Teaching and Research at a Primarily Undergraduate Institution

Melanie Berkmen
Associate Professor, Chemistry & Biochemistry
Suffolk University
Boston, MA
What is my job?
Associate Professor
Department of Chemistry and Biochemistry
Teaching – 3/2 “load”
(5 courses/year)
Teaching is a lot more than lecturing

- Write learning objectives
- Prepare class activities
- Design syllabus
- Design homework
- Post materials online
- Write quizzes & exams
- Office hours
Supervising undergrad research

- Expected to supervise ~2 students/year
- More than just a research advisor
- Really critical to organize well
Research expectations

- 1-2 senior thesis / year
- 2-4 student posters / year
- 1 poster or talk of mine own / year
- 1 internal grant / year
- 1 publication / few years
- 1 external grant / few years ????
Undergrad research grants

- NSF-RUI (Research at Undergraduate Institutions)
- NSF-Career (Faculty Early Career Development)
- NIH AREA (Academic Research Enhancement Award) R-15
Service

- Departmental
- College of Arts and Sciences
- University
- Scientific Community
- General Community
What is my typical day?
Really depends…
Seasonal work

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemistry I</td>
<td>General Chemistry I Lab</td>
<td>Research</td>
</tr>
<tr>
<td>Biochemistry I lab</td>
<td>Biochemistry II Lab</td>
<td>Research</td>
</tr>
<tr>
<td>Biotechnology (for nonmajors)</td>
<td>Research</td>
<td>Vacation</td>
</tr>
</tbody>
</table>
Typical School Day (9am-5pm)

<table>
<thead>
<tr>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
</tr>
<tr>
<td>Prep for class</td>
</tr>
<tr>
<td>TEACH CLASS</td>
</tr>
<tr>
<td>Revise / post lecture notes</td>
</tr>
<tr>
<td>Lunch &amp; email</td>
</tr>
<tr>
<td>Honors committee</td>
</tr>
<tr>
<td>Supervise undergrad research</td>
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<tr>
<td>(or grade)</td>
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</table>
What are the advantages of my job?
Mentoring and changing lives
2014 Gallup poll examined factors that help graduates enter a fulfilling career track\(^1\)

a. Type of university – private/public, small/large
b. The selectivity of the university
c. The prestige of the university
d. An encouraging mentor
e. A long-term project
f. An internship

\(^1\) 2014 Gallup-Purdue University study of college graduates
“How you got your college education mattered most”

d. An encouraging mentor

e. A long-term project

f. An internship

2Brandon Busteed, Executive director of Gallup’s education division
Advantages
What are the drawbacks?
"If only I had a few more papers to grade" said no teacher ever.
Constant hard deadlines

Due tomorrow:
- Write minutes from last Faculty Senate Meeting
- Write Exam 3 for Biochem
- Prepare 1 hour lecture for Biotech
- Write Michelle’s recommendation letter
## Salaries

<table>
<thead>
<tr>
<th></th>
<th>Public Univ</th>
<th>Private Univ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistant Prof</td>
<td>69K</td>
<td>63K</td>
</tr>
<tr>
<td>Associate Prof</td>
<td>80K</td>
<td>73K</td>
</tr>
<tr>
<td>Full Prof</td>
<td>109K</td>
<td>94K</td>
</tr>
</tbody>
</table>

Data from Chronicles of Higher Educ, 2016
http://chronicle.com/article/What-TenuredTenure-Track/235857
How did I get my job?
How did I get my job?

- B.S. Biochemistry
  - Univ. of Dayton (a PUI)
    - TA’d

- Ph.D. Cell and Molecular Biology
  - UW-Madison!
    - TA’d
    - ILSE Education Group

- Postdoc
  - MIT
    - Taught a class
    - HHMI Education Group
How to get a PUI job NOW?
PUI’s are not a back-up plan or consolation prize.
How to get a PUI job NOW?

• Postdoc
  Publications
  Recommendation letters

• A suitable research plan for undergrads

• Real teaching experience

• Great mentors
Suitable research plan

• Cheap
• Safe
• Feasible
• Niche
• Bite-sized chunks
• Writing the research plan
  • Significance
  • Explain without jargon
Real teaching experience REQUIRED

T.A.

Take a class on teaching

Guest lecture

Adjunct teach 1-2 courses

Research/teaching postdoc

One year visiting professor
Avoid adjuncting forever

"The adjuncts want benefits? Weren’t the magnets with our school logo enough?"
Great mentors

Thank you:

**Rick Gourse (UW)**
Tamas Gaal
Wilma Ross

**Alan Grossman (MIT)**
Graham Walker
Cathy Lee

Joan Slonczewski
Thank you!

Any Questions?
Tenure track jobs disappearing

Join an education club

HHMI Education Group

Goal 1: Training Scientist-Educators
- Teaching Assistants for Introductory Biology
- Advanced Undergraduate Seminars
- Teaching Opportunities
- Thinking, Learning, and Talking about Education

Goal 2: Improving Biology Teaching
- Active Learning: In-class Experiments, Voluntary Lab Component, Wearable Genetics Game
- Using Technology: Presentation of images in lecture, Protein Viewing Program, Animations
- Pedagogy: Biology Concept Framework, Personalized Problem Sets

Activities for Teachers:
- High School Teacher Summer Workshop
- HHMI DVD Project

Activities for Students:
- Biology Olympiad
- Science Field Trip to MIT

Outreach Activities:
- Education Conferences
- Journal Club
- Special Seminars
- Education Group Meetings
Do they match?

Resources & teaching requirements

Research expectations
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<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>Teach students technique</td>
</tr>
<tr>
<td>Email</td>
</tr>
<tr>
<td>Help students – research</td>
</tr>
<tr>
<td>Lunch with colleague to plan linked lab curriculum</td>
</tr>
<tr>
<td>Edit student poster / lab meeting</td>
</tr>
<tr>
<td>Plan cloning / order primers</td>
</tr>
<tr>
<td>Order chemicals / organize lab</td>
</tr>
<tr>
<td>Plan research for next day</td>
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</table>
Disadvantages: Change in academia
MEDIAN BASE SALARIES FOR CHEMISTS

Base salaries for academic chemists lagged behind those for other fields

All chemists
$93,000

Industry
$102,000
Government
96,000
Academia
70,500

Bachelor’s
$73,000
Master’s
$83,000
Ph.D.
$101,000

Male
$98,000
Female
$75,600

Bachelor’s
Industry
$75,000
Government
66,685
Academia
54,750

Master’s
Industry
$90,000
Government
79,600
Academia
56,000

Ph.D.
Industry
$115,000
Government
107,000
Academia
73,338

NOTE: Median annual base salaries for chemists with full-time employment.
SOURCE: ACS salary survey 2008