

# BIOCHEMISTRY & MOLECULAR BIOLOGY TODAY



**JUNE 2012 NO. 287**



## Chair's Message

This is the time of year for commencements, always a happy event, and the more somber time for budget preparations for the Department. It has been several years now since the latter had a positive outcome. Nevertheless, we will do our best to carry out our mission as best we can. We are lucky to have a great faculty and staff, and so far we have always managed. As soon as we know the final details, we will call a faculty meeting to discuss next year's plans.

This is also a good time to make storm emergency plans for both your labs and your homes. Make sure you have cell numbers of all in your staff, and they have yours. I have also recommended in the past having an alternate email address that is not UTMB server-dependent. If you have questions as to either because you have never experienced a hurricane, please contact Lisa Pipper.

One of the key plans waylaid by Hurricane Ike was the development of a Grant Preparation Core. I am happy to announce that in collaboration with the Sealy Center for Structural Biology and Molecular Biophysics and the Departments of Neuroscience and Cell Biology and Pharmacology and Toxicology, Dr. Pettitt is heading a Research Development Core with a group of outstanding individuals. I am sure that this will be a great aid, especially for multi-investigator grant proposals. More details will follow from Monte and our office in the near future as to accessibility and operational details.

I have been told by several investigators that the [Basic Science Weekly](#) has spawned several collaborative efforts. This was its intended goal, and I am happy that it is a success. We have to thank Lisa Pipper for her efforts in providing this tool for all of us. At the present time, we need more submissions to keep the effort going. Please send a photo of yourself and a one-page description of your research interests along with an up-to-date list of your publications that are relevant. It all has to fit in one page. This is important, and also provides a showcase of who we are to the rest of UTMB.

I would also remind you that if you are submitting a grant in the fall, now is the time to arrange for its pre-submission review by our internal Study Section.

If you have not done so this academic year, summer is a good time to take some vacation. Have fun.

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### Special Items of Interest

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## Awards and Announcements

**Dr. Yong Sun Lee** received a Research Scholar Grant: American Cancer Society, "A non-coding RNA's tumor surveillance role in the Protein Kinase R pathway" .

**Dr. Naseem H. Ansari** was awarded a Sealy Center of Aging Pepper Pilot grant, "Role of Aldehyde dehydrogenase in the rehabilitation of sarcopenic skeletal muscle"

**Abhisek Mukherjee**, graduate student in Dr. Fujise's lab was awarded the Dr. and Mrs. Seymour Fisher Academic Excellence Awards in Neuroscience for the poster titled "*Calcineurin Inhibition at the Clinical Phase of Prion Disease Reduces Neurodegeneration, Improves Behavioral Alterations and Increases Animal Survival*".

**Carla Kantara** was awarded the **Best Poster Presentation in Biochemistry and Molecular Biology** at the 53<sup>RD</sup> Annual National Student Research Forum for her poster titled "Prograstrin overexpression imparts tumorigenic potential to embryonic Cells: Role of Annexin A2 and stem cells markers".

**Dr. Alexander Kurosky** received a Clinically Related Research grant from MedImmune to conduct proteomic analysis of peripheral blood eosinophils stimulated *ex vivo* with cytokines implicated in the pathobiology of asthma.

**Keerthi Gottapati**, student in Dr. Kay Choi's lab, was elected an Associate Member by the UTMB Chapter of Sigma Xi scientific society for the year 2012.

She was also awarded the student travel grant to attend the 2012 American Society for Virology 31st annual meeting hosted by the University of Wisconsin-Madison at the Monona Terrace Convention Center, Madison, Wisconsin, July 21-25th.



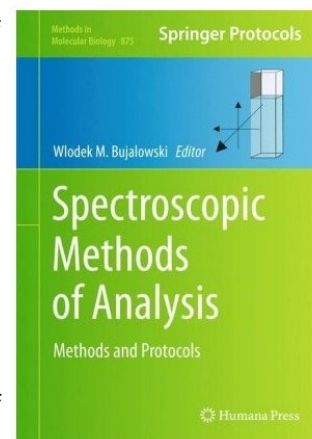
## Spectroscopic Methods of Analysis: Methods and Protocols

Edited by

**Wlodek M. Bujalowski**

The University of Texas Medical Branch at Galveston, Galveston, TX, USA

Quantitative elucidation of structural, energetic and dynamic aspects of macromolecular interactions is indispensable for understanding the functional activities of biomolecules and their interactions. The optical spectroscopic methods are not confined to small molecules or macromolecules but permit the studies of even the largest biological systems in their full splendor, including the living cell. In, *Spectroscopic Methods of Analysis: Methods and Protocols*, expert researchers in the field detail many of the methods which are now commonly used to study properties of individual macromolecules, their complexes, organelles, and cells, using optical spectroscopic techniques. These include methods and approaches for experimental and theoretical analyses of fluorescence properties of the examined systems, single molecule approaches, electronic absorption, and electro-optical analyses of macromolecular interactions, structures, and dynamics.



## Structural Biology Symposium

The 17<sup>th</sup> Structural Biology Symposium, organized by Werner Braun and Xiaodong Cheng on behalf of the Sealy Center for Structural Biology and Molecular Biophysics, was held on Friday, April 27 at the Hotel Galvez in Galveston. More than 250 people attended the symposium, which featured speakers at the forefront of structural biology.

Ada Yonath (Weizmann Institute) gave the keynote address with her talk “Ribosomes, Their Tiny Enemies and Thoughts About Their Origin.” Dr. Yonath (Nobel Laureate in Chemistry 2009) gave a highly educational lively talk on many detailed aspects of the complex ribosome structure and the impact on developing new antibiotics. Her talk also included personal memories on her scientific career. Solving the 3D structure ribosome, although a major breakthrough, required great persistence as many people told her what she was trying to do couldn’t be done. Other speakers included Jane Dyson (Scripps Research Institute), Wim Hol (University of Washington), Nadrian Seeman (New York University), Carol Post (Purdue University) and Monte Pettitt (UTMB), who presented their current research on new techniques in nuclear magnetic resonance, x-ray crystallography and computational chemistry to reveal the 3D structure, dynamics and folding of macromolecules, their mutual interactions with other proteins and solvents. Several talks highlighted how this knowledge can be used to custom-design new compounds for diagnosis and therapy. The symposium fulfills every year an important mission for students and post-docs of the Keck Center for Quantitative Biomedical Sciences from six institutions in the Houston/Galveston area. This year a special student-speaker mixer allowed students and post-docs interact with the speakers in an informal way. As every year students and post-docs showcased their research on many interesting posters and competed for poster awards.

### Post Doctoral Winners:

Hualin Li, UTHSC

Zhenlong Li, UTHSC

Priyanka Prakash, UTHSC

### Student Winners:

Kuang-Yui Chen, BCM

Ian Rees, BCM

Chance Mooney, BCM

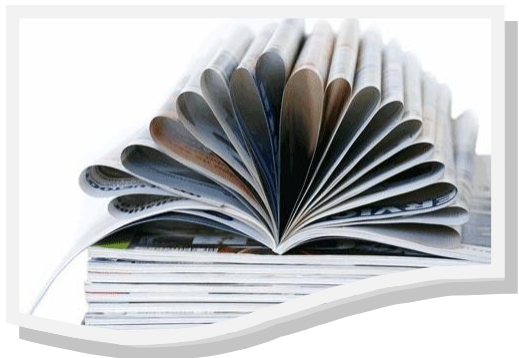


**Hurricane Season  
June 1- December 1**

**ARE YOU PREPARED? DO YOU HAVE A PLAN?**



## Publications



Spencer PS, Barral JM (2012) Genetic code redundancy and its influence on the encoded polypeptides. *Computational and Structural Biotechnology Journal*. 1 (1): e201204006. doi: <http://dx.doi.org/10.5936/csbj.201204006>

Zheng J, Gay DC, Demeler B, **White MA**, Keatinge-Clay AT. Divergence of multimodular polyketide synthases revealed by a didomain structure. *Nat Chem Biol*. 2012 May 27. doi: 10.1038/nchembio.964. [Epub ahead of print]

Pandey S, **Srivastava SK, Ramana KV**. A potential therapeutic role for aldose reductase inhibitors in the treatment of endotoxin-related inflammatory diseases. **Expert Opin Investig Drugs**. 2012 Mar;21 (3):329-39.

**Yadav UC, Srivastava SK, Ramana KV**. Prevention of VEGF-induced growth and tube formation in human retinal endothelial cell by aldose reductase inhibition. **Journal of diabetes and its complications**. 2012 (in press).

Kalariya NM, Shoeb M, **Ansari NH, Srivastava SK, Ramana KV**. Anti-Diabetic Drug Metformin Suppresses Endotoxin-induced uveitis in Rats. **Invest Ophthalmol Vis Sci**. 2012 May 3. [Epub ahead of print].

Jane Robb, Hakeem Shittu, **Kizhake V. Soman, Alexander Kurosky**, and Ross N. Nazar, Arsenal of Elevated Defense Proteins Fails to Protect Tomato Against Verticillium Dahliae, *Planta*, April 6 (2012) Epub ahead of print.

**Choi KH**. Viral polymerases. *Adv Exp Med Biol*. 2012;726:267-304.

## Faculty on the Road

**Dr. Kizhake V. Soman** attended and served as faculty judge at the National Student Research Forum, Galveston, TX, April 26, 2012.

He also attended and served as poster judge at Structural Biology S Symposium, Gaveston, TX, April 27, 2012.

**Dr. Anthony Haag** attended the 2012 ASMS conference in Vancouver Canada May 20-24.

**Dr. Alexander Kurosky** was an invited reviewer for the American Heart Association April 2012.



**Featured Abstract by BMB Faculty**

# Viral Polymerases

**Kyung H. Choi**

**VIRAL MOLECULAR MACHINES, *Advances in Experimental Medicine and Biology*, 2012, Volume 726, Part 2, 267-304, DOI: 10.1007/978-1-4614-0980-9\_12**



Viral polymerases play a central role in viral genome replication and transcription. Based on the genome type and the specific needs of particular virus, RNA-dependent RNA polymerase, RNA-dependent DNA polymerase, DNA-dependent RNA polymerase, and DNA-dependent RNA polymerases are found in various viruses. Viral polymerases are generally active as a single protein capable of carrying out multiple functions related to viral genome synthesis. Specifically, viral polymerases use variety of mechanisms to recognize initial binding sites, ensure processive elongation, terminate replication at the end of the genome, and also coordinate the chemical steps of nucleic acid synthesis with other enzymatic activities. This review focuses on different viral genome replication and transcription strategies, and the polymerase interactions with various viral proteins that are necessary to complete genome synthesis.