

BIOCHEMISTRY & MOLECULAR BIOLOGY TODAY

JANUARY 2012 NO. 285



Chair's Message

Happy New Year! We begin the year with the usual statements of commitment to betterment and expectations for improvements in the world around us. Let's hope that in some measure these come to pass.

I want to welcome our new faculty member; Dr. Bernard "Monty" Pettit is a full Professor with tenure in BMB and Director of the Sealy Center for Structural Biology and Molecular Biophysics. Monty brings a unique ability to bring diverse disciplines together, and a vision that fits the interdepartmental nature of the Center. I look forward to working with him as we fill vacant senior positions in our Department.

We are also saying goodbye to Donna Masters, who is retiring after almost 30 years of service to UTMB. We wish her well in her new life.

This is the time of year when we plan our annual Departmental retreat, which will take place in late February or March,

depending on venue availability. A request for suggestions from the faculty will be out shortly. Please make every effort to both provide suggestions and attend this important event.

I trust you all had a restful and merry holiday, and wish for all of us that we may fulfill our resolutions and aspirations.

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Inside this issue:

Awards and Announcements	2
Faculty Travels	2
Graduate Program News	2
Featured Abstract	4
Publications	2

Special Items of Interest

- ✦ Awards and Announcements—Page 2

Awards and Announcements

Dr. Regino Perez-Polo was recently appointed to the Neuroscience section of the Texas Academy of Sciences.

Levani Zandarashvili, a graduate student in Dr. Iwahara's Lab, received a poster award at the GCC Magnetic Resonance Conference held in Houston, December 9, 2011, for his poster entitled "Signature of dynamic hydrogen bonding of lysine side chains from long-range 15N-13C scalar J-couplings and computation."

Dr. Marc Morais received an NIH R01 - 1R01GM095516-01A1 for a grant entitled "The DNA Packaging Motor of Bacteriophage Phi29".



Faculty on the Road

Dr. Kay Choi participated in a NIH/NIAID Scientific Review Panel entitled "Program in Virus Translational Control" on November 17-18.



Publications



Tiwari, R., Negi, S.S., Braun, B., **Braun, W.**, Pomes, A., Chapman, M.D., Goldblum, R.M. and Midoro-Horiuti, T. Validation of a Phage Display and Computational Algorithm by Mapping a Conformational Epitope of Bla_g 2. *Int. Arch. Allergy Immunol.*, 157(4), 323-330, 2012.

Wiktorowicz, J.E., English, R., Wu, Z., and **Kurosky, A.** (2011) Model Studies on iTRAQ™ Modification of Peptides: Sequence-Dependent Reaction Specificity. *J. Proteome Research*, Accepted, 2011.

Proteomic Study of Amyloid Beta (25-35) Peptide Exposure to Neuronal Cells: Impact on APE1/Ref-1's Protein-Protein Interaction. Anil K. Mantha, Monisha Dhiman, Giulio Tagliatela, **Regino J. Perez-Polo**, and **Sankar Mitra**. *J. of Neuroscience Research*. 2012. (In press).

Vincent J. Hilser and **E. Brad Thompson**. Structural Dynamics, Intrinsic Disorder, and Allostery in Nuclear Receptors as Transcription Factors. *J. Biol. Chem.* 2011 286: 39675-39682. First Published on September 21, 2011, doi:10.1074/jbc.R111.278929

Graduate Program News

The Biological Chemistry Student Organization wants to thank everyone that donated to the annual BCSO Toy Drive. The BCSO sponsored 5 children that are currently under the care of Child Protective Services of Galveston County. The drive was a success and we raised \$650! We were able to get wonderful gifts and toys for our goal of \$100 per child.

Approximately \$150 will be donated to the Galveston County Animal Resource Center and Shelter to go towards veterinary care, food, and sheltering costs for the animals. We cannot thank you enough for your generosity every year, and the BCSO would like to wish everyone a Happy Holidays!



Health
Biochemistry and
Molecular Biology

Featured Abstract by BMB Faculty

Structural Dynamics, Intrinsic Disorder, and Allostery in Nuclear Receptors as Transcription Factors

J. Biol. Chem. 2011 286: 39675-39682. First Published on September 21, 2011, doi:10.1074/jbc.R111.278929

[Vincent J. Hilser](#) and [E. Brad Thompson](#)

Steroid hormone receptors (SHRs) and nuclear receptors (NRs) in general are flexible, allosterically regulated transcription factors. The classic model is inadequate to explain all their behavior. Keys to function are their regions of intrinsic disorder (ID). Data show the dynamic structure and allosteric interactions of the three classic SHR domains: ligand-binding (LBD), DNA-binding (DBD), and N-terminal (NTD). Each responds to its ligands by stabilizing its structure. The LBD responds to classic steroidal and nonsteroidal small ligands; both may selectively modify SHR activity. The DBD responds differentially to the DNA sequences of its response elements. The NTD, with its high ID content and AF1, interacts allosterically with the LBD and DBD. Each domain binds heterologous proteins, potential allosteric ligands. An ensemble framework improves the classic model, shows how ID regions poise the SHR/NR family for optimal allosteric response, and provides a basis for quantitative evaluation of SHR/NR actions.

