

HIGHLIGHTS FROM THE 2009 KECK ANNUAL RESEARCH CONFERENCE: **Computation in biology: From gene to neuron**

The Keck Center, the training arm of the Gulf Coast Consortia (GCC), currently administers ten training programs with 93 predoctoral and postdoctoral trainees.

For more information about Keck Center training programs and GCC Research Consortia, please see www.gulfcoastconsortia.org

A record-breaking 249 Keck fellows and faculty, as well as Houston-area biomedical researchers gathered in October at the Keck Center's 19th Annual Research Conference (ARC), "Computation in Biology: From Gene to Neuron." Seventy-seven Ph.D. students and postdoctoral fellows supported by the ten training grants administered by the Keck Center, along with 30 other scientists from the Houston area, presented their research results in two poster sessions. The fellows, their mentors, and other biomedical researchers attended research presentations by distinguished scientists from across the country.

The scientific lectures focused on computation in biology at the genomic, proteomic,



cellular and system level. Conference Co-Chairs Steve Cox and Lydia Kavvaki, both of Rice University, welcomed attendees and gave an overview of the Keck Center, the training arm of the Gulf Coast Consortia.

The featured Keynote Speaker was **Phil E. Bourne** (above left), Professor of Pharmacology, UC San Diego, Associate Director of the Protein Bank, and founding editor of PLoS Computational

Biology.

Plenary speakers included: **Manolis Kellis**, Associate Professor of Computer Science, MIT;

Mona Singh (in picture at left), Associate Professor of Computer Science, Princeton University;

Liam Paninski, Associate Professor of Statistics, Columbia University;

Jonathan Pillow, Assistant Professor of Psychology and Neurology, UT Austin; and

Ilya Schmulevich, (below),

Associate Professor, Institute for Systems Biology, Seattle.



GCC / Keck Center Member Institutions



RESEARCH POSTER WINNERS AT KECK ARC



Poster Winners (left to right): **Ana Maria Cardenas**, **Ben Bammes**, and **Sergio Iadevaia**.

A focal point of the Keck Center ARC is the poster presentation and competition. Judges and guest speakers

were highly complimentary of all 107 posters and presenters.

Poster Session 1 winners: Predoc: **Todd L. Mollan**, Rice

University (RU); Postdoc: **Sergio Iadevaia**, fellow in Pharmacoinformatics, UTMDACC; People's Choice: **Ben Bammes**, fellow in Houston Area Molecular Biophysics Program, BCM.

Poster Session 2 winners: Predoc: **Lina Mountziaris**, fellow in Nanobiology, RU; Postdoc: **Diana Yoon**, fellow in Nanobiology, RU; People's Choice: **Ana Maria Cardenas**, fellow in Biomedical Discovery from Large Scale Data Sets, BCM.

NEW KECK CENTER GRANT FOCUSES ON NANOBIOLOGY

The intersection of nanotechnology with biology promises to yield significant advances for diagnostics and therapeutics. Conventional approaches from the molecular level or the more macroscale level do not extrapolate well to the nanoscale, where unique phenomena are frequently encountered. Thus, to capitalize on the promises from these new technologies, unique interdisciplinary graduate training is needed. This new training grant, the Nanobiology Interdisciplinary Graduate Training Program (Program Director:

Jennifer L. West, Rice University; Program Co-Directors: **Ananth Annapragada**, UT Health Science Center at Houston, and **B. Montgomery Pettitt**, University of Houston), has joined the Keck Center's eight other training grants.

This five-year grant, funded by the National Institute of Biomedical Imaging and Bioengineering (one of the 27 institutes and centers within the National Institutes of Health), provides funding for eight graduate fellows who are U.S. citizens or Permanent Residents. The first call for

applications went out in late November 2009. For information and requirements, please contact Melissa Glueck at the Keck Center, glueck@rice.edu.

Trainees are required to have two mentors from two different areas among the following: Imaging, Modeling, and Bionano Materials. This program develops a new type of experienced interdisciplinary scientist in the field of nanobiology, combining the tools, ideas and materials of nanoscience with biology to enable new approaches to research problems and

develop novel diagnostic and therapeutic strategies.

Trainees from this program will be uniquely prepared to explore the interplay between current nanoscience applications in high technology and biotechnology, and biomedical applications for clinical and research medicine. Just as early molecular biology heralded a new era in both biological sciences and technology, nanobiology is poised to exploit the adventurous interface between nanoscience and biology.

\$1M RECOVERY ACT AWARD FOR NLM BIOMEDICAL INFORMATICS



NLM trainees: front row from left: Mary McGuire, Deepa Ramachandran, Eva Dyer, Serkan Erdin, Jonathan Starkey. Middle row from left: Brian Kirk, Gerda Saxer, Elizabeth Jones, Lola Coker, & Stephen Jones. Back row from left: Nasos Dousis, Christian Ray, and Caleb Davis.

The Keck Center's 18-year-old NLM Biomedical Informatics Training Program has been awarded more than \$1 million under the American Recovery and Reinvestment Act (ARRA), creating seven new predoctoral and three postdoctoral trainee slots, which will offer support for two years. These slots are in addition to the 14 regularly funded slots.

PI **Tony Gorry**, Rice Univer-

sity, has been active in a field that has developed and changed rapidly over the past twenty years due to Internet access to research repositories and advances in molecular biology.

"When a handful of us, including **Kathy Matthews** from Rice and **Wah Chiu** from Baylor, began thinking about this initiative, most of what was called bioinformatics was

in applications for computers in hospitals. We committed ourselves to the integration of training in fundamental biology with training in mathematics and computer science. It was a risky grant proposal, but it won—and it has since proved to be a foundation of the Keck Center," Gorry said. "I think it's commonly accepted that there is seldom biology without computation today."

This strategy has paid off in three grant renewals and now the new ARRA-funded slots.

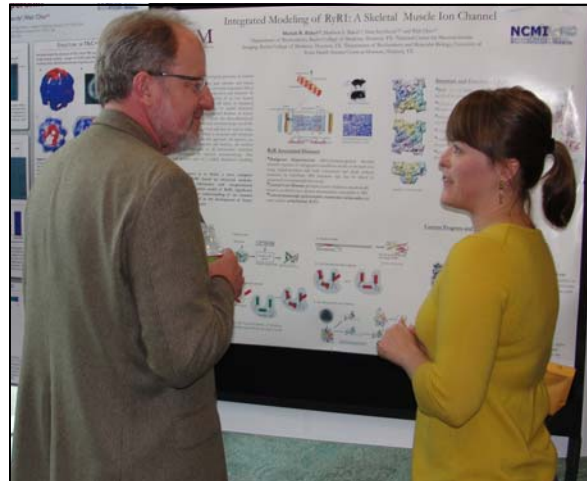
"I believe the size of the award is indicative of the excellence of our program. Our hope is to produce elite people who are very strongly grounded in bioinformatics, but also have an interest in and an ability to apply their knowledge to this very complex domain of health care. This supplement grant lets us

train people who will take everything that's been learned and bring it into the health care system to make what I hope will be radical change."

Biomedical informatics is the use of information systems to improve biomedical research and clinical care. Encompassing both basic biological sciences and clinical sciences, it applies statistical and computational methods to biological and biomedical data in order to improve disease prevention and treatment, and to analyze problems in public health care systems and in clinical patient care. Examples of research include the analysis and development of effective and secure electronic medical records, mathematical models of the cardiopulmonary system, and data mining of genomic data.

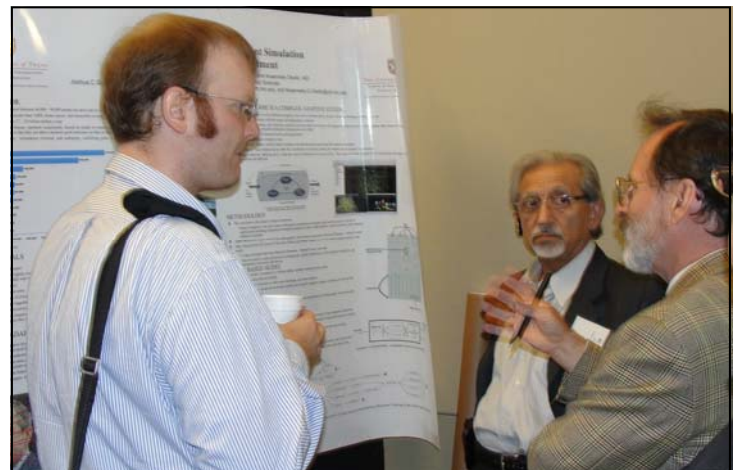


Left: Ketan Ghaghada, UTHSC-H, Nanobiology, awaits poster judging. Right: Mona Singh, Princeton, and Olivier Lichtarge, BCM, share research interests. Below left: John Weinstein, M. D. Anderson Cancer Center (left), listens as Paul Ledbetter, RU, Nanobiology, explains his research.



Above center: Norbert Herzog, UT Medical Branch at Galveston, and Mariah Baker, BCM, NLM Biomedical Informatics training program, discuss her poster. Above right: Andria Denmon, RU, Houston Area Molecular Biophysics Program, is eager to present her research.

Below left: Monte Pettitt, UH, (left), and Joaquin Ambia, UH, touch base during the networking break. Below right: Caleb Goodwin, UTHSC-H, Patient Safety and Quality training program (left), takes questions from faculty during the poster session.



The co-mentorship opportunity facilitated through the Computational and Structural Biology in Biodefense Training Program opened new avenues of research that I was unable to obtain previously. Adding structural biology to my background in microbiology and molecular genetics has enabled my work to impact more biological problems. In addition, I thoroughly enjoyed interacting with researchers at other universities through the many Keck Center events. The value of my interactions with so many other fields will be fully realized in the future as I continue to discover the great benefits of interdisciplinary science.

– Troy Hammerstrom, Trainee 2006-2008,
Computational and Structural Biology in Biodefense,
Graduate Student at UT Health Science Center

GULF COAST CONSORTIA/ KECK CENTER

INTERDISCIPLINARY
BIOSCIENCE
RESEARCH + TRAINING

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Amy Jackson, Grant Programs Asst. Director
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*where science and
the future intersect*

We're moving!

The GCC's home, as of late January 2010, will be in Rice University's 10-story BioScience Research Collaborative (BRC). The BRC, containing laboratories, meeting facilities, administrative offices, and classrooms, further enables GCC and TMC researchers, physicians, scientists, and engineers to team up and complement one another's capabilities. A LEED-certified "green" building at the corner of University Blvd. and Main St., the BRC has a 280-seat auditorium, underground parking, and will soon have a coffee bar. The GCC's website, email addresses and telephone and fax numbers will remain the same.

SAVE THE DATE!

Sealy Structural Biology Symposium,
March 19, 2010, Galveston, TX
Keck Annual Research Conference,
October 2010, Houston, TX

Keck Center Training Programs

*Biomedical Discovery from
Large Scale Datasets*

*Computational Biology and
Biomedical Informatics*

*Computational and Structural
Biology in Biodefense*

*Houston Area Molecular
Biophysics Program*

Nanobiology

*NSF REU in Theoretical and
Computational Neuroscience*

Patient Safety and Quality

Pharmacoinformatics

*Theoretical and Computational
Neuroscience*

W. M. Keck Virus Imaging

Gulf Coast Research Consortia

GCC for Bioinformatics

*John S. Dunn GCC
for Chemical Genomics*

*John S. Dunn, Sr. GCC
for Magnetic Resonance*

*Gulf Coast Cluster for
Mathematical Biosciences*

GCC for Membrane Biology

GCC for Protein Crystallography

*GCC for Theoretical and
Computational Neuroscience*

*Gulf Coast Cluster for
Translational Pain Research*

The **Gulf Coast Consortia** (GCC) is an innovative research and education collaboration formed to provide a formal and lasting mechanism for advancing biological sciences in the 21st century. It is comprised of six prominent institutions: Baylor College of Medicine, Rice University, University of Houston, The University of Texas Health Science Center at Houston, The University of Texas M. D. Anderson Cancer Center and The University of Texas Medical Branch at Galveston. GCC is one of the largest inter-institutional co-operatives in the world with a focus on building strong research collaborations that bring together complementary and disparate faculty expertise as well as building multidisciplinary training opportunities for students in the computational, biological, mathematical, physical and chemical sciences. For additional information, please visit the GCC website: www.gulfcoastconsortia.org.