The Khorana Program

University of Wisconsin-Madison
The Khorana Program

Objectives

1. Provide students with a transformative international experience

2. Contribute to Rural development, sustainable agriculture, food security

3. Foster Innovative partnerships between academia, public and private sectors
Initiated with the support of Mr. Kapil Sibal
Minister of Human Resource Development
Former Minister of Science & Technology
Summer Research Internships for Undergraduates

Place Indian students in research laboratories at the University of Wisconsin-Madison (UW)

• 10 -12 weeks in summer
• Experience research with international lab teams
• Join top US undergrads on NSF programs
• Learn about technology transfer
• Tour Wisconsin and Chicago

Place UW students in partner universities in India
Progress Report

~60 students/4 years

Expanding to 75/year

First
Khorana Scholars
Symposium

We would like to invite you to the First Khorana Scholars Symposium featuring the work of fourteen Khorana Scholars. The scholars have been working this summer in leading University of Wisconsin laboratories across a wide-array of disciplines and are excited to share their findings with you.

The presentations will take place on:
Thursday, July 24
from
10 A.M. TO 3:30 P.M.
at
Biochem 175
(Biochemistry Addition -1998 wing, 433 Babcock Drive)

The Khorana program started last summer with the exchange of students and scholars between select Indian institutions and the University of Wisconsin-Madison. The program also envisions applied research that benefits rural/agricultural development in India. A third leg of the program would place students and scholars in internships with appropriate industries both in the US and in India.

To learn more about the Khorana Program, please visit our website at
http://www.biochem.wisc.edu/faculty/ansari/khorana_program/
with support from UW, CALS & Department of Biochemistry

Steenbock Symposium

In July of this year, 100 investigators from across the globe converged on Madison in honor of Gobind Khorana, to participate in a symposium entitled Synthetic Genes to Synthetic Life. The breadth of topics was astounding, from organic synthesis to gene networks and cell signaling. Many of the lecturers either worked with, collaborated with, or were inspired by Gobind Khorana. Gobind's presence in the front row of the auditorium was inspirational, and led to the synthesis of very different fields into a broad arc of biology and chemistry.

If you'd like to learn more about the talks go to http://steenbock33.biochem.wisc.edu

Khorana Auditorium

In honor and appreciation of Har Gobind Khorana, the main seminar room in the 1998 Addition has been christened the Khorana Auditorium. A plaque (right) adorns the wall in the East Atrium, immediately outside the auditorium. Professor Khorana worked here as a member of the Biochemistry Department and Enzyme Institute from 1960 to 1970. During that period he chemically synthesized a gene for the first time (marking the inception of the field of Synthetic Biology). Prior to that landmark achievement, he received the Nobel Prize in 1968 for deciphering the universal genetic code. We are grateful for Gobind's many contributions to the department and campus, both scientific and personal.
The Khorana Program

Objectives

1. Provide students with a transformative international experience

2. Contribute to Indian rural development

3. Increase interaction between the Indian and US scientific communities in academia and the private sector
Rural Development

$1 million USAID -PIKA grant benefitted over 30,000 women’s self help groups and rural farmers over three years -slated to impact nearly 350,000 rural families

(-adapted from USAID “success stories”)
Dairy in Uttar Pradesh (Amethi) with Rajiv Gandhi Charitable Trust
Establishing Soil Testing Labs

• Working with Mahindra & Mahindra

• Establishing 150 soil testing labs throughout the country
President Obama’s introduction to the KHORANA Program in India
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• “Just five schools, in fact, constitute the elite of the technology transfer world. They are Berkeley, Caltech, MIT, Stanford, and Wisconsin.”

(Inc. Magazine, February, 2006)
WARF
Wisconsin Alumni Research Foundation

• Started by CALS faculty ~100 years ago to reinvest research royalties in the UW research enterprise

• Manages over 1700 U.S. patents on UW-Madison technologies, as well as 2,300 foreign equivalents; offers more than 1,000 technologies for licensing

• Maintains 460 academic and commercial licenses on human embryonic stem cells

• Holds equity in 40 UW-Madison spin-off companies

• Gives UW over $50 million to seed new research each year
UW Research Park: 114 companies
The University of Wisconsin-Madison was selected by the Department of Energy to create one of three national bioenergy labs.

- Competition among all top US university
- The only university selected— the other two centers will be based at DOE labs
Phase III of the Khorana Program

Partnerships with other US Universities
(comparable to Fulbright program)

Global innovation platforms via academia & industry partnerships

Sustainability

Continual engagement of new high impact areas
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The Khorana Program of Scientific Exchange

University of Wisconsin-Madison
Message from Dr. Khorana

Dear Friends,

I have looked forward to receiving and reading the Annual Biochemistry Departmental Newsletter over the years. Following my recent very enjoyable visit to Madison, I wish to contribute a few words to the newsletter. I came to Madison to attend the 33rd Steenbock Symposium organized by Dr. Aseem Ansari of the Department and Uttam RajBhandary of the Massachusetts Institute of Technology in my honor and for the dedication of the beautiful Khorana Biochemistry Auditorium. These acts of kindness by the Department and the University and from the Governor's office in conferring the honorary citizenship of Wisconsin were truly overwhelming. The Steenbock Symposium was a tremendous success in the breadth of topics covered by a stellar group of speakers. I also enjoyed meeting the Khorana interns and learning more about the exchange program initiated by Dr. Ansari, Dean Shapiro, and the University administration.

Visits to Madison always bring back fond memories of my days at the Enzyme Institute with colleagues David Green, Henry Lardy, and Helmut Beinert, walks along the lake shore with Julius Adler, a sense of excitement of the early days of Molecular Biology, interactions and discussions with a most collegial group of faculty colleagues in the Biochemistry department and the University at large, and a helpful and a supportive University administration. It was a pleasure to see the department thriving and the University going through such a building boom. While Babcock Hall and Fred Hall have been replaced by spectacular buildings, it was good to see Linden Drive and the beautiful Observatory Drive as I remembered them.

After sixty-two years of work, I closed my laboratory about two years ago with the hope for a quieter life. However, in addition to the naming of this year's Steenbock Symposium and the departmental auditorium in my honor, acts of kindness from friends and institutions have continued. The University of British Columbia dedicated the Khorana Park and The Royal Society of Chemistry in London has named a biennial award for outstanding research in the Chemistry/Biology interface after me. I am honored and humbled by these acts. I am grateful for all the help and support that I have had from my friends in Madison and from colleagues, who have been with me in my scientific journey spanning India, England, Switzerland, Canada, the University of Wisconsin and the Massachusetts Institute of Technology.

I wish you all success and good health.

Gobind
A century of innovation and discovery

- Discovery of the first vitamin, Vitamin A: Elmer McCollum, 1912
- Genetic recombination and the organization of genetic material: Joshua Lederberg, Nobel Prize 1958
- First chemical synthesis of a gene: Har Gobind Khorana, Nobel Prize, 1968
- Reverse transcriptase enzyme: Howard Temin, Nobel Prize, 1975
- Gene knockouts in mouse models: Oliver Smithies, Nobel Prize 2007
- First cultivation of human embryonic stem cells: James Thompson, 1998; and creation pluripotent stem cells from skin cells, 2007.
UW Agricultural Program Rankings in Faculty Productivity Survey

(Source: Chronicle of Higher Education, 11/16/07)

• Plant Science    1
• Animal Science    1
• Food Science      1
• Plant Pathology   2
• Entomology        3
### Leader in R&D spending 2006 ($million) source: NSF

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<th>Rank</th>
<th>University</th>
<th>Spending</th>
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<tr>
<td>1</td>
<td>Johns Hopkins*</td>
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<td>(*includes $709 m. defense research at the Applied Physics Lab mainly under a US Navy contract)</td>
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Babcock Institute

• Training workshops in US and host countries
• Production research
• Marketing research
• Policy analysis
• CDs and manuals for self instruction in multiple languages