<td>Perry Frey</td>
<td>University of Wisconsin-Madison</td>
<td>From Adenosylocoybin to Adenosylmethionine and Back</td>
</tr>
<tr>
<td>John Groves</td>
<td>Princeton University</td>
<td>Molecular Probes of the Mechanisms of Heme and Non-Heme Oxygenases. The Case for Oxygen Rebound</td>
</tr>
<tr>
<td>Judith Klinman</td>
<td>University of California, Berkeley</td>
<td>Investigations of the ethylene-forming enzyme, ACC Oxidase</td>
</tr>
<tr>
<td>John Lipscomb</td>
<td>University of Minnesota</td>
<td>Keeper of the Gate: Selective Methane Oxidation by Methane Monooxygenase</td>
</tr>
<tr>
<td>Hung-Wen Liu</td>
<td>The University of Texas at Austin</td>
<td>Mechanistic Studies of Unusual Enzyme Catalyses</td>
</tr>
<tr>
<td>John Markley</td>
<td>University of Wisconsin-Madison</td>
<td>Characterization of Iron-Sulfur Sites in Proteins through Combined NMR Spectroscopy and Quantum Chemical Calculations</td>
</tr>
<tr>
<td>Rowena Matthews</td>
<td>University of Michigan</td>
<td>Shake, rattle and roll: controlling the conformational changes necessary for methionine synthase catalysis</td>
</tr>
<tr>
<td>Gregory Petsko</td>
<td>Brandeis University</td>
<td>Structural Enzymology in Four Dimensions: Direct Observation of Unstable Species in Enzyme-Catalyzed Reactions</td>
</tr>
<tr>
<td>Janos Retey</td>
<td>Karlsruhe University</td>
<td>Enzyme catalysis by radical</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Talk Title</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>John Richard</td>
<td>The State University of New York, Buffalo</td>
<td>Studies on the Mechanism for Catalysis of Proton Transfer at Carbon</td>
</tr>
<tr>
<td>Dagmar Ringe</td>
<td>Brandeis University</td>
<td>Control of pyridoxal phosphate cofactor chemistry by the protein</td>
</tr>
<tr>
<td>JoAnne Stubbe</td>
<td>Massachusetts Institute of Technology</td>
<td>Radical Initiation in Class I Ribonucleotide Reductases</td>
</tr>
<tr>
<td>Susan Taylor</td>
<td>University of California, San Diego</td>
<td>The Dynamics of Signaling by PKA</td>
</tr>
<tr>
<td>Rudolf Thauer</td>
<td>Max Planck Institut fur Terrestriche, Marlburg</td>
<td>H2 - forming methylene tetrahydromethanopterin dehydrogenase from methanogenic archaea: surprises with no end</td>
</tr>
<tr>
<td>Christopher Walsh</td>
<td>Harvard University</td>
<td>Antibiotic Glycosyl Transferases</td>
</tr>
<tr>
<td>Speaker</td>
<td>Institution</td>
<td>Talk Title</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Charles Barlowe</td>
<td>Dartmouth College</td>
<td>Mechanisms of COP II Dependent Transport</td>
</tr>
<tr>
<td>Partick Brennwald</td>
<td>Cornell University</td>
<td>The Role of Two Rho GTPases in Coordination of Exocytosis and Cell Polarity in Yeast</td>
</tr>
<tr>
<td>Edwin Chapman</td>
<td>University of Wisconsin-Madison</td>
<td>The C2B-domain of synaptotagmin controls neuronal exo- and endocytosis</td>
</tr>
<tr>
<td>Leonid Chernomordik</td>
<td>The National Institutes of Health</td>
<td>Structural intermediates in viral fusion and fusion of protein-free lipid bilayers</td>
</tr>
<tr>
<td>Jens Coorsen</td>
<td>The National Institutes of Health</td>
<td>Identifying Proteins Essential to Ca2+-Triggered Membrane Fusion</td>
</tr>
<tr>
<td>Guenther Daum</td>
<td>University of Graz</td>
<td>Lipid transport in the yeast</td>
</tr>
<tr>
<td>Reid Gilmore</td>
<td>University of Worcester</td>
<td>Transfer of the ribosome-nascent chain complex from SRP to the Sec61 complex</td>
</tr>
<tr>
<td>Benjamin Glick</td>
<td>University of Chicago</td>
<td>Where Do Little Golgi Stacks Come From</td>
</tr>
<tr>
<td>Laura Liscum</td>
<td>Tufts University</td>
<td>Routes and Mechanisms of Intracellular Cholesterol Transport</td>
</tr>
<tr>
<td>Tom Martin</td>
<td>University of Wisconsin-Madison</td>
<td>The last few biochemical reactions in regulated dense-core vesicle exocytosis</td>
</tr>
<tr>
<td>Fred Maxfield</td>
<td>Cornell University</td>
<td>Lipid sorting in the endocytic pathway</td>
</tr>
<tr>
<td>Mark A. McNiven</td>
<td>Mayo Clinic</td>
<td>The Dynamin Family of Mechanoenzymes: Pinching in New Places</td>
</tr>
<tr>
<td>Christopher Nicchitta</td>
<td>Duke University</td>
<td>The Regulation of Ribosome Exchange on the Endoplasmic Reticulum Membrane</td>
</tr>
<tr>
<td>J. Wylie Nichols</td>
<td>Emory University</td>
<td>Phospholipid Trafficking in Yeast</td>
</tr>
<tr>
<td>Richard Pagano</td>
<td>Mayo Clinic</td>
<td>Membrane traffic along the endocytic pathway in sphingolipid storage diseases</td>
</tr>
<tr>
<td>Natascha Raikhel</td>
<td>Michigan State University</td>
<td>Transport to the plant vacuole:</td>
</tr>
<tr>
<td>Name</td>
<td>Institution</td>
<td>Topic</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Howard Riezman</td>
<td>University of Basel</td>
<td>ER to Golgi transport of GPI-anchored proteins</td>
</tr>
<tr>
<td>Timothy Ryan</td>
<td>Cornell University</td>
<td>Biophysical dissection of membrane and protein traffic in synaptic terminals of the CNS</td>
</tr>
<tr>
<td>Danny Schnell</td>
<td>Rutgers University</td>
<td>The role of protein import into chloroplasts and its role in plastid development</td>
</tr>
<tr>
<td>Suresh Subramani</td>
<td>University of California, San Diego</td>
<td>Import of peroxisomal matrix and membrane proteins</td>
</tr>
<tr>
<td>Gerrit van Meer</td>
<td>University of Amsterdam</td>
<td>A vesicular pathway from the Golgi depends on glycolipids; Role for the multidrug transporter MDR1 P-glycoprotein as a glycolipid flippase.</td>
</tr>
<tr>
<td>Dennis Voelker</td>
<td>University of Colorado, Denver</td>
<td>Biochemical and Genetic Analysis of Lipid Transport in Yeast</td>
</tr>
<tr>
<td>Graham Warren</td>
<td>Yale University</td>
<td>Mitotic division of the Golgi apparatus</td>
</tr>
<tr>
<td>Felix Wieland</td>
<td>Universität Heidelberg</td>
<td>Molecular mechanisms in the budding of COPI-vesicles</td>
</tr>
</tbody>
</table>
Appendix 11

First Author Publications of Graduate Students from 2006 to 2012 from Laboratories of the Department of Biochemistry – UW-Madison (474 total)

Biochemistry Graduate Program (276 publications):
Anding, A.L., J.S. Chapman, D.W. Barnett, R.W. Curley, Jr., and M. Clagett-Dame. 2007. The unhydrolyzable fenretinide analogue 4-hydroxybenzylretinone induces the proapoptotic genes GADD153 (CHOP) and Bcl-2-binding component 3 (PUMA) and apoptosis that is caspase-dependent and independent of the retinoic acid receptor. *Cancer research.* 67:6270-6277.


crystal structure of the PrpF protein of Shewanella oneidensis complexed with trans-aconitate: insights into its biological function. *Protein science: a publication of the Protein Society*. 16:1274-1284.


Sashital, D.G., and S.E. Butcher. 2006. Flipping off the riboswitch: RNA structures that control gene


**Graduate Programs other than Biochemistry** - Biophysics, Cell and Molecular Biology, Chemistry, Computer Science, Microbiology, Nutritional Sciences, Genetics, Neurosciences, Mathematics, Molecular and Cellular Pharmacology, and Toxicology - 198 publications:


Kontur, W.S., M.W. Capp, T.J. Gries, R.M. Saecker, and M.T. Record, Jr. 2010. Probing DNA binding, DNA opening, and assembly of a downstream clamp/jaw in Escherichia coli RNA polymerase-


Pegram, L.M., and M.T. Record, Jr. 2007. Hofmeister salt effects on surface tension arise from partitioning of anions and cations between bulk water and the air-water interface. *The journal of...*


Schmitz, R.J., L. Hong, K.E. Fitzpatrick, and R.M. Amasino. 2007. DICER-LIKE 1 and DICER-LIKE 3


# Appendix 12

**TYPICAL BIOCHEMISTRY MAJOR**  
4 Year Program  

<table>
<thead>
<tr>
<th>FALL</th>
<th>CREDITS</th>
<th>SPRING</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chem 103 (or 109) (or 115)</td>
<td>4 (5) (5)</td>
<td>Chem 104 (or 116)</td>
<td>5 (5)</td>
</tr>
<tr>
<td>Math 221 (or 275)</td>
<td>5</td>
<td>Math 222 (or 276)</td>
<td>5</td>
</tr>
<tr>
<td>Comm A or Elective</td>
<td>3</td>
<td>Humanities</td>
<td>3</td>
</tr>
<tr>
<td>First-Year Seminar</td>
<td>1</td>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>13-14</strong></td>
<td></td>
<td><strong>16</strong></td>
<td></td>
</tr>
</tbody>
</table>

| Year 2 | | | |
| Chem 343 | 3 | Chem 344 | 2 |
| Chem 327 or 329 | 4 | Chem 345 | 3 |
| Biocore 301 | 3 | Biocore 303 | 3 |
| Biocore 302 | 2 | Biocore 304 | 2 |
| (or Biol 151) | (5) | (or Biol 152) | (5) |
| Humanities | 3 | Ethnic Studies | 3 |
| **15** | | **4** |

| Year 3 | | | |
| Physics 207 (or 201) | 5 | Physics 208 (or 202) | 5 |
| Biocore 323 | 3 | Biocore 333 | 3 |
| (or Adv Bio) | (3) | (or Adv Bio) | (3) |
| Biochem 501 or 507 | 3 | Biochem 508 | 3 |
| Electives | 2 | Electives | 4-6 |
| International Studies | 3 | | |
| **16** | | **14** |

| Year 4 | | | |
| Chem (Physical) 565 | 4 | Chem 563 | 1 |
| Biochem 651 | 3 | Senior Thesis | 2-3 |
| Biochem Elective or Senior Thesis | 2-3 | or Senior Honor Thesis | |
| Senior Thesis | (2-3) | Electives | 9 |
| or Senior Honors Thesis | | Social Science | 3 |
| Electives | 6 | | |
| **15-16** | | **15-16** |

**FOOTNOTES:**

1Chem 109 satisfies introductory chemistry requirement in one semester.

2Biocore sequence requires: 4 lecture courses plus 2 laboratory courses or Bio/Zoo 151 & 152 plus two (6 credits) advanced Biology courses. Must complete Biocore sequence if started.

3Student must take either (1) both 507 and 508 or (2) 501 + 2 additional credits of Biochemistry

4Senior Thesis, special problems or work experience in laboratory are strongly recommended.
Biochemistry Curriculum Requirements

General Education Requirements for the university and respective colleges:

**UW-Madison** —

a. **Communication** — Part A and Part B

b. **Quantitative Reasoning** — Part A and Part B

c. **Ethnic Studies** — 3 credits

**College of Letters and Sciences (L&S)** —

a. **Foreign Language** — Three years of high school or the third level in one language.

b. **Mathematics** — Two 3 credit courses at the Intermediate level

c. **Breadth** — Exploration in the Liberal Arts & Sciences
   1. Humanities —12 credits
   2. Social Studies —12 credits
   3. Natural Science — 16 credits

**College of Agricultural and Life Sciences (CALS)** —

a. **Social Sciences and Humanities** — Total 9 credits
   1. Humanities —6 credits
   2. Social Sciences —3 credits

b. **International Studies** — 3 credits

c. **First-Year Seminar** — 1 credit
Biochemistry Major Requirements:

a. Chemistry:
   1. General Chemistry: Chem 103 and 104 or Chem 109 or Chem 115 and 116
   2. Organic Chemistry: Chem 343 and 344 and 345
   3. Analytical Chemistry: Chem 327 or Chem 329
   4. Physical Chemistry Laboratory: Chem 563
   5. Physical Chemistry Lecture: Chem 565

b. Physics: General Physics: Physics 201 and 202 or Physics 207 and 208

c. Math: Calculus and Analytic Geometry 1 and 2: Math 221 and 222 or Math 171 and 217 and 222 or Math 275 and 276

d. Biology:
   1. Introductory Biology: Zoo 151 and 152 or *Biocore 301 and 302 and 303 and 304
   2. Advanced Biology: 6 credit
      *Biocore sequence fulfills introductory and advanced biology requirements.

e. Biochemistry:
   1. Introduction to Biochemistry: Biochem 507 and 508 or Biochem 501 plus 2 credits of advanced biochemistry.
   2. Capstone course: Biochem 651

The above constitute a total of 60 credits for the major.
1. Assessment information, learning goals, and evidence of learning
The Biochemistry Department has the following goals for our undergraduate program. That the students we teach understand:

- cellular and organismal processes at a fundamental chemical level,
- how biochemical understanding is generated, and
- the nature of science.

For our Biochemistry Department undergraduate majors, we have the additional goal of helping our students appreciate the range of career options available for individuals with a degree in biochemistry. We initiate the conversation about careers with our students in our freshman seminar (in the course our students discuss this with people from a range of careers), and continue career discussions via faculty and staff advising throughout our students’ time here.

Our learning goals clearly align with a major Essential Learning Outcome for UW–Madison Students, namely ‘Knowledge of the Physical and Natural World’. Furthermore, our courses emphasize the other Essential Learning Outcomes. Rather than having our students memorize a limitless number of scientific “facts,” we strive to provide students with the type of foundational understanding that provides a basis as well as desire for lifelong learning. Our courses also emphasize inquiry, analysis, and the development of critical thinking skills. Our lab course emphasizes teamwork, problem solving, and development of written and oral communication skills.

Assessment: One form of assessment is the career paths that our graduating seniors take. Data from the CALS and our own senior exit survey indicates that well over 50% of our students will attend graduate school in the sciences or enter a professional degree program, typically in medicine or law. In our most recent survey, 65% of respondents are in this category. The majority of the remaining students enter the work force in areas in which they use their scientific training (teaching, research assistants, scientific sales, etc). Another form of assessment is how our students perform on the rigorous exams and assignments that are part of our undergraduate curriculum. Overall, our students perform well on exams and assignments; nevertheless, until all of our students are performing at an ‘A’ level, we have something to strive for. Finally data from our own senior exit survey indicates that our undergraduate majors have a high level of satisfaction with our program. We will continue to develop more thorough senior exit surveys and strive to increase the percent of our majors who respond so that we have the most thorough data possible. We will also continue to use yearly advising meetings as assessment tools. Our Undergraduate Committee will discuss the assessment data yearly and formulate plans for improvements based on this data.

2. Enhancements for teaching and learning-the Wisconsin Experience
Recent and planned enhancements for teaching and learning as they relate to the Wisconsin Experience and high-impact practices. The Department of Biochemistry is firmly committed to providing undergraduate with a strong foundation for a scientific career through classroom instruction, direct research experiences, and individual mentoring. Recently the department has made several important modifications and enhancements to its undergraduate curriculum and supporting programs to improve academic learning and independent research. These are described below:

Enhancements to Undergraduate Teaching:
- **Biochemistry 375: Biochemistry Freshman Seminar** - Previously, the majority of biochemistry undergraduates did not take, because of necessary prerequisites, their first general biochemistry
course (Biochem 501 or 507) until the third year of the curriculum. The department realized that, for most students, this was far too late in their undergraduate experience, as students could miss many valuable opportunities to advance their own professional development and to interact and engage with members of the department. To better facilitate the professional development of our first-year students, and to give them a meaningful degree-specific first-year experience seminar, the Department of Biochemistry developed a new course, Biochemistry Freshman Seminar. For a detailed description of the course objectives see Section III, 4. This course has thus far been offered for two semesters (Fall 2011 and Spring 2012), and self-assessment data has been used to evaluate attainment of course goals and as a basis for future curricular change.

- **Capstone course Revision** - The department of Biochemistry is committed to providing its undergraduate majors a meaningful capstone experience as they prepare to transition to post-baccalaureate life. To enhance the capstone experience, Biochemistry 511 and 651 were recently combined to form a single Capstone course, a revised Biochemistry 651. Biochemistry 511 was a seminar course that provided students with experiences of reading, interpreting, and presenting primary scientific literature. The old version of Biochemistry 651 was primarily a multidisciplinary, project-based lecture and laboratory course that focused on mastery of modern biochemical laboratory techniques. The integrated 511/651 capstone course has our students utilize and integrate the depth and breadth of their undergraduate learning into a meaningful capstone experience. This capstone course integrates a diverse body of knowledge and topics to enhance problem-solving, teamwork and communication skills as well as to address societal, economic, ethical, scientific, and professional issues specific to the field of biochemistry.

**Independent study opportunities** - The Biochemistry department has long recognized the value of undergraduate research to student’s intellectual and professional growth and strongly encourages students to participate in independent research experiences (Biochem 299, 699, 681-682, 691-692). Below are several mechanisms that have been recently established to further encourage and promote undergraduate research participation in the department.

- **Biochemistry Scholars Program** – this research mentoring opportunity was initiated to identify and to encourage high-performing first-year students to become engaged in mentor-guided research. The program’s broad goals are to provide hands-on research experiences as well as associated professional development such as science writing and presentation and participation in national scientific meetings.

- **Biochemistry Undergraduate Summer Research Scholarship Program** – the program was designed to promote undergraduate summer research by providing sufficient funding ($4000) to overcome potential financial hurdles that might discourage them from doing so. The department typically awards 10 – 12 summer research scholarships each year. Selection of applicants for these awards is based on a student’s academic performance and the quality of a written research proposal. Several of the awards, with funds provided by Genentech, are specifically targeted toward second semester freshman and sophomores to encourage independent research at an early stage in their academic careers. The competitive application is open to all biochemistry undergraduate majors from freshmen to seniors, and minorities are especially encouraged to apply.

- **Senior Thesis (691-692) and Senior Honors Thesis (681-682)** - to ensure a uniform and meaningful Senior thesis research experience we have recently established guidelines. To enhance our student’s research experience and their growth as scientists, students conducting an independent senior thesis project must now write a thesis research proposal within the first few weeks of the first semester and
complete a written thesis by the end of the second semester. The professor supervising the thesis must approve the proposal and grade the final thesis. Both the research proposal and thesis must also be submitted to the Biochemistry Student Services office.

International studies opportunities - The department of Biochemistry encourages undergraduates to participate in international experiences, which provide significant opportunities for personal growth, intercultural development, broadening of education and career attainment. The following three programs were recently established and are led by Biochemistry faculty:

- **Uganda Program** - The Uganda Study Abroad Program utilizes field study and classroom learning to focus on major issues that impact health and nutrition in Uganda including economics, politics, health care, HIV/AIDS and education. Students participating in this program register for a 2-3 credit seminar course during the fall semester and conduct a three-week field study in Uganda over the January break. The Uganda Program was established in 2002 by Prof. James Ntambi (Biochemistry) and has been an invaluable motivational and practical experience particularly for students whose goal is to become health care professionals.

- **SCORE Program** - The Summer Cambridge and Oxford Research Experience (SCORE) Program, which is directed by Prof. Marvin Wickens (Biochemistry) was recently established to provide a summer research experience for up to six UW-Madison undergraduate students in Oxford or Cambridge in England. Students are selected based on their academic qualifications (academic record, course work, and research experience), written personal statements and in-person interviews.

- **Khorana Program** - The Khorana Scholars program was established in 2007 by Profs. Aseem Ansari (Biochemistry) and Ken Shapiro (Agricultural and Applied Economics) to provide opportunities for UW-Madison undergraduate and graduate students to pursue a summer of research in India. Students are matched with mentors in partner academic institutions, NGOs, or private companies in India. Additional details about these programs as well as additional information for Biochemistry majors is available online [http://www.biochem.wisc.edu/undergraduate_program/default.aspx](http://www.biochem.wisc.edu/undergraduate_program/default.aspx)

Planned Enhancements to Curriculum

In addition to the enhancements described above for our capstone course, we are incorporating more active learning into 501 and 507/508. We are also striving to open our required laboratory course for Biochemistry majors, Biochem 651, to students as early as their sophomore year. Currently the majority of our majors take the Biochem 651 in their late junior or senior year because of limits on the number of students who can enroll. With new and more versatile teaching lab space, we now can open more positions in the course. Two major advantages of opening this course to students earlier is that this experience will provide a great foundation for i) conducting independent research which we encourage early in the student’s career and ii) understanding how the biochemical knowledge they will be learning in a range of courses was obtained.

3. Enhancements for teaching and learning – Technology

Recent and future enhancements for teaching and learning as they relate to the role of technology in instruction:

The University of Wisconsin-Madison instructor – student interface system, Learn@UW, has provided the department with a powerful tool that allows teachers to increase course transparency and accessibility. Teachers can upload and organize course materials, collect assignments, maintain student grades, and stimulate interactions between students and instructors. For example, nearly all of our courses have active Learn@UW websites through which we routinely distribute course syllabi, reading material, lab
manuals, lecture notes, and practice problems and exams. Many courses have also incorporated sophisticated audio/visual technology such as podcasts and lecture capture where the audio and/or visual component of each lecture is recorded and uploaded to the website for students to access when reviewing the accompanying lectures notes. From a student’s prospective, Learn@UW is valuable because it allows students to track their performance in a course. Further, by providing access to practice problems and exams, students can engage in metacognition and alter their approach to learning prior to higher stake assessments.

The integration of Clickers into several biochemistry courses has enabled biochemistry instructors to incorporate mechanisms of formative assessment into lectures, to gauge student learning in real-time, and provide opportunities for changing content and strategies for teaching on the fly. Clickers also provide a mechanism for incorporating group-based activities into lectures that stimulate peer-driven learning and provide opportunities for learning cycles.

An excellent example in which technology has recently enhanced teaching and learning is Biochemistry 651, “Biochemical Methods.” Biochem 651 is a capstone course for the biochemistry major and approximately 175 students are enrolled in the course each year. The course consists of two lectures per week, one 4-hour lab, and one student-led seminar. The lecture and seminar components have been improved using many of the mechanisms outlined above. The lab component was recently redesigned to provide a state-of-the-art research experience centered on the study of human carbonic anhydrase II (HcaII), which is an enzyme that has important biomedical relevance. Students learn multi-dimensional molecular graphic software to visualize protein structures, and using their newly identified understanding of the biochemistry and mechanism of HcaII, they design a mutation and provide a hypothesis for what they expect will happen to the activity of their mutant protein. Biochem 651 students learn how to design the mutation, clone the gene coding for HcaII, introduce the mutation, express and purify the protein, and test its enzymatic activity in vitro using a state-of-the-art fluorescence-based technique. This series of steps is central to biological research; and students leave the course familiar with modern biochemical research and adept at working with techniques and instruments that are at the forefront of biochemistry.

Our department’s Capstone course, Biochemistry 651, echoes ideas that resonate within the Wisconsin Experience. Graduates of our department and university are leaders; they draw upon classroom instruction, service learning experiences, and cultural awareness to solve problems. In Biochem 651, the students are charged with completing a mini-research project over the course of the semester. Drawing from their knowledge of general biochemistry, they design a research strategy, develop and test hypotheses, and analysis data. Our laboratory exercises in Biochem 651 presents our students with a ‘real-world’ research scenario. From these experiences, students develop critical thinking skills, practice integrating and applying conceptual knowledge, and gain molecular biology research skills applicable to graduate and professional training.

4. Recent and planned curricular and programmatic changes
The Department of Biochemistry has initiated several curricular changes in recent years to enhance undergraduate student learning. These changes, some initiated by CALS, others at the department level, have been motivated primarily by our desire to streamline the major degree requirements to enhance the likelihood of timely completion of the undergraduate degree and to increase student understanding of the biochemistry degree plan and the opportunities it affords.

Over the past few years, the following curricular changes have occurred within the Biochemistry undergraduate degree program:

- **CALS written/oral requirement removed** – CALS no longer requires additional written and oral communication courses for its undergraduate degree programs. This curriculum change was a positive one; it eliminated considerable redundancies between the college and the university level degree requirements. Biochemistry undergraduate students are required to demonstrate proficiency
in oral and written communication skills through coursework and/or examination; furthermore, fulfilling the university communication A and B requirement simultaneously satisfies the college communication degree requirement.

- **Biochemistry 651 merged with the Capstone course** – Beginning Summer 2010, the Department of Biochemistry merged Biochemistry 651, with the capstone course, Biochemistry 511. Biochemistry 511 was a seminar course that provided students with experiences of reading, interpreting, and presenting scientific primary literature. Biochemistry 651, Biochemical Methods, is a multidisciplinary, project-based lecture and laboratory course that focuses on mastery of modern biochemical laboratory techniques. In the revised capstone course, now known as Biochemistry 651, students attend class three days a week for the lecture and lab component and students meet a fourth day for the seminar component. During the 2010 – 2011 academic year, the CALS Curriculum Committee conducted a college-wide review of all CALS department’s undergraduate capstone courses. The CALS Curriculum Committee review of the Biochemistry 651 capstone course was favorable; the committee noted that the course meets most or all of the capstone criteria.

- **Economics or Agricultural and Applied Economic requirement removed** – Beginning Fall 2011, CALS no longer requires Economics or Ag and App Economics credits for its undergraduate programs. This curricular change has created more flexibility for students when fulfilling the social science degree requirement. Previously, Economics was excluded as an option for the social science requirement. Currently, Economics is not required by the college but is accepted as a social science course. Also, this change in the curriculum has resulted in a decrease in the total number of credits required to graduate from 124 credits to 120 credits.

- **The Biochemistry 375: Biochemistry Freshman Seminar Course added** - Prior to the fall semester of 2011, the Biochemistry undergraduate degree plan did not require students to take courses offered by the department until the third year of the curriculum. The department realized that, for most students, this was much too late in their undergraduate experience, as students could miss many valuable opportunities to advance their own professional development and to interact and engage with members of the department. Simultaneously, the College of Agricultural and Life Sciences modified their degree requirements to include a first year experience seminar.

  To meet the needs of students and the policy of the college, instructional academic staff in the Department of Biochemistry developed a new course, Biochemistry Freshman Seminar. The goals of the course are as follows:

  - Identify resources at the university that can help students be successful during the transition to college life;
  - Understand the discipline of Biochemistry and how it fits into the broader realm of science;
  - Understand the discipline of Biochemistry and the undergraduate curriculum to help the student decide if a biochemistry major is the right ‘fit’;
  - Understand the out-of-classroom learning opportunities that are open to Biochemistry undergraduate majors;
  - Feel like a member of the Biochemistry Department and feel comfortable approaching faculty with questions regarding their research and opportunities available in their labs;
  - Understand careers that are open to individuals with an undergraduate degree in Biochemistry;

  To protect the learning community established in the course, the following features also characterize the Biochemistry Freshman Seminar:
○ Newly entering, first-time college students are given enrollment priority;
○ The course enrollment is capped at 30 students;
○ The course involves small-group discussions that allow students the opportunity to integrate experiences from both in and outside of the classroom;

The Biochemistry department has offered the Biochemistry Freshman Seminar course two semesters thus far (Fall 2011 and Spring 2012), and self-assessment data has been used to evaluate attainment of course goals and has been the basis for future curricular change. Self-reported exit survey data demonstrates alignment of learning outcomes with intended course goals, regarding students understanding of the discipline of Biochemistry and overall course satisfaction. The exit surveys have been useful also in identifying additional topics that can be covered in the seminar class. Approximately 32% of students (n= 60 students) commented on wanting to learn more about topics covered in an Introduction to Biochemistry course and/or attend an actual Biochemistry lecture. Additionally, 16% of students (n= 60 students) suggested more class time devoted to discussing advising concerns related to the Biochemistry major. The instructional academic staff can envision the benefits of these topics and plans are underway to incorporate student suggestions in the next iteration of the course syllabus.

5. Enrollment patterns and trends
The Department of Biochemistry undergraduate program admission requirements are in line with UW-Madison College of Letters and Science, and College of Agricultural and Life Sciences admission and progression requirements. Our department requires students to have a minimum grade point average of 2.5 from the previous semester before declaring the major. Students must also maintain a GPA of 2.0 in order to continue in the major, similar to university and/or financial aid satisfactory academic progression guidelines. Graduating seniors must achieve a cumulative GPA of 2.5 in order to be eligible for the undergraduate Biochemistry degree. Our undergraduate admission requirements are designed to attract high achieving students and those students are most likely to be successful in the program. Interested students may declare the major as early as the second semester of their first year. To declare the Biochemistry major, students meet with the student services coordinator to discuss the student’s academic and professional goals; at that time, it is determined if the Biochemistry undergraduate degree plan aligns with the student’s interests and skills and talents. Students are encouraged to seek other biological degree plans and/or delay declaring the major if the admission requirements are not met.

Our department has experienced consistent growth in the number of students declaring the Biochemistry undergraduate major (see Figure 1). Multiple factors could be responsible for the increase. One possible explanation is the recognition that our degree program is designed to fit the needs of students with various post-baccalaureate aspirations such as laboratory work in the biotechnology industry, professional school, and graduate study. As such, the increase in the number of majors could reflect the interest in the aforementioned careers. For example, the biochemistry degree plan is an attractive option that would sufficiently prepare an individual for future health-related work or advanced study. Secondly, there has been overall increase in the number of biological science majors at the university. Accordingly, we observe an increase in enrollment patterns for both our non-major and major biochemistry courses (see Figures 2 – 7). The number of life science majors and the fact that most life science degree programs on campus require Biochemistry 501 likely contributes to the increase in enrollment in our non-major biochemistry course. The increase in enrollment in Biochemistry 507/508, 550, 575 and 651 mirrors the increase in the total number of biochemistry majors (see Figures 1 – 7).
Students from educationally underrepresented groups have access to our undergraduate program. In recent years, the numbers of targeted minorities and low-income students (defined as those students receiving the Federal Pell Grant) have increased. For example, the number of targeted minorities enrolled in our undergraduate program has grown from 4% to 8% in the last decade. Likewise, nearly 20% of our undergraduate majors are first-generation students (see Figure 1). The Department of Biochemistry is also accessible to transfer students. In anticipation of the needs of transfer students, the student services coordinator attends Transfer SOAR orientation in the summer and winter; and there, he can advise and provide resources to those students. The Biochemistry Freshman Seminar as well as other first year experience seminars within CALS is available to transfer students to foster a seamless transition.

6. Degree completion patterns and trends
The majority of students who enter the biochemistry undergraduate degree program obtain their degree with a time to degree close to four academic years. In the last ten years, the number of biochemistry undergraduate degrees awarded has nearly doubled (see Figure 8 - 9). Targeted minorities and first generation students complete their degree at rates comparable to the general biochemistry undergraduate population (Compare Figures 1 and 8). Targeted minorities and first generation college students that complete the biochemistry degree, do so in variable time frames (see Figure 9).

The Department of Biochemistry has worked diligently to meet the needs and the capacity of our all students. Biochemistry 651, the capstone course, has been a bottleneck in the curriculum in the past. With increasing enrollment, the space limits of our teaching lab space in the old biochemistry teaching laboratory started to create a problem in our ability to accommodate our majors. We recently renovated our original 1916 Biochemistry Building and in doing so, built a large, modern teaching lab to meet the demand of our majors. While the teaching lab was under construction, our department taught the Biochemistry 651 course in the instructional laboratory space of the Department of Bacteriology. During that time, we expanded the number sections offered which allowed us to serve more of our students (see Figure 7). Fall 2012 will be the first semester that Biochemistry 651 will be taught in the renovated teaching lab space. The goal of the Biochemistry 651 teaching team is to enroll 94 students each semester, with the possibility of teaching the course in the summer. These two options will eliminate the bottleneck and allow the department to open the course to non-biochemistry majors.

7. Instructional Roles
Undergraduate students enrolled in courses in the Department of Biochemistry are exposed to a variety of professionals during course instruction. The following outlines the roles of faculty, staff, and graduate students in delivery of the undergraduate curriculum.

- **Biochemistry 375: Biochemistry Freshman Seminar** – The seminar course meets once a week over the duration of the semester. Approximately 40% of the class meetings are led by an instructional academic staff member. The instructor’s role is to provide constancy and structure to the course, as they attend all class meetings, inform students of course announcements and upcoming assignments, and provide students written feedback on graded assignments. Approximately 40% of the class meetings are led by faculty members in the department. When faculty members lead class, they discuss the vibrant research programs they manage, how they became interested in a career in science and research, as well undergraduate research opportunities that are available in their labs. Lastly, 20% of instructional time is dedicated to special guests that come to class to share with students information regarding biochemistry degree requirements, career opportunities open to individuals with degrees in biochemistry, and for members of the Undergraduate Biochemistry Student Organization to share their experiences in the Biochemistry Department and at UW-Madison.
Biochemistry 501: Introduction to Biochemistry – Introduction to Biochemistry is a large, one-semester lecture course serving primarily non-Biochemistry undergraduate majors. The course meets three times a week, is offered both fall and spring semesters, and is team-taught by three faculty members and one instructional academic staff person. The course is divided into four topics/sections, of 10 -11 lectures. During a given section, the teacher at the time is responsible for course instruction, associated problem sets and answers, maintaining office hours, and preparing his/her examination material for that unit. Graduate students (4 per semester) conduct the twice weekly discussion session and contribute to preparation of exams.

Biochemistry 507 & 508: General Biochemistry I & II– General Biochemistry I & II represent a two semester sequence typically taken by undergraduate Biochemistry majors. The courses meet three times a week, are team taught by two faculty members, and are divided into two sections, each consisting of 20 lectures per section. Each faculty member is responsible for course instruction, associated problem sets and answers, maintaining office hours, and preparing his/her examination material for that unit. Four graduate students participate in the course each semester. They each lead one discussion session each week, have one office hour each week and participate in exam preparation and grading.

Biochemistry 550: Topics in Medical Biochemistry – Topics in Medical Biochemistry is a one-semester, upper level undergraduate biochemistry course that typically serves Biochemistry majors. A single faculty member primarily delivers instruction and one graduate student supports this course. The graduate student who participates in teaching of 550 has the opportunity to give a lecture, organize and grade problem sets, lead discussions and/or exam review sessions, and provide guidance on poster presentation preparation.

Biochemistry 575: Biology of Viruses – Biology of Viruses is a one-semester, upper level undergraduate biochemistry course that typically serves Biochemistry and Microbiology majors. Two faculty members (one from the Biochemistry Department faculty and one from the Medical Microbiology and Immunology Department) deliver the majority of the instruction. The two graduate students present one or more in-class lectures, contribute exam material and provide feedback to students.

Biochemistry 651: Biochemical Methods – Biochemical Methods is our capstone experience for Biochemistry undergraduate majors. This course consists of two main components, the laboratory and the seminar. For the laboratory, students meet three times a week: once for a lecture on the science and technology of the techniques that will be used in lab that week, a second class meeting is dedicated to a pre-lecture on the specifics of the lab, and the third class meeting is dedicated to experiments in the lab. In the seminar component, students meet once a week to read and critically analyze scientific literature to observe practical application of laboratory techniques.

Each semester, one faculty member and one instructional academic staff lead the lectures on the science background behind the experiments carried out in the laboratory sessions. Eight graduate students also participate in the course. Each has the opportunity to present one pre-lab lecture to the class on the more practical aspects of the experimental protocols. Pairs of graduate students oversee laboratory sections of 24 students, demonstrating techniques, in general assisting students and ensuring that safety procedures are followed.

For the seminar component, the class is divided into ten smaller learning communities of six to ten students. Either a senior graduate student or a post-doctoral scholar in the department serves as the seminar instructor, under the guidance of either a faculty member or the academic staff instructor. Seminar instructors choose a topic and a collection of relevant primary scientific
literature that is read by their respective group over the semester. The seminar instructor also provides feedback to the students on their presentations.

The Biochemistry department utilizes a combination of faculty, staff, and graduate students to deliver its undergraduate curriculum. Faculty, staff, and graduate students interested in teaching are encouraged to take advantage of the myriad professional development opportunities that exist on campus here at UW-Madison. Programs that members of the department have participated in and greatly benefitted from are listed below.

- **The Delta Program** – the goals of the Delta Program are to improve undergraduate education by using teaching experiences of graduate students, staff, and faculty to develop and implement effective teaching practices for the diverse student body at UW-Madison. The Delta program offers courses, certificate programs, roundtable discussions, and on-line training. Some of the more popular courses include The College Classroom, Diversity of the College Classroom, Effective Teaching with Technology, and Instructional Materials Development. Individuals that complete the aforementioned classes learn basic learning theory and effective teaching methods, how definitions of diversity influence learning, how to choose and incorporate appropriate forms of technology into courses, and practice developing course material for an undergraduate class.

- **Wisconsin Program for Scientific Teaching** – the goal of WPST is to enhance undergraduate biology education by training instructors to apply the scientific approach of research to teaching and learning. Three training opportunities are available:
  - **Teaching Fellows Program** – Over the fall semester, participants (graduate students and/or postdocs) learn about current teaching pedagogy, effective ways to teach science, and develop teaching modules for an undergraduate course. In the spring semester, teaching fellows implement their teaching materials, collect assessment data on the effectiveness of their modules, and present their data at the annual, campus-wide Teaching and Learning Symposium.
  - **Scientific Teaching Course** – is a one-semester course meant to accompany teaching experiences for first time teaching assistants. Participants gain knowledge about teaching and learning.
  - **Scientific Teaching Postdocs Program** – Postdocs have the opportunity to co-facilitate group work at a national science education meeting. The postdocs are also responsible for leading and evaluating a teaching workshop.

- **New Educators Orientation/Teacher Improvement Program** – the goal of NEO/TIP is to provide new and continuing teaching assistants with professional and practical tools to enhance effective teaching through a series of workshops. The College of Agricultural and Life Sciences supports the mission of the program and thereby pays the cost of registration for graduate students that support courses within the college.

- **Book groups** – the Institute for Biology Education at UW-Madison hosts book groups every semester that focuses on teaching pedagogy, diversity, and student learning. The book group represents an opportunity to bring teachers together to learn, dialogue, and share ideas that relate to teaching and learning. Some of the more recent books read by members of the department that participate in book group include, “A Hope in the Unseen,” “How Learning Works,” and “Teaching What You Don’t Know.”
8. Advising and academic support/mentoring
Undergraduate students in the Department of Biochemistry are assigned two academic advisers, one faculty member and student services coordinator, James Hardy (previously Daniel Barnish, who served in this role for 10 years). Faculty advisers are points of reference for research mentoring and post-baccalaureate professional development. The student services coordinator is the students’ primary adviser for concerns relating to the curriculum and enrollment, academic planning, research and internship opportunities, and campus-level student support services. Moreover, two instructional academic staff members provide advising assistance and insight into biochemistry course content to our student services coordinator and to our undergraduate students.

In addition to mentoring offered by assigned faculty members and the student services coordinator, the Department of Biochemistry has multiple opportunities to further mentor its undergraduate biochemistry students. The list below outlines those experiences.

- **Peer Mentoring** - Undergraduate Biochemistry Student Organization is a student group focused on creating community among undergraduates in the department. UBSO coordinates multiple events during the academic year to increase visibility and to foster opportunities for networking within the department. Some noteworthy events include participation in CALS orientation, the fall kick-off BBQ, monthly meetings, participation in the Biochemistry Freshman Seminar course, service learning projects, and the Senior Send-off Celebration.

- **Research Mentoring** - The department recognizes the value of undergraduate research to student’s intellectual and professional growth. As such, there are multiple mechanisms in place to encourage and promote undergraduate research participation specifically for our majors.
  
  o **Biochemistry Scholars Program** – this research mentoring opportunity is targeted to high performing first year students that are interested in mentor-guided research. The program’s broad goals are to provide hands-on research experiences as well as associated professional development such as science writing and presentation and participation in national scientific meetings.

  o **Biochemistry Undergraduate Summer Research Scholarship Program** – the program is designed to help remove the financial disincentive that discourages undergraduate students from engaging in research. The scholarship amount is $4,000. The department typically awards 10 – 12 scholarships each year. The competitive application is open to all biochemistry undergraduate majors from freshmen to seniors, and minorities are especially encouraged to apply.

- **Tutoring** – Peer Mentor Tutoring is a free tutorial program offered by the department to at-risk students enrolled in Biochemistry 501: Introduction to Biochemistry. At-risk students are identified based on overall grade point averages of 2.5 or below. These small learning communities provide an open, safe environment to ask questions, work additional problems, and receive clarification of course concepts. The PMT groups are lead by undergraduate students who have excelled in either Biochemistry 501 or in Biochemistry 507/508. Thus, PMT tutors are both non-biochemistry majors and biochemistry majors. The tutors attend weekly workshops to learn effective teaching strategies. CALS awards our PMT tutors scholarships in the amount of $1,000 for their service.

The Department of Biochemistry’s undergraduate program and advising resources are well matched with the college’s resources. Several members of the faculty and staff serve on college committees and participate in instruction for inter-college teaching. Specifically, Prof Bednarek serves as the chair of the CALS
Curriculum Committee. Instructional academic staff member, Dr. Kelley Harris-Johnson will serve on the college’s Scholastic Policies and Actions Committee. James Hardy will serve as an instructor in InterAg 155: CALS Freshman Seminar. Additionally, James Hardy participates in SOAR planning and advising. These interactions between department members and the college maintain vibrant relationships and create numerous opportunities for dialogue regarding undergraduate student services.

There are initiatives planned to increase the efficiency and effectiveness of undergraduate advising and support. These efforts center on improving how information is collected, organized, and disseminated to our majors. In the near future, instructional academic staff and the student services coordinator will redesign the undergraduate website with the goal of increasing the accuracy and applicability of material posted.

**Note on figure legends:** The count of Biochemistry majors is as the official semester census date, the 10th day of class. We are defining targeted minorities as students who self-identify as African-American, Hispanic/Latino(a), American Indian, and/or Southeast Asian (Hmong, Cambodian, Laotian, or Vietnamese). Pell grant recipients are students who receive a Federal Pell Grant. These grants are targeted to low income students and this metric is often used as a proxy for socioeconomic diversity. First generation students are students whose parents have not completed a four-year bachelors degree. The University of Wisconsin – Madison began asking entering students the first generation question, fall 2005.
Note on the figure legends: Degree counts are for an academic year (summer, fall, spring). Time to degree calculates time from the start of a student’s first semester at UW-Madison until their commencement date. According to this method of measuring degree completion time, 3.72 years is the elapse time during four academic years. Targeted minorities include students who are African-American, Hispanic/Latino(a), American Indian, and/or Southeast Asian (Hmong, Cambodian, Laotian, or Vietnamese). First generation students are students whose parents have not completed a four-year bachelors degree. The university began asking this question fall 2005.
Appendix 14

Biochemistry Undergraduate Research Scholarship

Purpose

To aid undergraduates in gaining focused, full-time research experience early in their academic career

Condition of the Award

• Work in the lab full-time during the summer following receipt of the award
• Submit a research report of approximately 500 to 1,000 words upon completion of research (no later than the first day of class of the fall term)

Eligibility

• Recipient must be a student at time research is carried out
• Student must be a Biochemistry major
• Project is not eligible if supported by any other undergraduate scholarship or grant

Selection Criteria

• Quality of research proposal
• Originality and intellectual significance of research
• Academic achievement

Application Process

• Project Proposal: No more than five double-spaced pages with a least 1 inch margins and no smaller than 11 pt font. The abstract and references are included in the 5-page limit. All proposals should contain the following:
  o Abstract (200 words or less, may be single-spaced)
  o Background & Significance (literature review)
  o Methods (plans for data collection and analysis)
  References (may be single-spaced)
• Personal Statement: One page summary of personal interests, career goals, and previous lab experience
• CV: Example on website
• UW-Madison Transcript: Provided by department
• Recommendation Letter: Letter of support from Biochemistry faculty member in charge of the project. The letter should address the significance of the project and the ability of the applicant to carry out the proposed research.
• Deadline: February (same time as Hilldale)
• Notification: Late April (after Hilldale)
## Appendix 15

### Hilldale Undergraduate/Faculty Research Fellowships

<table>
<thead>
<tr>
<th>Year</th>
<th>Student</th>
<th>Major</th>
<th>Research Advisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>Vu, Maria</td>
<td>Biochemistry</td>
<td>Cleland, W Wallace</td>
</tr>
<tr>
<td>1997</td>
<td>Nguyen, Thang</td>
<td>Biochemistry</td>
<td>Cox, Michael</td>
</tr>
<tr>
<td>1997</td>
<td>Goers, Trudie</td>
<td>Molecular Biology</td>
<td>Hayes, Colleen</td>
</tr>
<tr>
<td>1997</td>
<td>Contreras, Carlo</td>
<td>Biochemistry</td>
<td>Nibert, Max</td>
</tr>
<tr>
<td>1997</td>
<td>Caucutt, George</td>
<td>Chemistry</td>
<td>Raines, Ronald</td>
</tr>
<tr>
<td>1997</td>
<td>Grilley, Juneko</td>
<td>Molecular Biology</td>
<td>Raines, Ronald</td>
</tr>
<tr>
<td>1998</td>
<td>Buono, Kelly</td>
<td>Biochemistry</td>
<td>Amasino, Richard</td>
</tr>
<tr>
<td>1998</td>
<td>Martinelli, Susan</td>
<td>Biochemistry</td>
<td>DeLuca, Hector</td>
</tr>
<tr>
<td>1998</td>
<td>Drews, Timothy</td>
<td>Biochemistry</td>
<td>Ntambi, James</td>
</tr>
<tr>
<td>1999</td>
<td>Jachimiak, Luckasz</td>
<td>Biochemistry</td>
<td>Craig, Elizabeth</td>
</tr>
<tr>
<td>1999</td>
<td>Laundre, Bryan</td>
<td>Biochemistry</td>
<td>Fox, Brian</td>
</tr>
<tr>
<td>1999</td>
<td>Staniszewski, Kristine</td>
<td>Biochemistry</td>
<td>Raines, Ronald</td>
</tr>
<tr>
<td>1999</td>
<td>Waddell, Michael</td>
<td>Biochemistry</td>
<td>Raines, Ronald</td>
</tr>
<tr>
<td>2000</td>
<td>Lokker, Nicole</td>
<td>Biochemistry</td>
<td>Claggett-Dame, Margaret</td>
</tr>
<tr>
<td>2000</td>
<td>Vokal, Danielle</td>
<td>Bacteriology</td>
<td>Reznikoff, William</td>
</tr>
<tr>
<td>2001</td>
<td>Modica, Mike</td>
<td>Biochemistry</td>
<td>Cox, Michael</td>
</tr>
<tr>
<td>2001</td>
<td>Gierahn, Todd</td>
<td>Biochemistry</td>
<td>Fox, Brian</td>
</tr>
<tr>
<td>2001</td>
<td>Ooi, Lisa</td>
<td>Biochemistry</td>
<td>Fox, Brian</td>
</tr>
<tr>
<td>2001</td>
<td>Theisen, Joshua</td>
<td>Biochemistry</td>
<td>Friesen, Paul</td>
</tr>
<tr>
<td>2001</td>
<td>Petrie, Matt</td>
<td>Biochemistry</td>
<td>Martin, Thomas</td>
</tr>
<tr>
<td>2001</td>
<td>Wilson, Nathan</td>
<td>Biochemistry</td>
<td>Montgomery, Rebecca</td>
</tr>
<tr>
<td>2001</td>
<td>Cullen, Michael</td>
<td>Biochemistry</td>
<td>Ntambi, James</td>
</tr>
<tr>
<td>2001</td>
<td>Kurten, Erin</td>
<td>Biochemistry</td>
<td>Raines, Ronald</td>
</tr>
<tr>
<td>2001</td>
<td>King, Ryan</td>
<td>Genetics</td>
<td>Rayment, Ivan</td>
</tr>
<tr>
<td>2001</td>
<td>Metzler, Jeremy</td>
<td>Genetics</td>
<td>Reznikoff, William</td>
</tr>
<tr>
<td>2002</td>
<td>Piton, Karen</td>
<td>Genetics</td>
<td>Amasino, Richard</td>
</tr>
<tr>
<td>2002</td>
<td>Ho, Lena</td>
<td>Biochemistry</td>
<td>Cox, Michael</td>
</tr>
<tr>
<td>2002</td>
<td>Crain, Jessica</td>
<td>Biochemistry</td>
<td>Montgomery, Rebecca</td>
</tr>
<tr>
<td>2002</td>
<td>Soesanto, Yudi</td>
<td>Biochemistry</td>
<td>Ntambi, James</td>
</tr>
<tr>
<td>2002</td>
<td>Bruegl, Amanda</td>
<td>Biochemistry</td>
<td>Reznikoff, William</td>
</tr>
<tr>
<td>2002</td>
<td>Aw, Sherry</td>
<td>Biochemistry</td>
<td>Wickens, Marvin</td>
</tr>
<tr>
<td>2003</td>
<td>Keller, Melissa</td>
<td>Biochemistry</td>
<td>Amasino, Richard</td>
</tr>
<tr>
<td>2003</td>
<td>Riebau, Anne</td>
<td>French</td>
<td>Butcher, Samuel</td>
</tr>
<tr>
<td>2003</td>
<td>Federhart, Katherine</td>
<td>Biochemistry</td>
<td>Claggett-Dame, Margaret</td>
</tr>
<tr>
<td>2004</td>
<td>Luty, Christopher</td>
<td>Biochemistry</td>
<td>Ansari, Aseem</td>
</tr>
<tr>
<td>2004</td>
<td>Rosu, Simona</td>
<td>Biochemistry</td>
<td>Cox, Michael</td>
</tr>
<tr>
<td>2004</td>
<td>Wolf, Daniel</td>
<td>Biochemistry</td>
<td>Craig, Elizabeth</td>
</tr>
<tr>
<td>2004</td>
<td>Bush, Molly</td>
<td>Biochemistry</td>
<td>DeLuca, Hector</td>
</tr>
<tr>
<td>2004</td>
<td>Bruggink, Sean</td>
<td>Biochemistry</td>
<td>Ntambi, James</td>
</tr>
<tr>
<td>2004</td>
<td>Fula, Bernard</td>
<td>Biochemistry</td>
<td>Raines, Ronald</td>
</tr>
<tr>
<td>2005</td>
<td>Hong, Lewis</td>
<td>Bacteriology</td>
<td>Amasino, Richard</td>
</tr>
<tr>
<td>2005</td>
<td>Yatzeck, Melissa</td>
<td>Biochemistry</td>
<td>Raines, Ronald</td>
</tr>
<tr>
<td>2006</td>
<td>Goiffon, Reece</td>
<td>Molecular Biology</td>
<td>Cox, Michael</td>
</tr>
<tr>
<td>2006</td>
<td>Tan, Meng Kwang Marcus</td>
<td>Biochemistry</td>
<td>Cox, Michael</td>
</tr>
<tr>
<td>2006</td>
<td>Lim, Hui Jun</td>
<td>Biochemistry</td>
<td>Montgomery, Rebecca</td>
</tr>
<tr>
<td>2006</td>
<td>Lin, Shawn</td>
<td>Biochemistry</td>
<td>Raines, Ronald</td>
</tr>
<tr>
<td>2006</td>
<td>Walker, Laura</td>
<td>Biochemistry</td>
<td>Rayment, Ivan</td>
</tr>
<tr>
<td>2007</td>
<td>Ng, Yi Han</td>
<td>Biochemistry</td>
<td>Fox, Brian</td>
</tr>
<tr>
<td>2007</td>
<td>Kung, Vanessa</td>
<td>Chemistry</td>
<td>Raines, Ron</td>
</tr>
<tr>
<td>2007</td>
<td>Molenda, Joseph</td>
<td>Biochemistry</td>
<td>Weibel, Doug</td>
</tr>
<tr>
<td>Year</td>
<td>Student</td>
<td>Major</td>
<td>Research Advisor</td>
</tr>
<tr>
<td>------</td>
<td>--------------------</td>
<td>------------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>2007</td>
<td>Son, Sona</td>
<td>Biochemistry</td>
<td>Wiese, Christiane</td>
</tr>
<tr>
<td>2008</td>
<td>Wiersma, Anneka</td>
<td>Biochemistry</td>
<td>Clagett-Dame, Margaret</td>
</tr>
<tr>
<td>2008</td>
<td>Klugman, Sarit</td>
<td>Biochemistry</td>
<td>Cox, Michael</td>
</tr>
<tr>
<td>2008</td>
<td>Pua, Khian Hong</td>
<td>Biochemistry</td>
<td>Raines, Ronald</td>
</tr>
<tr>
<td>2008</td>
<td>Burns, Charles</td>
<td>Biochemistry</td>
<td>Weibel, Douglas</td>
</tr>
<tr>
<td>2008</td>
<td>McMaster, Sean</td>
<td>Biochemistry</td>
<td>Weibel, Douglas</td>
</tr>
<tr>
<td>2009</td>
<td>Duratinsky, Joseph</td>
<td>Medical Microbiology and Immunology</td>
<td>Clagett-Dame, Margaret</td>
</tr>
<tr>
<td>2009</td>
<td>Bane, Lukas</td>
<td>Biochemistry</td>
<td>Cox, Michael</td>
</tr>
<tr>
<td>2010</td>
<td>Huang, Samuel</td>
<td>Molecular Biology</td>
<td>Butcher, Samuel</td>
</tr>
<tr>
<td>2010</td>
<td>Piechura, Joseph</td>
<td>Biochemistry</td>
<td>Cox, Michael</td>
</tr>
<tr>
<td>2010</td>
<td>Gu, Lucas</td>
<td>Biochemistry</td>
<td>Craig, Elizabeth</td>
</tr>
<tr>
<td>2010</td>
<td>Kamer, Kimberli</td>
<td>Biomedical Engineering</td>
<td>Raines, Ronald</td>
</tr>
<tr>
<td>2011</td>
<td>Walsh-Felz, Devin</td>
<td>Biology</td>
<td>Amasino, Rick</td>
</tr>
<tr>
<td>2011</td>
<td>Reiland, Hannah</td>
<td>English</td>
<td>Assadi-Porter, Fariba</td>
</tr>
<tr>
<td>2011</td>
<td>Zillmer, Krista</td>
<td>Nutritional Sciences</td>
<td>Clagett-Dame, Margaret</td>
</tr>
<tr>
<td>2011</td>
<td>Won, Sang Joon</td>
<td>Biochemistry</td>
<td>Cox, Michael</td>
</tr>
<tr>
<td>2011</td>
<td>Barber, Grant</td>
<td>Biochemistry</td>
<td>Pagliarini, David</td>
</tr>
<tr>
<td>2011</td>
<td>Prince, Joel</td>
<td>Biochemistry</td>
<td>Raines, Ronald T.</td>
</tr>
<tr>
<td>2011</td>
<td>Trevino-Dopatka, Sonia</td>
<td>Biochemistry</td>
<td>Weibel, Douglas</td>
</tr>
<tr>
<td>2012</td>
<td>Menninga, Nathan</td>
<td>Biochemistry</td>
<td>Adler, Julius</td>
</tr>
<tr>
<td>2012</td>
<td>Sun, Yuliang</td>
<td>Biochemistry</td>
<td>Hoskins, Aaron</td>
</tr>
<tr>
<td>2012</td>
<td>Kolb, Kellie</td>
<td>Biochemistry</td>
<td>Landick, Robert</td>
</tr>
<tr>
<td>2012</td>
<td>Voss, Michael</td>
<td>Biochemistry</td>
<td>Landick, Robert</td>
</tr>
<tr>
<td>2012</td>
<td>Jeevananthan, Athavi</td>
<td>Biochemistry</td>
<td>Pagliarini , David</td>
</tr>
<tr>
<td>2012</td>
<td>Davis, Amy</td>
<td>Biochemistry</td>
<td>Raines, Ronald</td>
</tr>
<tr>
<td>2012</td>
<td>Sacotte, Ryan</td>
<td>Biochemistry</td>
<td>Weibel, Douglas</td>
</tr>
</tbody>
</table>
Appendix 16

Teaching

2010 - 2011
&
2011 - 2012
Academic Years
<table>
<thead>
<tr>
<th>Name</th>
<th>Course</th>
<th>Approx. Enrollment</th>
<th>Credits</th>
<th>Lectures Taught</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Richard Amasino</strong></td>
<td>Biochem 501</td>
<td>900/year</td>
<td>3</td>
<td>22/year</td>
<td>Fall &amp; Spring</td>
</tr>
<tr>
<td></td>
<td>Biochem 840</td>
<td>20</td>
<td>3</td>
<td>7</td>
<td>Alternate Falls</td>
</tr>
<tr>
<td><strong>Aseem Ansari</strong></td>
<td>Biochem 875</td>
<td>12</td>
<td>2</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 710</td>
<td>25</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>Alan Attie</strong></td>
<td>Biochem 508</td>
<td>170</td>
<td>3</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 916</td>
<td>15</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Botany 860</td>
<td>?</td>
<td>2</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td><strong>Sebastian Bednarek</strong></td>
<td>Biochem 501</td>
<td>~800/year</td>
<td>3</td>
<td>24/year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 905</td>
<td>12</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 801</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 710</td>
<td>20</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 550</td>
<td>25</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Margaret Clagett-Dame</strong></td>
<td>PharmSci 780</td>
<td>12</td>
<td>3</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 729</td>
<td>24</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 710</td>
<td>25</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pharm Sci 421</td>
<td>135</td>
<td>4</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NutrSci 875</td>
<td>25</td>
<td>1</td>
<td>2</td>
<td>every other year</td>
</tr>
<tr>
<td></td>
<td>NutrSci 627</td>
<td>25</td>
<td>1</td>
<td>2</td>
<td>every other year</td>
</tr>
<tr>
<td><strong>W. Wallace Cleland</strong></td>
<td>Biochem 624</td>
<td>11</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 625</td>
<td>20</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Samuel Butcher</strong></td>
<td>Biochem 501</td>
<td>~800/year</td>
<td>3</td>
<td>24/year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 905</td>
<td>12</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 801</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 710</td>
<td>20</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 550</td>
<td>25</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Margaret Clagett-Dame</strong></td>
<td>PharmSci 780</td>
<td>12</td>
<td>3</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 729</td>
<td>24</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 710</td>
<td>25</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pharm Sci 421</td>
<td>135</td>
<td>4</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NutrSci 875</td>
<td>25</td>
<td>1</td>
<td>2</td>
<td>every other year</td>
</tr>
<tr>
<td></td>
<td>NutrSci 627</td>
<td>25</td>
<td>1</td>
<td>2</td>
<td>every other year</td>
</tr>
<tr>
<td><strong>Michael Cox</strong></td>
<td>Biochem 507</td>
<td>250</td>
<td>3</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 701</td>
<td>35</td>
<td>1</td>
<td>7</td>
<td>organizer</td>
</tr>
<tr>
<td></td>
<td>Biochem 289</td>
<td>30</td>
<td>1</td>
<td>seminar</td>
<td>honors credit for 507</td>
</tr>
<tr>
<td><strong>Brian Fox</strong></td>
<td>Biochem 625</td>
<td>15</td>
<td>3</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 909</td>
<td>10</td>
<td>1</td>
<td>seminar</td>
<td>Fall</td>
</tr>
<tr>
<td></td>
<td>Biochem 909</td>
<td>10</td>
<td>1</td>
<td>seminar</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td>Biochem 909</td>
<td>10</td>
<td>1</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>909 Found. Of Biotech.</td>
<td>25</td>
<td>1</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td><strong>Paul Friesen</strong></td>
<td>Biochem 575</td>
<td>104</td>
<td>2</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 910</td>
<td>20</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td><strong>Colleen Hayes</strong></td>
<td>Biochem 550</td>
<td>45</td>
<td>2</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td><strong>Hazel Holden</strong></td>
<td>Biochem 601</td>
<td>70</td>
<td>2</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td><strong>Laura Kiessling</strong></td>
<td>Biochem 704</td>
<td>25</td>
<td>2</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 945</td>
<td>26</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chem 943</td>
<td>8</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chem 843</td>
<td>30</td>
<td>3</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td><strong>Judith Kimble</strong></td>
<td>Biochem 703</td>
<td>24</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 912</td>
<td>12</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Course</td>
<td>Credits</td>
<td>Type</td>
<td>Schedule</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>-----------</td>
<td>---------</td>
<td>----------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>Robert Landick</td>
<td>Biochem 801</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>John Markley</td>
<td>Biochem 801</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thomas Martin</td>
<td>Biochem 906</td>
<td>8</td>
<td>seminar</td>
<td>Fall &amp; Spring</td>
<td></td>
</tr>
<tr>
<td>Julie Mitchell</td>
<td>Biochem 606</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>David Nelson</td>
<td>Biochem 901</td>
<td>16</td>
<td>seminar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>James Ntambi</td>
<td>Biochem 501</td>
<td>900/year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NutrSci 619</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CALS 375</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 711</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bioinformatics</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 660</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 711</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 729</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 711</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 660</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chem 872</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>David Pagliarini</td>
<td>Biochem 901</td>
<td>20</td>
<td>seminar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ann Palmenberg</td>
<td>Biochem 711</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bioinformatics</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 660</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>George Phillips</td>
<td>Biochem 636</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 915</td>
<td>25</td>
<td>seminar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 729</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 711</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 660</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chem 872</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. Wesley Pike</td>
<td>Biochem 704</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ronald Raines</td>
<td>Biochem 704</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 945</td>
<td>26</td>
<td>seminar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Micro 545</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chem 842</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivan Rayment</td>
<td>Biochem 710</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 601</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 909</td>
<td>12</td>
<td>seminar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M. Thomas Record</td>
<td>Biochem 565/665</td>
<td>130</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 872</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>George Reed</td>
<td>Biochem 625</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 624</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 909</td>
<td>20/year</td>
<td>seminar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alessandro Senes</td>
<td>Biochem 651</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Douglas Weibel</td>
<td>Biochem 651</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 511</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 704</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marvin Wickens</td>
<td>Biochem 660</td>
<td>25</td>
<td></td>
<td>organizer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 799</td>
<td>15</td>
<td>seminar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 703</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Course</td>
<td>Approx. Enrollment</td>
<td>Lectures Taught</td>
<td>Comments</td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------</td>
<td>-------------------</td>
<td>-----------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>Richard Amasino</td>
<td>Biochem 501</td>
<td>900/year</td>
<td>3</td>
<td>Fall &amp; Spring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 840</td>
<td>20</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 710</td>
<td>25</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aseem Ansari</td>
<td>Biochem 620</td>
<td>80</td>
<td>2</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Alan Attie</td>
<td>Biochem 901</td>
<td>16</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 710</td>
<td>25</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Sebastian Bednarek</td>
<td>Biochem 508</td>
<td>198</td>
<td>3</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 916</td>
<td>12</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 375</td>
<td>30</td>
<td>1</td>
<td>contribute</td>
<td></td>
</tr>
<tr>
<td>Samuel Butcher</td>
<td>Biochem 501</td>
<td>900/year</td>
<td>3</td>
<td>24/year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 905</td>
<td>12</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 801</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 710</td>
<td>20</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 550</td>
<td>25</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Margaret Clagett-Dame</td>
<td>PharmSci 780</td>
<td>12</td>
<td>3</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 729</td>
<td>24</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 710</td>
<td>25</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pharm Sci 421</td>
<td>135</td>
<td>4</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NutrSci 875</td>
<td>25</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NutrSci 627</td>
<td>25</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>W. Wallace Cleland</td>
<td>Biochem 624</td>
<td>8</td>
<td>2</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 625</td>
<td>20</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Michael Cox</td>
<td>Biochem 507</td>
<td>250</td>
<td>3</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 907</td>
<td>1</td>
<td>seminar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 701</td>
<td>20</td>
<td>1</td>
<td>7</td>
<td>Organizer</td>
</tr>
<tr>
<td>Brian Fox</td>
<td>Biochem 625</td>
<td>15</td>
<td>3</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 909</td>
<td>10</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 909</td>
<td>10</td>
<td>1</td>
<td>seminar</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td>Biochem 901</td>
<td>25</td>
<td>1</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Paul Friesen</td>
<td>Biochem 575</td>
<td>103</td>
<td>2</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 910</td>
<td>20</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td>Colleen Hayes</td>
<td>Biochem 550</td>
<td>48</td>
<td>2</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NutrSci 875</td>
<td>24</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Hazel Holden</td>
<td>Biochem 601</td>
<td>60</td>
<td>2</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 909</td>
<td>10</td>
<td>1</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td>Aaron Hoskins</td>
<td>Biochem 704</td>
<td>40</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BME 619</td>
<td>30</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Laura Kiessling</td>
<td>Biochem 704</td>
<td>21</td>
<td>2</td>
<td>12</td>
<td>Spring</td>
</tr>
<tr>
<td></td>
<td>Biochem 704</td>
<td>29</td>
<td>2</td>
<td>10</td>
<td>Fall</td>
</tr>
<tr>
<td></td>
<td>Chem 843</td>
<td>19</td>
<td>1</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Judith Kimble</td>
<td>Biochem 703</td>
<td>25</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Biochem Courses</td>
<td>Credits</td>
<td>Semesters</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------</td>
<td>---------</td>
<td>-----------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>Robert Landick</td>
<td>Biochem 612</td>
<td>75</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 916</td>
<td>15</td>
<td>I</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 701</td>
<td>20</td>
<td>I</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>John Markley</td>
<td>Biochem 801</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thomas Martin</td>
<td>Biochem 630</td>
<td>75</td>
<td>3</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 916</td>
<td>15</td>
<td>I</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 701</td>
<td>20</td>
<td>I</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Julie Mitchell</td>
<td>Biochem 906</td>
<td>8</td>
<td>I</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Math 608</td>
<td>4</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>David Nelson</td>
<td>Biochem 507</td>
<td>275</td>
<td>3</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 508</td>
<td>270</td>
<td>3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 289</td>
<td>25</td>
<td>I-3</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>James Ntambi</td>
<td>Biochem 901</td>
<td>16</td>
<td>I</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 501</td>
<td>900/year</td>
<td>3</td>
<td>22/year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CALS 375</td>
<td>17</td>
<td>2</td>
<td>International Experience</td>
<td></td>
</tr>
<tr>
<td>David Pagliarini</td>
<td>Biochem 508</td>
<td>200</td>
<td>3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 901</td>
<td>20</td>
<td>I</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td>George Phillips</td>
<td>Biochem 636</td>
<td>11</td>
<td>2</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 915</td>
<td>25</td>
<td>I</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 729</td>
<td>12</td>
<td>3</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 711</td>
<td>25</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 660</td>
<td>15</td>
<td>I</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chem 872</td>
<td>15</td>
<td>I</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alternate Years</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alternate Years</td>
<td></td>
</tr>
<tr>
<td>J. Wesley Pike</td>
<td>Biochem 501</td>
<td>900/year</td>
<td>3</td>
<td>22/year</td>
<td></td>
</tr>
<tr>
<td>Ronald Raines</td>
<td>Biochem 704</td>
<td>21</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 704</td>
<td>29</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chem 641</td>
<td>20</td>
<td>3</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>Ivan Rayment</td>
<td>Biochem 710</td>
<td>28</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 601</td>
<td>75</td>
<td>2</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 909</td>
<td>12</td>
<td>I</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td>M. Thomas Record</td>
<td>Biochem 565/665</td>
<td>125</td>
<td>4</td>
<td>58</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 872</td>
<td>5</td>
<td>1</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>George Reed</td>
<td>Biochem 625</td>
<td>9</td>
<td>2</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 624</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 909</td>
<td>15</td>
<td>I</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td>Alessandro Senes</td>
<td>Biochem 651</td>
<td>87</td>
<td>3</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 375</td>
<td>19</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Douglas Weibel</td>
<td>Biochem 651</td>
<td>91</td>
<td>3</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MSE 900</td>
<td>25</td>
<td>I</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 375</td>
<td>40</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Phys 207</td>
<td>30</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBE 562</td>
<td>25</td>
<td>I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marvin Wickens</td>
<td>Biochem 660</td>
<td>25</td>
<td>2</td>
<td>organizer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 799</td>
<td>15</td>
<td>I</td>
<td>seminar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biochem 703</td>
<td>25</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 17

2009 & 2010 Newsletters
Cover and Table of Content

For the complete newsletter please see separate attached file

or

go to

The 34th Steenbock Symposium entitled:

The Metabolism of Lipids: Implications in Human Diseases

will be held at the University of Wisconsin-Madison, May 22-25, 2011. This symposium is hosted by the Department of Biochemistry at the University of Wisconsin-Madison and is organized by James Ntambi.

The symposium will bring together leading scientists to present and discuss their research on the roles of lipids in health and disease. Participants and speakers will reflect international excellence in this medically relevant area of science, and a balance between youth and wisdom.

Lectures will cover a broad range of topics, including:

- brain function
- adipokines
- lipokines
- lipid droplets
- lipolysis
- adipocyte differentiation
- nuclear receptors
- liver steatosis
- insulin signaling
- atherosclerosis
- inflammation

The approaches are very broad, using genomics, proteomics, lipidomics and metabolomics in a wide variety of in vitro and in vivo strategies.

The 35th Steenbock Symposium entitled:

Advances in Biomolecular NMR

will be held at the University of Wisconsin-Madison, June 27-28, 2011 to honor the career of John L. Markley, Steenbock Professor of Biomolecular Structure, Department of Biochemistry, University of Wisconsin-Madison. Through his service to the NMR community and leadership of the National Magnetic Resonance Facility at Madison (NMRFAM), the Biological Magnetic Resonance Data Bank (BMRB) and the Center for Eukaryotic Structural Genomics, Professor Markley has made enormous contributions to the field of biomolecular NMR.

The Symposium will have presentations from leaders in the field of biological NMR spectroscopy and in various fields of biochemistry who collaborate on protein structure-function studies with Professor Markley and NMRFAM. Topics will include applications of NMR spectroscopy to study the dynamics and structure-function relationships of proteins and nucleic acids, high-throughput structure determination, metabolomics, and natural products. A poster session will provide those attending the symposium an opportunity to present their recent work in biological NMR spectroscopy.

For more information on either symposia please go to:

http://steenbock.biochem.wisc.edu
### Appendix 18

**Biochemistry 2012-2013 Committees**

<table>
<thead>
<tr>
<th>Committee</th>
<th>Chair/Officer in Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Animal Care Committee</strong></td>
<td>Margaret Dame, Chair</td>
</tr>
<tr>
<td></td>
<td>James Ntambi</td>
</tr>
<tr>
<td></td>
<td>Wes Pike</td>
</tr>
<tr>
<td><strong>Apparatus Committee</strong></td>
<td>Bob Landick, Chair</td>
</tr>
<tr>
<td></td>
<td>Sam Butcher</td>
</tr>
<tr>
<td></td>
<td>Tom Martin</td>
</tr>
<tr>
<td></td>
<td>Ron Raines</td>
</tr>
<tr>
<td><strong>Art Committee</strong></td>
<td>Alan Attie, Chair</td>
</tr>
<tr>
<td></td>
<td>Colleen Hayes</td>
</tr>
<tr>
<td></td>
<td>John Markley</td>
</tr>
<tr>
<td></td>
<td>Laura Bond, Molly McDevitt, Ellen Crummy*</td>
</tr>
<tr>
<td><strong>Awards Committee</strong></td>
<td>Judith Kimble, Chair</td>
</tr>
<tr>
<td></td>
<td>Aseem Ansari</td>
</tr>
<tr>
<td></td>
<td>Alan Attie</td>
</tr>
<tr>
<td></td>
<td>Laura Kiessling</td>
</tr>
<tr>
<td></td>
<td>Ann Palmenberg</td>
</tr>
<tr>
<td><strong>Biophysics Instrumentation Committee</strong></td>
<td>Ron Raines, Officer in Charge</td>
</tr>
<tr>
<td><strong>Chair’s Advisory and Long-Range Planning Committee</strong></td>
<td>Betty Craig, Chair</td>
</tr>
<tr>
<td></td>
<td>Rick Amasino</td>
</tr>
<tr>
<td></td>
<td>Mike Cox</td>
</tr>
<tr>
<td></td>
<td>Brian Fox</td>
</tr>
<tr>
<td></td>
<td>Judith Kimble</td>
</tr>
<tr>
<td></td>
<td>Bob Landick</td>
</tr>
<tr>
<td></td>
<td>Tom Martin</td>
</tr>
<tr>
<td></td>
<td>Ron Raines</td>
</tr>
<tr>
<td><strong>Computer /Media Lab/Website Committee</strong></td>
<td>Sam Butcher, Chair</td>
</tr>
<tr>
<td></td>
<td>Brian Fox</td>
</tr>
<tr>
<td></td>
<td>Julie Mitchell</td>
</tr>
<tr>
<td></td>
<td>Wes Pike</td>
</tr>
<tr>
<td></td>
<td>Sean Johnston*</td>
</tr>
<tr>
<td><strong>International Committee</strong></td>
<td>James Ntambi, Chair</td>
</tr>
<tr>
<td></td>
<td>Aseem Ansari</td>
</tr>
<tr>
<td></td>
<td>Marv Wickens</td>
</tr>
<tr>
<td><strong>Newsletter Committee</strong></td>
<td>Marv Wickens, Officer in Charge</td>
</tr>
<tr>
<td><strong>Non-Faculty Academic Staff and Fellowships Committee</strong></td>
<td>W. W. Cleland, Chair</td>
</tr>
<tr>
<td></td>
<td>Alan Attie</td>
</tr>
<tr>
<td></td>
<td>Mike Sussman</td>
</tr>
<tr>
<td></td>
<td>Marv Wickens</td>
</tr>
<tr>
<td><strong>NMR Instrumentation Committee</strong></td>
<td>John Markley, Officer in Charge</td>
</tr>
<tr>
<td><strong>Postdoctoral training Committee</strong></td>
<td>Bob Landick, Chair</td>
</tr>
<tr>
<td></td>
<td>Mike Sussman</td>
</tr>
<tr>
<td></td>
<td>Marv Wickens</td>
</tr>
<tr>
<td><strong>Safety Committee</strong></td>
<td>Ron Raines, Chair</td>
</tr>
<tr>
<td></td>
<td>Ivan Rayment</td>
</tr>
<tr>
<td></td>
<td>Doug Weibel</td>
</tr>
<tr>
<td><strong>Seminar and Symposium Committee</strong></td>
<td>Sam Butcher, Chair</td>
</tr>
<tr>
<td></td>
<td>Laura Kiessling</td>
</tr>
<tr>
<td></td>
<td>Dave Pagliarini</td>
</tr>
<tr>
<td></td>
<td>Jill Wildonger</td>
</tr>
<tr>
<td></td>
<td>Graham Erwin*</td>
</tr>
<tr>
<td><strong>Undergraduate Committee</strong></td>
<td>Sebastían Bednarek, Chair</td>
</tr>
<tr>
<td></td>
<td>Rick Amasino</td>
</tr>
<tr>
<td></td>
<td>Alessandro Senes</td>
</tr>
<tr>
<td></td>
<td>Doug Weibel</td>
</tr>
<tr>
<td></td>
<td>Teaching staff: Kelley Harris, Lynne Prost, James Hardy</td>
</tr>
<tr>
<td></td>
<td>Christine Bradford &amp; Kelly Stecker*</td>
</tr>
</tbody>
</table>

*Student/Postdoc Representative*
IPiB committees

**Steering Committee**
Ivan Rayment, Chair  
Mike Cox  
Dave Brow#  
Margaret Dame#  
Paul Friesen#,  
Jim Keck #  
Tricia Kiley  
Loren LaPointe*

**Admissions and Recruiting Committee**
Jim Keck #, Chair  
Doug Weibel, Vice-chair  
Jon Audhya  
Tricia Kiley  
Dave Pagliarini  
Tom Record  
Shruti Waghray & Hillary St. John*

**New Student Orientation Committee**
Paul Friesen#, Co-chair  
Mike Sheets, Co-chair  
Melissa Harrison  
Hazel Holden  
Erin Ronayne*

**Examination and Certification Committee**
Rick Amasino, Co-chair  
Dave Brow #, Co-chair

**Student-Faculty Liaison Committee**
Margaret Dame#, Co-chair  
John Denu, Co-chair  
Alessandro Senes  
Loren LaPointe*, Chair  
Ben Mueller*, Vice-Chair/Secretary  
Virginia Kincaid & Andrew Reidenbach*, SocialChairs/Treasurer

Ad Hoc IPiB committees

**Graduate Teaching Assignment Committee (GTAC)**
Sebastian Bednarek, Chair  
John Denu  
Alessandro Senes

**Curriculum Review Committee**
Hazel Holden, Chair  
Anjon Audhya  
James Keck  
David Pagliarini  
Ron Raines  
Nicole Beauchene*  
David Zhang*

# Committee Chair Representative  
*Student Representative
Ad hoc Departmental Committees

Future of NMR Committee
Brian Fox, Chair
Sam Butcher
Ron Raines

Future of Biophysics Facility (BIF)
Bob Landick, Chair
Aaron Hoskins
Ron Raines

Tenure Advisory Committee for
Douglas Weibel
Ron Raines, Chair
Nicholas Abbott§
Bob Landick
Marv Wickens
Laura Kiessling, Mentor, ex officio

Tenure Advisory Committee for
Alessandro Senes
Ivan Rayment, Chair
John Markley
Julie Mitchell
Mike Sussman
Brian Fox (Mentor), ex officio

Tenure Advisory Committee for
Dave Pagliarini
Tom Martin, Chair
Brian Fox
Wes Pike
Marv Wickens
Alan Attie (Mentor), ex officio

Tenure Advisory Committee for
Aaron Hoskins
Marv Wickens, Chair
Aseem Ansari
Sam Butcher
Mike Cox
Bob Landick (Mentor), ex officio

Tenure Advisory Committee for
Jill Wildonger
Tom Martin, Chair
Margaret Clagett-Dame
Barry Ganetzky§
Ivan Rayment
Judith Kimble (Mentor), ex officio

§nonBiochem member
## Biochemistry 2012-2013 Committees

### BIOCHEMISTRY FACULTY SENATORS
*2011 - 2013*

<table>
<thead>
<tr>
<th>Senator</th>
<th>Alternate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brian Fox</td>
<td>Hazel Holden</td>
</tr>
<tr>
<td>Paul Friesen</td>
<td>Judith Kimble</td>
</tr>
<tr>
<td>Colleen Hayes</td>
<td>Robert Landick</td>
</tr>
</tbody>
</table>

* The length of term is three years.
ANIMAL CARE COMMITTEE

A. Take responsibility for the functioning of the animal rooms and ensure compliance with State, Federal and University regulations regarding the use of animals.

B. Recommend to the Chair the allocation of animal room space and facilities.

APPARATUS COMMITTEE

A. Provide the Chair with an overview of departmental equipment needs and redundancies.

B. Make recommendations to the Chair for the purchase of departmental equipment and the use of designated departmental WARF funds to acquire equipment.

C. Proactively seek funds for departmental equipment, including organizing and encouraging faculty to write grants to fund large equipment.

ART COMMITTEE

Make recommendations to the faculty regarding display of art work, photographs, and other materials in the Biochemistry facilities.

AWARDS COMMITTEE

Gather information on awards and aggressively nominate faculty for appropriate awards.

BIOPHYSICS INSTRUMENTATION COMMITTEE

Oversee the Biophysics Instrumentation Facility and its use.

CHAIR'S ADVISORY AND LONG-RANGE PLANNING COMMITTEE

A. Consider all long-range plans for the department and bring recommendations to the faculty.

B. Advise the Chair on any problems developing in the department.

C. Advise the Chair on space and remodeling issues.

D. Serve as a financial advisory committee.

E. Serve as the advisory board in determining faculty salary increases.

F. Carry out post-tenure reviews of faculty mandated by the Board of Regents.
G. Consider and make recommendations to the Chair and faculty as to how WARF funds will be utilized.

H. Consider and make recommendations to the Chair and faculty as to how WARF funds will be divided between inventors and the faculty.

COMPUTER/MEDIA LAB/WEBSITE COMMITTEE

A. Determine computing needs at the departmental level.

B. Advise the Chair on issues concerning the media/computing lab, particularly forecasting future needs.

C. Design, maintain, and monitor information contained on the departmental website. Check for accuracy and appropriateness. Make recommendations to the Chair/Faculty regarding policy to govern the website and its links.

NON-FACULTY ACADEMIC STAFF AND FELLOWSHIPS COMMITTEE

A. Evaluate nominations for departmental fellowships.

B. Administer the poster session for the Department.

C. Administer student travel awards.

D. Evaluate and make recommendations regarding nominations for Assistant, Associate, and Senior Scientist positions.

E. Make recommendations regarding all non-faculty academic staff matters to the faculty.

NMR INSTRUMENTATION COMMITTEE

Determine policy and manage the NMR facility.

POSTDOCTORAL TRAINING COMMITTEE

A. Evaluate and make recommendations regarding postdoctoral fellowships and awards.

B. Make recommendations to the faculty concerning all postdoctoral matters.

C. Pursue funding opportunities to support postdoctoral activities.
SAFETY COMMITTEE

Make recommendations to the chair and faculty regarding safety issues in the department.

SEMINAR AND SYMPOSIUM COMMITTEE

A. Consider the overall seminar program for the department and make recommendations.

B. Administer Biochemistry Colloquium.

C. Administer Contemporary Biochemistry by appointing appropriate members, both on this faculty and in other departments, for organizing each series.

D. Make recommendations to the faculty for Contemporary Biochemistry topics.

E. Recommend to the faculty possible Steenbock lecturers and host them during their visit.

F. Make recommendations to the faculty for Steenbock Symposia.

G. Make recommendations to the faculty for Everson Lecturers.

UNDERGRADUATE COMMITTEE

A. Examine the course and curriculum structure for undergraduates and make recommendations to the faculty.

B. Make recommendation to the Chair regarding faculty teaching duties.

C. Be the primary advisory committee for the undergraduate population.

D. Administer the summer fellowship program and other funds to support undergraduate research.

E. Determine policies and oversee function of the teaching laboratory.

F. Aggressively seek any means to improve laboratory teaching.
IPIB COMMITTEES

IPIB STEERING COMMITTEE

A. Oversight of IPIB program and policy recommendations for approval by two departmental faculties.

B. Confirmation of thesis laboratory assignments.

C. Oversee development of programmatic initiatives that will foster interaction among faculty and students in the program.

D. Oversee development of IPIB curriculum. In addition, a Biochemistry faculty member of the steering committee will be responsible for review and submission of Biochemistry graduate course-related issues such as cross-listing, credit changes, etc.

E. Take responsibility for all other issues related to the program that are not dealt with by other committees.

IPIB ADMISSIONS & RECRUITING COMMITTEE

A. Deal with all matters associated with applications for advanced degrees in biochemistry.

B. Deal with all matters associated with the recruitment of PhD students to the IPiB graduate program.

C. Recommend to the faculty any changes in admissions policies or procedures.

D. Seek all means, including funding, to better improve IPIB’s competitive position in attracting the most outstanding graduate students.

IPIB NEW STUDENT ORIENTATION COMMITTEE

A. Assume responsibility for organizing the orientation program for incoming graduate students and the major professor selection process.

B. Recommend final assignment of students to major professors.

IPIB EXAMINATION AND CERTIFICATION COMMITTEE

A. Ensure students are effectively tracked through the program for timely completion of the requirements

B. Advise students on course selection.
IPIB STUDENT-FACULTY LIAISON COMMITTEE

A. Serve as a liaison between faculty and students, concerning the wishes, concerns and problems of the graduate student population.

B. Promote educational and social interaction amongst students in the program.

IPIB GRADUATE TEACHING ASSIGNMENT COMMITTEE

A. Determine teaching assignments for Biochemistry and Biomolecular Chemistry courses.
Post-Tenure Review Procedures
Department of Biochemistry

The Department of Biochemistry annually reviews its faculty with the express purpose of awarding merit salary increases. The process involves soliciting from faculty members all information regarding grant support, teaching evaluations, papers published, and services performed, including outside activities at the national level. Since this is done on an annual basis, the department proposes to retain these documents and, at the indicated time, five years of these documents will be used for review of performance. The faculty member should also provide a current CV and a brief summary of career plans for the future.

Beginning in 1994, the department proposes to review approximately 1/5 of its post-tenure faculty, starting with the most senior members, so that each tenured faculty member will be reviewed once within a 5-year period. A letter shall go to the faculty members being evaluated to request any additional information deemed important by the faculty member being reviewed. The Chair’s Advisory and Long-Range Planning Committee of the Department of Biochemistry will carry out the review process. At least two members of the committee will be responsible for reviewing in detail each faculty member. One of the committee members so assigned will draft a brief report describing and evaluating the performance of the faculty member in question. If deficiencies are noted, the report may also include recommendations on ways of improving performance. Once the committee approves the written material, it will be given to the faculty member for comment. The comments will be considered by the committee and the final review will be forwarded by the Chair to the Dean of the College of Agricultural and Life Sciences. A copy will also be provided to the faculty member involved. Faculty members being promoted from Associate to Full Professor will be automatically included in the group of faculty to be reviewed that year and the review conducted in connection with their promotion will substitute for the report by the Post-Tenure Review Committee.

Finally, starting in 2004, the Provost’s office required that a process be established for review of faculty salaries on a periodic basis. This salary review will be completed once every 5 years as part of the post-tenure review process.