



# The Khorana Program

Promoting Scientific Cooperation between India  
and the United States

## Summer 2011

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## Mission

The mission of the Khorana Program is to build a seamless community of scientists, industrialists, and social entrepreneurs in the U.S. and India. The program honors Har Gobind Khorana who won the Nobel Prize in 1968 while a member of the UW faculty. The Khorana Program is focused on three key objectives:

- Providing students with a transformative experience abroad.
- Engaging partners in rural development and food security.
- Facilitating public-private partnerships between U.S. and India.



Professor Aseem Ansari  
Co-Director, Khorana Program



Professor Kenneth Shapiro  
Co-Director, Khorana Program






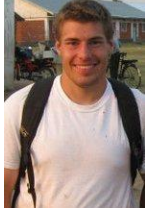
## 2011 Khorana Scholars


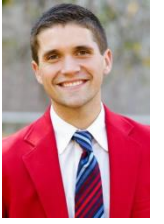





The 2011 Khorana Scholars recently completed a 10-week summer research program at the University of Wisconsin-Madison and at research institutions throughout India. Each Indian scholar was placed in a UW research laboratory with a UW faculty member. Likewise, UW students were matched with research facilities in India to complete a research project under the mentorship of a faculty member. The experience is transformative at many levels!

To view videos of the 2011 Khorana Scholars presenting their research at the 5<sup>th</sup> Annual Khorana Symposium please visit:

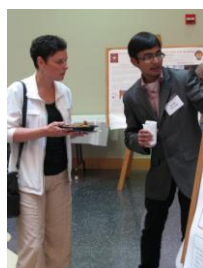
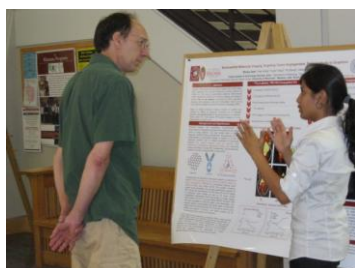
<http://www.youtube.com/playlist?list=PL72FF55BB2A91BE6F>

## 2011 Scholars

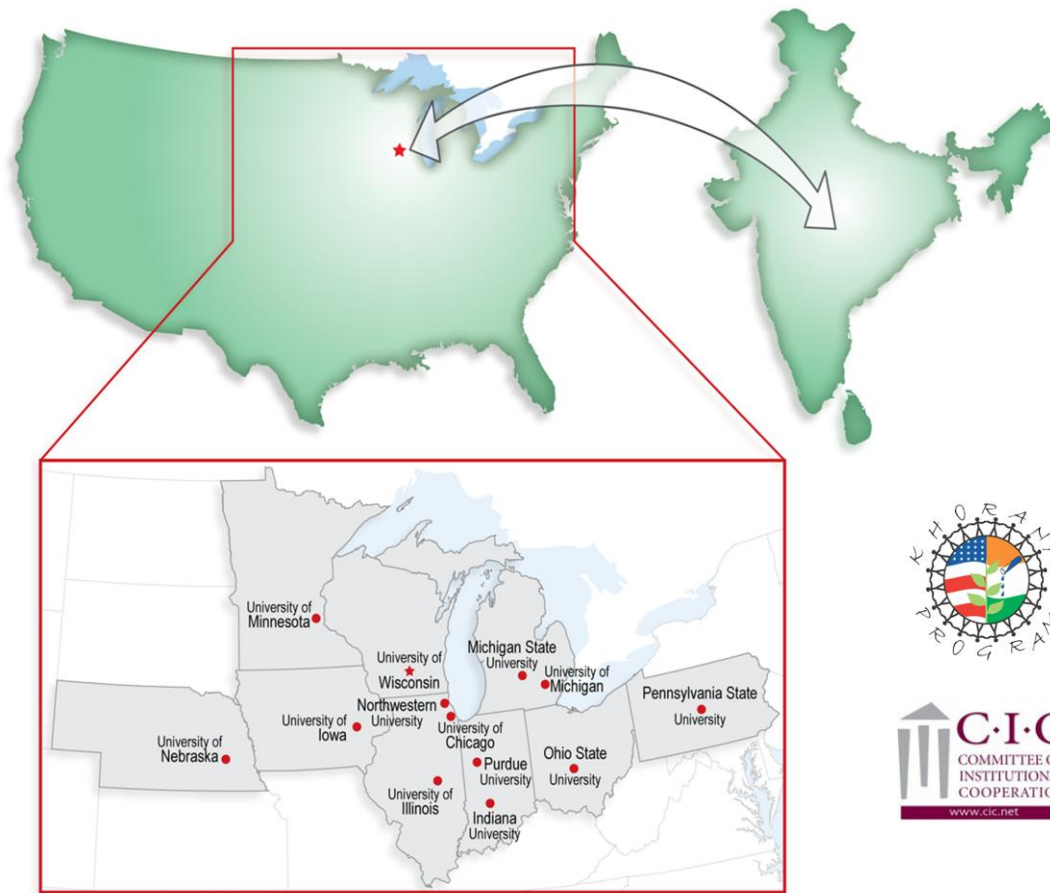
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|    | <p><b>Alokanda Ray</b><br/> <b>National Institute of Science Education and Research, Bhubaneswar</b><br/>         Advisor: Thomas Martin<br/>         Department: Biochemistry</p> <p><i>Studying the effects of mutations in the Munc Homology Domain of calcium activated protein for secretion (CAPS)</i></p> |
|    | <p><b>Amrit Praharaj</b><br/> <b>National Institute of Technology, Rourkela</b><br/>         Advisor: Robert Nowak<br/>         Department: Electrical and Computer Engineering</p> <p><i>Efficient structure learning of gene networks</i></p>  |
|    | <p><b>Benjamin Knollenberg</b><br/> <b>University of Wisconsin-Madison</b><br/>         Advisor: Vijay Raghavan<br/>         National Center for Biological Sciences, Bangalore</p> <p><i>Developmental neurobiology of animal movement</i></p>  |
|   | <p><b>Bhuvan Molparia</b><br/> <b>Indian Institute of Technology, Delhi</b><br/>         Advisor: Julie Mitchell<br/>         Department: Mathematics and Biochemistry</p> <p><i>Studying the effect of RMSD values on prediction of protein flexibility</i></p>   |
|  | <p><b>Bikas Kumar Arya</b><br/> <b>Indian Institute of Technology, Kharagpur</b><br/>         Advisor: Meyer Jackson, Michele A. Basso<br/>         Department: Physiology and Neuroscience</p> <p><i>Cable analysis of superior colliculus neurons and its morphological characterization</i></p>               |
|  | <p><b>Devika Salim</b><br/> <b>National Institute of Technology, Calicut</b><br/>         Advisor: Aseem Ansari<br/>         Department: Biochemistry</p> <p><i>Deciphering the 'CTD code' via chemical genomics</i></p>   |
|  | <p><b>Drew Birrenkott</b><br/> <b>University of Wisconsin-Madison</b><br/>         Advisor: Dipankar Chatterji<br/>         Indian Institute of Science, Bangalore</p> <p><i>Studying various aspects of the GCC protein found mainly in the intestinal tract</i></p>  |

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|     | <p><b>Ipshta Zutshi</b><br/> <b>Birla Institute of Technology &amp; Science, Pilani</b><br/> Advisor: Ronald. E. Kalil<br/> Department: Neuroscience</p> <p><i>Nestin-expressing cells in the third ventricle of the adult rat brain</i></p>  |
|    | <p><b>Kevin King</b><br/> <b>University of Wisconsin-Madison</b><br/> Advisor: Dr. Neeta D. Sinnappah-Kang<br/> Christian Medical College, Vellore</p> <p><i>Tumorigenesis, neuronal and cancer stem cell pathobiology, MicroRNAs, prognosis and diagnosis markers, brain tumors</i></p>                                |
|    | <p><b>Komal Soni</b><br/> <b>Delhi Technological University, Delhi</b><br/> Advisor: John Markley<br/> Department: Biochemistry</p> <p><i>Investigating interactions of bacterial CyaY with other macromolecules in biogenesis of Fe-S Cluster</i></p>  |
|   | <p><b>Lauren Ostrenga</b><br/> <b>University of Wisconsin-Madison</b><br/> Advisor: Dr. Balasubramanian<br/> LV Prasad Eye Institute, Hyderabad</p> <p><i>Comprehensive patient care, sight enhancement, rehabilitation services and high-impact rural eye health programs</i></p>                                      |
|  | <p><b>Rishi Raj Trivedi</b><br/> <b>Indian Institute of Science Education and Research, Mohali</b><br/> Advisor: Mohali Baron Chanda<br/> Department: Neuroscience</p> <p><i>Characterization of hydrophobic residue substitution in the voltage gated K<sup>+</sup> Ion channels using voltage clamp technique</i></p> |
|  | <p><b>Shreya Goel</b><br/> <b>Indian Institute of Technology, Roorkee</b><br/> Advisor: Weibo Cai<br/> Department: Radiology and Medical Physics</p> <p><i>Development of novel PET tracers based on Graphene and TRC105 antibody.</i></p>  |
|  | <p><b>Shreyas Rangan</b><br/> <b>Indian Institute of Technology, Madras</b><br/> Advisor: Richard Vierstra<br/> Department: Genetics</p> <p><i>Determining the role of the BTB E3 ubiquitin ligase family in Arabidopsis thaliana</i></p>   |

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|     | <p><b>Shriya Rangarajan</b><br/> <b>National Institute of Technology, Warangal</b><br/> Advisor: Caroline Alexander<br/> Department of Oncology</p> <p><i>Characterization of the HC11 cell line</i></p>   |
|    | <p><b>Smruthi Vijayaraghavan</b><br/> <b>Anna University, Chennai</b><br/> Advisor: Norman Drinkwater<br/> Department: Oncology</p> <p><i>Identification of the Chr 17 liver cancer susceptibility modifier in C57BR/cdJ mice</i></p>  |
|    | <p><b>Swati Venkat</b><br/> <b>Indian Institute of Science Education and Research, Pune</b><br/> Advisor: Dr. Robert Striker<br/> Department: Medical Microbiology and Immunology</p> <p><i>The effect of the C terminal domain of Hepatitis C Virus non-structural protein NS5A on viral life cycle</i></p> |
|   | <p><b>Uma Maheswari Selvaraj</b><br/> <b>Indian Institute of Technology, Madras</b><br/> Advisor: Laura Kiessling<br/> Department: Chemistry</p> <p><i>Scaffold-based approach for neural differentiation of human embryonic stem cells</i></p>  |
|  | <p><b>Umair Wajid Khan</b><br/> <b>Institute of Bioinformatics and Biotechnology, University of Pune</b><br/> Advisor: Michael Cox<br/> Department: Biochemistry</p> <p><i>The role of SSB in homologous recombination catalyzed by RecA in Deinococcus radiodurans</i></p>                                  |
|  | <p><b>Vivek Dwivedi</b><br/> <b>Indian Institute of Technology, Delhi</b><br/> Advisor: Jennifer Reed<br/> Department: Chemical and Biological Engineering</p> <p><i>Incorporating thermodynamics into an existing model of the metabolic pathways in E. coli</i></p>  |



# Khorana Program Expands To CIC Universities



The Committee on Institutional Cooperation (CIC) represents the Big 10 Universities plus the University of Chicago. This committee is devoted to optimizing a student's college experience through academic collaboration and by facilitating the development of innovative partnerships and programs. With the success of the Khorana Program at the University of Wisconsin-Madison, it is an ideal time to expand to CIC partners.

In 2012, up to 80 Indian scholars selected in a national competition will spend research summers at CIC universities; similar numbers of American scholars will spend research summers in India. The number of participating students is expected to double during the next five years. Indian hosts currently include the National Centre for Biological Sciences (Bangalore), the Indian Institute of Science (Bangalore), AstraZeneca (Bangalore), LV Prasad Eye Center (Hyderabad), and Punjab Agricultural University (Ludhiana). We hope to expand to more Indian partners in the coming years.

The Khorana Program has opened doors for many students from both the United States and India. The Khorana Parivar (family) is excited to spread its wings and further provide U.S. and Indian scholars with a transformative educational and cultural experience.

# Rural Development Initiative in India

Wisconsin's strength in basic science research is complemented by its long-standing excellence in the agricultural sciences.

Since March 2008, the Khorana Program has worked closely with the Rajiv Gandhi Charitable Trust (RGCT) (dairy) and Mahindra and Mahindra (soils) to deliver knowledge based rural development to India. Armed with a USAID grant, we worked with Mr. Rahul Gandhi and separately with Mr. Anand Mahindra to bring leading dairy and soil scientists to India.



U.S. President Barack Obama commenting on the Khorana Program and the work of John Peters



Dairy training with the Rajiv Gandhi Charitable Trust



Demonstration plots for soil testing with The Agricultural Consultancy Management Foundation near Chennai



Khorana Program co-directors Dr. Aseem Ansari and Dr. Ken Shapiro

Working with the Mahindra group, John Peters, a UW soil scientist, spent two years establishing nearly 100 state-of-the-art labs in rural India. These services have reduced the inappropriate use of fertilizers and improved crop productivity by almost 100%. Further success came when several UW scientists worked with the RGCT in the poorest state of India, positively impacting approximately 50,000 women self-help groups through the development of agricultural and dairy training resources ([http://www.usaid.gov/in/about\\_us/pdfs/ss\\_pika.pdf](http://www.usaid.gov/in/about_us/pdfs/ss_pika.pdf)). This amounts to impacting nearly 200,000-250,000 individuals. The visiting scientists helped double the agricultural and dairy productivity of many of the sub-marginal farmers on low-yielding land. The lessons learned are now being extended to nearly 350,000 women in self-help groups -in effect, reaching over a million individuals in the poorest part of the world.

## Tech Transfer & Public / Private Partnerships

New! The University of Wisconsin–Madison is among America's leading research universities in science and technology. In a recent partnership with the Wisconsin Alumni Research Foundation (WARF) and the Indian Department of Biotechnology (DBT), UW-Madison initiated the development of a Tech Transfer Program for top policy makers from government agencies and academia. Further information on this program will be available soon.

Successful collaborations with groups like Mahindra and Mahindra encourage the Khorana Program to initiate further public and private partnerships between scientific communities in the United States and India - both academic and industrial.

# Alumni Corner

## Discussion with Khorana Alumni



**Do you feel your experience on the Khorana program affected you while entering the work place?**

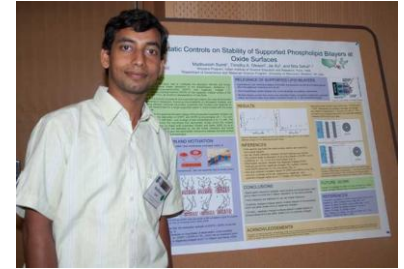
*Definitely! Not only did the Khorana program give me lab experience outside the typical on-campus lab jobs, but it gave me experience living in a professional environment in a foreign country. I now realize that I can bring new ideas to the table due to my diverse background.*

### Lauren Marinaro

Khorana 2010  
Graduated from UW-Madison  
Currently working for the  
Aventi Group, San Francisco

**Would you recommend the Khorana Program to other students?**

*Yes! It was the most exhilarating experience of my life. I went sky diving twice, I met people who I now consider to be my best friends, and I hope to make it back to India soon.*



*The Khorana program enhanced my resume more than I could have asked for. Every graduate school interview I had wanted to know more about my internship experience.*

*I would 110% recommend the Khorana Program. The experience I had with the girls I went there with and the students in my lab was incredible. It was fascinating to learn in a completely different culture and I was exposed to students from all over the world.*



### Erica Barts

Khorana 2010  
Graduated from UW-Madison  
Currently pursuing a Masters of Nursing at UW-Milwaukee

*I strongly recommend the Khorana Program to fellow Indian students. This program is very unique. Not only do you have the opportunity to work in an excellent lab, but you learn how to approach research like a scientist rather than a technician. Dr. Aseem Ansari and Dr. Ken Shapiro took a very active interest in how we shaped our summer research to present it to the esteemed UW-committee. You are not without guidance for even a moment. For anyone planning to specialize in Biology, this program is a bridge between your undergraduate and graduate research experiences.*



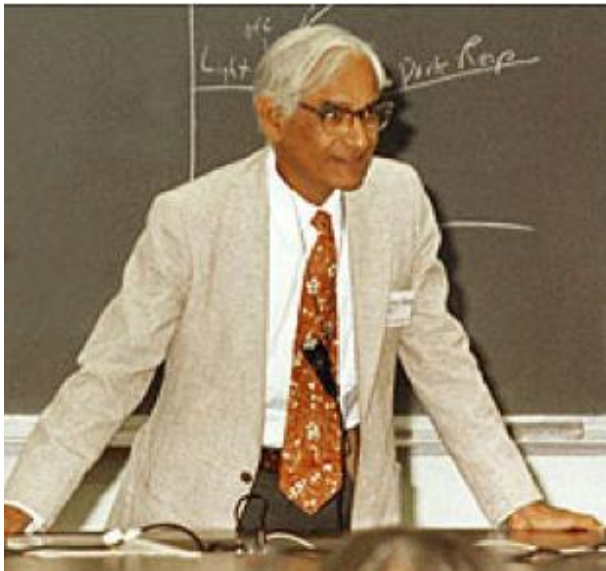
### Aayushi Uberoi

Khorana 2010  
Graduated from SRM University  
Currently pursuing a PhD in Cancer Biology at UW-Madison



## Reflecting on the Khorana Parivar

*"The moments of cheer by the Lakefront, at the Union Terrace or at Babcock Dairy meant much more than some bright young minds having the time of their lives. It provided a perspective both in terms of the diversity of the group of my Khorana Program batch-mates, and also in terms of finding like minds."* Jishnu Das, Khorana 2009



**“ I remember very vividly the encouragement I received from the University of Wisconsin, Madison and I'm truly happy to have my name associated with the program.”**

## Support for Khorana Program

How can you help ensure the continued success of the Khorana Program?

The Khorana Program leadership is working to identify grants that may be applicable for certain program elements, such as specific rural development projects. We also look to private donors and corporations for that ongoing margin of excellence that can make the Khorana Program truly extraordinary and a fitting tribute to a great scientist shared by two countries. Those wishing to become contributing Friends of the Khorana Program are encouraged to contact the co-directors, Aseem Ansari ([ansari@biochem.wisc.edu](mailto:ansari@biochem.wisc.edu)) and Kenneth Shapiro ([kshapiro@cals.wisc.edu](mailto:kshapiro@cals.wisc.edu)) or UW-Madison program coordinator Karen Lovely ([krlovely@wisc.edu](mailto:krlovely@wisc.edu)).

## The Khorana Program for Scientific Exchange

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