

BIOCHEMISTRY & MOLECULAR BIOLOGY TODAY

FEBRUARY/MARCH 2009 NO. 245



BMB
Biochemistry & Molecular Biology

Chair's Message

Our Department has the policy that one third of the faculty attends the commencement exercises for the medical school students every year. The Department pays for the rental of the graduation outfit if you do not own your own. Please provide the information to Margie, including the name of the University that awarded your advanced degree so as to get the robe particulars right. This year's Graduate School graduation is on May 2nd, and the Medical School graduation is on May 30th. I would encourage all faculty to attend both functions. This has been a hard year for the students as well as for the rest of us, and the best way to show our appreciation for their patience and strength in the face of adversity is simply to show up at this ceremony that is so important to them and their loved ones. They are joyous events, and I always find it a rewarding way to spend a couple of hours with my colleagues. I am a great believer that traditions can provide us with emotional support during difficult times. I hope to see you there.

While on the topic of students, the Biological Chemistry Student Organization (BCSO) does not have a budget this year, and they are appealing to the generosity of the faculty to make contributions to enable them to carry out their mission. They

recently took the initiative with a fundraising event, but still need help. Checks (tax deductible) may be sent to Debora Botting.

From everything we hear, it would appear that both the UT Regents and Texas Legislators are in the process of determining how best to help the recovery effort for UTMB. There are constraints in that efforts off Galveston Island will not have access to FEMA or Sealy Foundation support. Unfortunately, the consultants hired by the State never took this into account in their recommendations; theirs was purely a business bottom-line focus, curious for an academic client serving the health needs of citizens of Texas, with the highest proportion of uninsured citizens in the United States. I am sure our Regents and Legislators will take all of this into account.

On a more upbeat note, on February 25th funded research faculty met to discuss future directions for our UTMB Research Strategic Plan. This is but the first step in a process that will take several months to come to fruition. One goal is to make sure to be inclusive and get input via various venues before coming to the finished product. If you were not invited to the event on the 25th, or could not attend due to previous commitments, there will be

further opportunities to provide input. At the Departmental level, we will also plan for a one day retreat to plan our future. I will wait until we have a Departmental budget to begin that process.

Another piece of good news is that some of our faculty are now beginning to receive FEMA funds for the replacement of reagents lost during Ike. There are some procedures and rules that apply, so be sure to get the right information when you get the letter of award.

It thus appears that things are looking up in general. Again, if you have not talked to your funding agency about extensions and supplements, please do. NIH is receiving its own stimulus package with some funds that are discretionary and must be spent over two years; requests to cover Ike losses should fit that perfectly. If you need help on this matter, contact Toni D'Agostino, who can be a great help.

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Inside this issue:

Graduate Program Notes	2
Faculty Travels	4
Awards and Announcements	2
Featured Abstract by Faculty	6
Publications	4

Special Items of Interest

- [Sealy Center for Structural Biology and Molecular Biophysics Annual Symposium](#)
- [US EU Conference on Endogenous Genome Damage](#)

Graduate Program News



The *Graduate Student Organization* will host **Kickball games and a cookout** for all GSBS students, post docs and faculty on Saturday, March 21st from 11-2p at the UTMB softball field near Ferry Rd. We will have Hamburgers, Hotdogs, Vegi options, Beer, Water & Soda. Teams will be made on Saturday by 11:15am. All families, significant others, and pets are welcome to come! Kickball is fun and easy to play, so please join us!

What: Kickball and Cookout

When: Saturday, March 21st @11-2

Where: Fieldhouse Softball Fields

Cost: Free

*New GSO T-Shirts for \$3

Question: jeborges@utmb.edu



Awards and Announcements

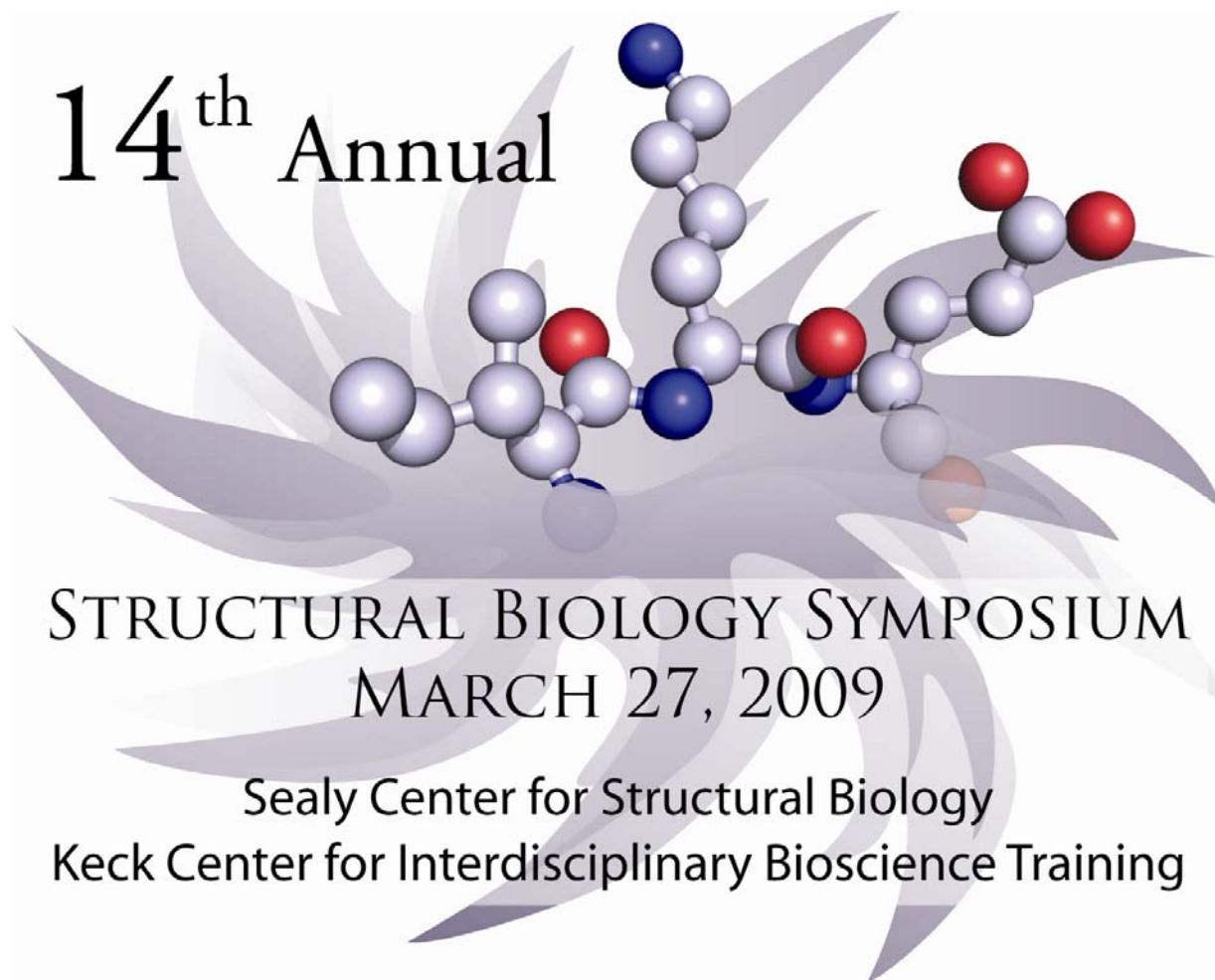
Vincent J. Hilser, Ph.D., Professor, Department of Biochemistry and Molecular Biology and Director, Sealy Center for Structural Biology and Molecular Biophysics, has been appointed as holder of The Charles Marc Pomerat Distinguished Professorship in Biological Sciences, effective February 1, 2009. The endowment was established in 1997 in honor of Dr. Charles Marc Pomerat, a member of the UTMB faculty from 1943-1960. Dr. Pomerat served as Professor of Cytology and Director of the Tissue Culture Laboratory (a facility which he founded) at UTMB. Revered as a scientist, artist, and humanist, Dr. Pomerat pioneered cell cinematography and development of tissue culture as a viable research area during his tenure at UTMB. Congratulations on this well deserved recognition of your accomplishments.

Investigators in BMB and the Sealy Center for Molecular Medicine have been awarded a new grant, "Clinical Proteomics Center for Infectious Diseases" from the NIAID. This center seeks to provide a collaborative resource that supports the discovery, qualification and verification of human protein biomarkers induced by infection with NIAID Category A-C agents and new/emerging infectious agents. Work in the center will include application of a protein biomarker discovery platform that produces quantitative pre-fractionation, 2-dimensional gel electrophoresis (2DE) and tandem liquid chromatography (LC)-mass spectrometry (MS)-based protein identification. Bioinformatics tools will be used to develop predictive models of infectious outcomes that will drive further studies in validation by collaborating investigators. Work in the center will also include development of platforms for biomarker qualification and verification. Interested investigators can submit short pre-proposals that will be developed into full projects upon approval of the scientific working group and NIAID. Preproposals are now being accepted. Visit our web site at <http://bioinfo.utmb.edu:8088/CPC/> for further information.

Dr. Heidi Spratt was selected as [Researcher of the Month](#) for February 2009. She was nominated for her work and her recent K25 award "Biomarker Discovery for Hepatitis C Progression using Machine Learning Techniques."



14th Annual



STRUCTURAL BIOLOGY SYMPOSIUM
MARCH 27, 2009

Sealy Center for Structural Biology
Keck Center for Interdisciplinary Bioscience Training

You and your colleagues are cordially invited to join us for the 14th Annual Structural Biology Symposium to be held at the Hotel Galvez on March 27, 2009. The meeting is organized by the Sealy Center for Structural Biology & Molecular Biophysics and co-sponsored by the Keck Center for Computational & Structural Biology.

Keynote Speaker:

James R. Williamson

The Scripps Research Institute

Please visit our symposium web-site at <http://www.scsb.utmb.edu/symposium/> or contact Angelina Johnson, Phone: (409) 772-8083, Fax: (409) 772-6334 for on-line registration.

Publications

Gribenko AV, Patel MM, Liu J, McCallum SA, Wang C, Makhatadze GI. "Rational stabilization of enzymes by computational redesign of surface charge-charge interactions." Proceedings of the National Academy of Sciences of the USA, 106(8), pp.2601-2606.

James H. DeFord, Jonathan E. Nuss, James Amaning, Robert D. English, Don Tjernlund and John Papaconstantinou. High-Throughput Liquid-Liquid Fractionation of Multiple Protein Post-Translational Modifications. J. Proteome Res., 2009, 8 (2), pp 907-916.

Vascotto C, Cesaratto L, Zeef LA, Deganuto M, D'Ambrosio C, Scaloni A, Romanello M, Damante G, Tagliatela G, Delneri D, Kelley MR, Mitra S, Quadrioglio F, Tell G. [Genome-wide analysis and proteomic studies reveal APE1/Ref-1 multifunctional role in mammalian cells.](#) Proteomics 9: 1058-1074; 2009.

Faculty on the Road



Dr. Kizhake V. Soman attended and presented his work at the US HUPO Fifth Annual Conference – Integrative Proteomics for the Future in San Diego, CA, February 22-25, 2009.

Dr. Werner Braun participated in a EPA Scientific Advisory Panel meeting "Scientific Issues associated with the data required to register plant-incorporated protectants", Feb. 25-27 in Washington, DC.

Dr. J.R. Perez-Polo was a guest lecturer at the Kentucky Spinal Cord Injury Research Center at the University of Louisville, Louisville, KY on February 23-24, 2009. His talk was titled "Anti-inflammatory Treatments of spinal cord injury".

He also gave a talk titled "Thanatos: Understanding Death at the Molecular Level" at UCLA, in Los Angeles, CA, on March 4, 2009.

Dr. Marc Morais was invited to give a seminar at Texas A&M at College Station, on Feb 25th. His talk was titled "Dissecting the Bacteriophage Phi29 DNA Packaging Motor".

Dr. Sankar Mitra traveled to Washington for a Special Emphasis Panel meeting of National Cancer Institute to review Program Project grants on February 4-6, 2009.

Anasuya Roychowdhury attended the Biophysical Society 53rd Annual Meeting in Boston, Massachusetts, February 28 - March 4, 2009, in a Platform Session on Protein Assemblies and Protein Nucleic Acid Complexes. The title of her talk was "Nucleotide Control of Replication Initiation: NTPase Mechanisms of *E.coli* DnaB-DnaC Complex."

ONLINE Research Coordinator's Corner
www.bmb.utmb.edu/department/RCC/

A forum for scientific exchange between US and EU scientists working in the area of endogenous DNA damage and repair and their linkage to diseases was established in 2003 by Vilhelm A. Bohr, Samuel H. Wilson and the late Erling Seeberg. One objective of this series of symposia was to attract young investigators to the field of DNA damage and repair. The 2nd US/EU Conference,



organized by Eugenia Dogliotti and her colleagues, was held in 2005 Erice, Italy. The 3rd conference originally planned for 2007 in Galveston, Texas was postponed until November 5-9, 2008. That original plan was rudely scuttled by Hurricane Ike. The rescheduled meeting was finally held on February 21-25, 2009 at the Moody Gardens Hotel in Galveston and was judged to be a great success by all participants. The Symposium is a testimonial to the resilience of UTMB faculty and Galveston residents in their fast track recovery from the massive destruction due to flooding caused by Ike.

This meeting was possible due to the generous financial support of the School of Medicine and the Department of Biochemistry and Molecular Biology at UTMB. Major support also came from the National Institutes of Health, in particular the National Cancer Institute and the National Institute of Environmental Health Sciences, the Ellison Medical Foundation, and the Sealy Center for Environmental Health and Medicine, UTMB, Thermo Fisher Corporation and Elsevier Publishing (Mechanism of Ageing and Development). We thank Ms. RayKay Santa, Administrative Director of UTMB's NIEHS Center, Ms. Cheryl 'Cheshe' Langford, Editor, and Mr. David Hileman, Administrator of Biochemistry and Molecular Biology, at UTMB for their critical help in preparing for the conference.

Ms. Wanda Smith and Mrs. Lisa Pippet Stephenson, coordinators of this conference, deserve special thanks for their work in the planning, logistics and organization of the meeting.

The Organizing Committee consisted of Sankar Mitra, as the local Convener, along with Samuel H. Wilson (NIEHS), Vilhelm A. Bohr (NIA), Eugenia Dogliotti (Rome, Italy), Hans Krokan (Trondheim, Norway) and Tinna Stevnsner (Aarhus, Denmark). The conference had about 100 participants from U.K., Denmark, France, Germany, Italy, The Netherlands, Norway, Russia, and Japan and various U.S. institutions. Nine travel awards were provided to young investigators from both U.S. and abroad. The conference opened with welcoming addresses by Dr. Garland Anderson, Provost and Dean of the Medical School and Dr. J. Regino Perez-Polo, Chair of the Department of Biochemistry and Molecular Biology. The keynote lectures were given by Drs. Stephen West, Tomas Lindahl (both at Cancer Research, U.K.) and John Tainer (Scripps and Lawrence Berkeley Lab). Nearly fifty talks were presented during the conference, along with two poster sessions with more than 30 posters that included both leaders in the field and young investigators from U.S. and E.U. Some poster presenters were selected for short talks. The conference was wrapped up with a grand banquet in the Aquarium at Moody Gardens.

Featured Abstract by BMB Faculty

Rational stabilization of enzymes by computational redesign of surface charge-charge interactions.

Proc Natl Acad Sci U S A. 2009 Feb 24;106(8):2601-6. Epub 2009 Feb 5.

[Gribenko AV](#), [Patel MM](#), [Liu J](#), [McCallum SA](#), [Wang C](#), [Makhatadze GI](#).

Department of Biology and Center for Biotechnology and Interdisciplinary Studies, Rensselaer Polytechnic Institute, Troy, NY 12180, USA.

Here, we report the application of a computational approach that allows the rational design of enzymes with enhanced thermostability while retaining full enzymatic activity. The approach is based on the optimization of the energy of charge-charge interactions on the protein surface. We experimentally tested the validity of the approach on 2 human enzymes, acylphosphatase (AcPh) and Cdc42 GTPase, that differ in size (98 vs. 198-aa residues, respectively) and tertiary structure. We show that the designed proteins are significantly more stable than the corresponding WT proteins. The increase in stability is not accompanied by significant changes in structure, oligomerization state, or, most importantly, activity of the designed AcPh or Cdc42. This success of the design methodology suggests that it can be universally applied to other enzymes, on its own or in combination with the other strategies based on redesign of the interactions in the protein core.