

# BIOCHEMISTRY & MOLECULAR BIOLOGY TODAY

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**BMB**  
Biochemistry & Molecular Biology



## Chair's Message

This May brings us a new President of the University, Dr. David Callender. By the time you read this, it is likely that a message conveying a new vision will have been shared with all. I think we all look forward to the stability and opportunities to allow us all to pursue our teaching, research and service mission. In May we also begin the budgeting process that will define our departmental resources for the next academic year. We will keep all informed as to how this develops this year with a new Dean and President.

On May 5, the Graduate School will hold its Commencement exercises. Please try to attend the very important event in the lives of our graduate students. We congratulate three of our students who will receive the Ph.D.: Craig Bush, Song Liu and Rodrigo Maillard. On June 2, the

medical students will graduate. Our Departmental policy is that faculty should attend at least every third year; if it is your turn to attend, please do so. These are joyous events that constitute a significant component of the academic tradition.

Again, on May 18, we will have another [Structural Biology Symposium](#). This annual event has now become an important national meeting, and is an opportunity to enjoy some great science without having to get on an airplane. See you there.

On a more cautionary note, May is a good time to think about the coming hurricane season and preparations for your home and your lab. I have suggested in the past that this might be a good time to share non-UTMB email addresses with members of your research group and our Departmental office. Please let

Mary know. In case the UTMB server is disrupted as a result of a storm, I have a subscription to a personal server. I found this useful last year to keep in touch with my research group. I will not bother to remind all that data should be backed up on a regular basis. If you need suggestions as to how to do this, contact Lisa Pipper and she will offer some alternatives.

If you are planning to submit a grant and would like some help at any level, please contact David Konkel. If you are submitting your first grant and wish to request a "mock Study Section" review, please let me know as early as possible, so we can arrange this in a timely fashion that will be useful.

-regino

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### Special Items of Interest

- Spotlight—Biomolecular Resource Facility, [page 3](#)
- [Dr. Konkel's Research Coordinator's Columns Online](#)
- May 18-19, 2007—12<sup>th</sup> Annual Structural Biology Symposium -[Page 5](#)

## Graduate Program News—BCSO News

On April 12th, the BCSO participated in "Bowling for Kids Sake", a major annual fundraiser for the Big Brothers, Big Sisters mentoring program of Galveston County. The BCSO would like to thank all the people who donated money and helped the BCSO team to raise an amazing \$330+ dollars in less than a week. Following this on the 28th of April, the BCSO organized and sponsored a wonderful group outing to watch the Cirque du Soleil touring production called Corteo.

The BCSO would like to encourage our graduate students to apply for the upcoming National Graduate Student Research Festival, to be held October 11th - 12th, 2007 at the NIH in Bethesda, Maryland. This two-day event allows participants to be directly immersed in the NIH Intramural Research Program and is tremendously helpful to anyone interested in post-doc opportunities at the NIH. Student who are planning to graduate in December 2007, May 2008 or August 2008 are all eligible to apply. Application is due June 1st online at <http://www.training.nih.gov/>.



*Sergio Santa Maria  
carefully inspecting the  
fermentors.*

## Awards and Announcements

A new son, Brendan Dias was born to Dr. Kathleen O'Connor and her husband on April 30. Dr. O'Connor is an Associate Professor in the Departments of Surgery and Biochemistry and Molecular Biology and is also the Director of the Cancer Cell Biology Track in the Neuroscience and Cell Biology graduate program.

**Jittima Weerachayaphorn**, a graduate student in **Dr. Ana Pajor's** lab, has won the student award from the American Physiological society, Cell and Molecular Physiology section. Jittima is a student in the CPMB program.

A paper from Terumi Midoro-Horiuti's lab in Pediatrics, on which **Dr. Cheryl Watson** and several others at UTMB collaborated, was featured on NPR's Saturday morning program Living on Earth. The article is about how environmental estrogens working via nongenomic mechanisms cause the release of asthma mediators and exacerbate release by allergens. It could help explain the increasing incidence of asthma in this country. To hear the program, click [here](#).

**Austin Elam**, a BSCB graduate student, was just awarded a Texas Space Grant Consortium Fellowship. The \$5,000 Fellowship is given in support of the doctoral research proposed by Austin. He competed against students from other universities in the Consortium (UT-Austin, Texas A&M, Univ. of Houston, and Rice) and was one of two students from UTMB that received a Fellowship.

A former student of **Dr. Wlodek Bujalowski**, Roberto Galletto has recently accepted a faculty position in the Department of Biochemistry and Molecular Biophysics at Washington University in St. Louis. This is a significant accomplishment in which Dr. Bujalowski and all of the BMB faculty who were involved in Roberto's training should take pride.

**Robert Malmstrom**, a student in **Dr. Stanley Watowich's** research lab, has been awarded an NIH fellowship. Robert was selected through a competitive process conducted by the Keck Center on behalf of the Gulf Coast Consortia.

## SPOTLIGHT: UTMB BIOMOLECULAR RESOURCE FACILITY – (Part 1)

The Biomolecular Resource Facility (BRF), directed by Dr. Alex Kurosky, is a UTMB designated core facility providing research support targeted to the analysis of biomolecules, especially proteins and peptides. The initial organization of the BRF began in 1975 and the facility has grown considerably over the years to meet the analytical needs of UTMB investigators. The BRF is currently composed of seven core laboratories whose services are briefly outlined below. A more complete description of BRF core laboratory services can be found at [www.utmb.edu/brf](http://www.utmb.edu/brf). The overarching philosophy of the BRF is to provide UTMB biomedical researchers with a relevant menu of analytical services at reasonable cost that will enhance their funded research projects as well as the quality of their publications. Importantly, the BRF puts considerable effort into obtaining major instrumentation too expensive for individual investigators to obtain. Current technologies available in the BRF are at the cutting edge of analytical research and the available instrumentation is state-of-the-art. Investigators are encouraged to interact closely with BRF personnel to obtain maximum benefit of the BRF services. Usage fees in the BRF are maintained at a minimum when compared with other institutions largely due to support from several UTMB Centers, e.g. NHLBI Proteomics Center, NIEHS Center, and the Sealy Center for Environmental Health and Medicine.

In 2002, national recognition was accorded to the UTMB BRF by the awarding of one of ten national NIH/NHLBI "Proteomics Center" awards for seven years (Dr. Kurosky is the Director and Dr. Brasier is the Co-Director). Major activities within the UTMB NHLBI Proteomics Center include the development of innovative technologies to meet the challenges of proteomic research and to conduct proteomic studies relating to the central theme of "Airway Inflammation". Subsequent BMB Spotlight issues will focus on available proteomics technologies at UTMB (Part 2) and Proteomic studies of airway inflammation (Part 3).

Major BRF Services Available to UTMB Investigators:

### 1. Protein Chemistry – Steve Smith, Manager (x 26766)

- a. DNA sequencing
- b. Protein sequencing
- c. Amino acid analysis
- d. Carbohydrate analysis



### 2. Synthetic Peptide Production - Stefan Serabyn, Manager (x 70914)

- a. Fmoc automated solid phase synthesis
- b. Peptide purification
- c. Peptide mass analysis

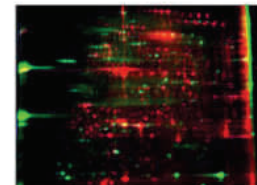
### 3. Protein Synthesis and Biomarkers – Bo Xu, Manager (x 23644)

- a. Biosynthesis of recombinant proteins in bacteria or yeast cultures
- b. Protein purification and characterization
- c. Polyclonal antibody production
- d. SELDI biomarker analysis

*Continued on the next page*

**4. Separation Technologies – John Wiktorowicz, Manager (x 26338)**

- a. HPLC analysis
- b. 1D and 2D gel electrophoreses
- c. Fluorescence gel staining and imaging
- d. Robotic gel spot picking and processing for MS analysis



**5. Mass Spectrometry – Tony Haag, Manager (x 26338)**

- a. MALDI – TOF/TOF MS/MS analysis
- b. Electrospray ionization MS/MS analysis including liquid chromatography (LC/MS/MS)
- c. Peptide mass fingerprint analysis
- d. Post-translational modification identifications
- e. Stable isotope methods (e.g. iTRAQ and <sup>18</sup> O)

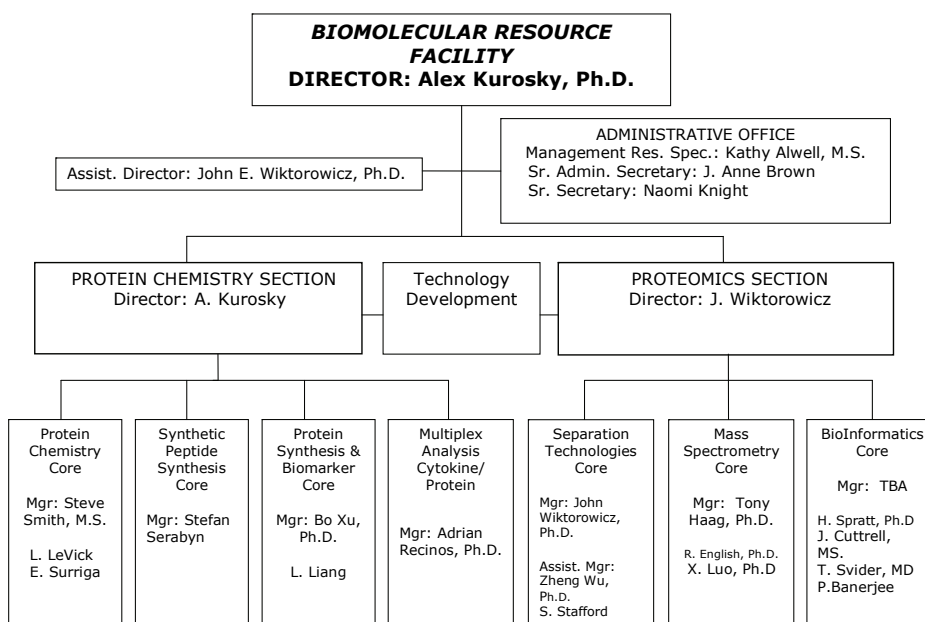
**6. Bioinformatics – Manager, open**

- a. Nonlinear 2D gel analysis
- b. Genomics LIMS for data/sample management and access
- c. Database searching



**7. Multiplex Protein Analysis – Adrian Recinos, Manager (x 22824)**

- a. Bio-rad Bioplex analysis of human, rat, and mouse proteins on Luminex beads
- b. High sensitivity and high throughput analysis comparable to ELISA's
- c. Major analytical focus of Bioplex analysis is on cytokines



## Administrator's Notes

### Upgrade of Fire Alarm System in BSB is in Progress

Extensive updating and expansion of the fire alarm system is currently underway in BSB. Work is currently being performed mostly in the ceilings above the corridors. Through the next several weeks, the contractor will need to have access to certain labs and offices to replace devices such as smoke detectors and strobe light/audible alarms. In some spaces, especially on the 2<sup>nd</sup> floor, new devices will be installed where none currently exist. This work will be arranged to minimize disruption to the occupants of the affected spaces as much as possible.

### Upcoming Transition to New System for Electronic Submission of NIH Grant Proposals

NIH has notified institutions that proposals to be submitted for June deadlines may be sent through the existing system, PureEdge, even though the transition from the PureEdge system to the new AdobeForms systems will begin in mid-May. NIH promises to make the change as smooth as possible. More details will be provided as soon as information is available.

### Important Family Milestones for Two Administrative Staff Members

Two administrative staff members are celebrating their sons' graduation from high school:

- Marcus Griggs, son of Rose Byrdlon-Griggs is graduating from La Marque High School. Marcus was awarded the Tanya Marie Myers Scholarship and plans to attend the University of Houston, combining studies in music with pursuit of a degree in business. Rose is a Senior Administrative Secretary assisting Drs. Yogesh Awasthi, Stanley Watowich, and Junji Iwahara in addition to coordinating important Departmental tasks.

- Kendrell Thompson, son of Rhoda Thompson, is graduating from Clear Lake High School, where he has been a star on the basketball team for three years. During his senior year he was named to the All State and All Star lists, major achievements for young athletes in Texas. Kendrell is beginning his higher education at Collin County Community College, where he has received a basketball scholarship. Rhoda is a Senior Administrative Secretary assisting Dr. E. Brad Thompson and Dr. Wayne Bolen and supporting the Sealy Center for Structural Biology.

## 12th Annual Structural Biology Symposium

The Sealy Center for Structural Biology and Molecular Biophysics (SCSB) again is hosting its annual Symposium, which will be held on **May 18-19, 2007** in Levin Hall. Drs. Braun and Epstein have put together an outstanding slate of speakers for the program, including James A. Spudich, Ph.D., from Stanford, as the Keynote speaker, who will be speaking on the "Regulation of the Cell's Dynamic City Plan and the Myosin Family of Molecular Motors." All details about the program, including the on-line Registration form, can be accessed at:

[www.scsb.utmb.edu/symposium](http://www.scsb.utmb.edu/symposium)

Abstract Submission is now closed, but faculty, staff and students can still register for the symposium and banquet.

This year marks the 12<sup>th</sup> year of the Center's sponsoring the Annual Symposium, with support from the Department of Biochemistry and Molecular Biology and the Keck Center for Interdisciplinary Bioscience Training of the Gulf Coast Consortia. Please direct any questions to Angelina Johnson at: [ajohnson@utmb.edu](mailto:ajohnson@utmb.edu) or 409-772-8083.

## Publications & Grant Awards

### Publications

Aaron L Miller, Anna S Garza, Betty H Johnson, E. Brad Thompson. Pathway interactions between MAPKs, mTOR, PKA, and the glucocorticoid receptor in lymphoid cells, *Cancer Cell International* 2007, 7:3 (28 March 2007)

Oezguen, N., Schein, C.H., Peddi, S.R., Power, T.D., Izumi, T. and Braun, W. A "moving metal mechanism" for substrate cleavage by DNA repair endonuclease APE-1. *Proteins*, [Epub ahead of print], 2007.

Schein, C.H. Ivanciuc O. and Braun, W. Bioinformatics approaches to classifying allergens and predicting cross-reactivity. *Immunol. Allergy Clin. North Am.*, 27(1):1-27 2007.

Cummins, S.F., Xie, F., Misra, M., Amare, A., Jakubowski, J.A., de Vries, M.R., Sweedler, J.V., Nagle, G.T. and Schein, C.H. Recombinant production and structural studies of the alypsia water-borne protein pheromone enticin indicates it has a novel disulfide stabilized fold. *Peptides*, 28(1):94-102, 2007.

Ribar B, Prakash L, Prakash S. ELA1 and CUL3 are required along with ELC1 for RNA polymerase II polyubiquitylation and degradation in DNA-damaged yeast cells. *Mol Cell Biol.* 2007 Apr;27(8):3211-6.

Hilser, V. J. and E. B. Thompson (2007) Intrinsic Disorder as a Mechanism to Optimize Allosteric Coupling in Proteins. *Proc. Nat. Acad. Sci. USA.* In Press.

Liu, T., Whitten, S.T., and V.J. Hilser (2007) Functional Residues Serve a Dominant Role in Mediating Cooperativity of the Protein Ensemble. *Proc. Nat. Acad. Sci. USA.* 104, 4347-4352.

Hafenstein S, Palermo LM, Kostyuchenko VA, Xiao C, Morais MC, Nelson CD, Bowman VD, Battisti AJ, Chipman PR, Parrish CR, Rossmann MG. Asymmetric binding of transferrin receptor to parvovirus capsids. *Proc Natl Acad Sci U S A.* 2007 Apr 17;104(16):6585-9.

Ye Y, Lin Y, Perez-Polo JR, Huang MH, Hughes MG, McAdoo DJ, Manickavasagam S, Uretsky BF, Birnbaum Y. Enhanced Cardioprotection Against Ischemia-Reperfusion Injury with a Dipyridamole and Low-Dose Atorvastatin Combination. *Am J Physiol Heart Circ Physiol.* 2007.

### Grants

**Dr. Sarita Sastry** received an R01 from NIH (which one) titled "Regulation and Function of PTP-PEST in colon carcinoma".

**Dr. Sankar Mitra** was awarded a grant on March 1, 2007 titled "Repair of Oxidized Bases in Mammalian Genomes" Project period from the National Cancer Institute.

**Dr. Olivera Nesic and Dr. Stanley Watowich** were awarded a bridging grant from the John Sealy Memorial Endowment Fund for Biomedical Research.

**Dr. David Gorenstein** was awarded a grant by the Welch Foundation for a project entitled, "Combinatorial Selection, Structure, and Design of Antiviral Thioaptamers".

**Dr. Jenny Gu** has been named a Jeane B. Kempner Scholar by the Dean of Medicine for 2007-2008. Dr. Gu's selection was based on her application entitled, "Bridging the Knowledge Gap between Sequence Space and Protein Thermodynamic Profiles". Dr. Gu is a post-doctoral fellow working with **Dr. Vince Hilser**.

***To have your publication or award included in the monthly newsletter, please send the information directly to Lisa Pipper (lpipper@utmb.edu) by the 1st of each month.***

## Faculty on the Road

Dr. Cheryl Watson attended the Texas Forum on Reproductive Sciences at the Institute for Biosciences and Technology, Texas Medical Center, Houston, TX on April 19-20th.

Dr. Satish K. Srivastava visited the Gladstone Institute of Cardiovascular Disease in San Francisco, CA. on April 6-8 to present a seminar entitled, "A Novel Pathway Linking Oxidative Stress & Inflammation"

On April 9th & 10th he was at the University of California-San Francisco, to collaborate with Dr. Jim Wells.

On April 11th he presented a seminar at Genentech, Inc. on the "Prevention of Colon and Lung Cancer by Aldose Reductase Inhibition"

On April 12th -14th he traveled to the City of Hope National Medical Center and Beckman Research Institute to collaborate with Dr. Balenderin and consult with Dr. Binghui Shen in Duarte, CA.

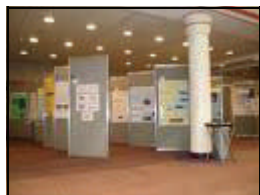


The following abstracts were presented at the American College of Cardiology Meeting March 2007 by Dr. Yochai Birnbaum's Group.

Birnbaum, Y., Lin, Y., Ye, Y., Martinez, J.D., Huang, M-H., Perez-Polo, J.R., Uretsky, B.F.. Aspirin before reperfusion blunts the infarct size limiting effect of atorvastatin. *Journal of the American College of Cardiology* 49,(Suppl. A):184A; 2007.

Ye, Y., Ramanna, M., Lin, Y., Martinez, J.D., Uretsky, B.F., Perez-Polo, J.R., Birnbaum, Y.. The role of adenosine in activation of endothelial nitric oxide synthase (eNOS) by atorvastatin: adenosine, generated by ecto-5'-nucleotidase, is needed for Akt phosphorylation by phosphorylated 3-phosphoinositide-dependent kinase 1. *Journal of the American College of Cardiology* 49,(Suppl. A):184A; 2007.

Birnbaum, Y., Ye, Y., Lin, Y., Nishi, S.P., Uretsky, B.F., Perez-Polo, J.R.. Phosphorylation of 5-lipoxygenase by protein kinase A determines whether cardiomyocytes will produce 15-epi-lipoxin A4 or leukotriene B4 when incubated with atorvastatin and pioglitazone. *Journal of the American College of Cardiology* 49,(Suppl. A):316A; 2007.



Birnbaum, Y., Ye, Y., Nishi, S.P., Lin, Y., Huang, M-H., Uretsky, B.F., Perez-Polo, J.R.. Activation of peroxisome proliferator-activated receptor  $\gamma$  (PPAR- $\gamma$ ) by atorvastatin is mediated by 15-deoxy-delta 12,14-PGJ<sub>2</sub>. *Journal of the American College of Cardiology* 49,(Suppl. A):355A; 2007.

*American College of Cardiology* 49,(Suppl. A):355A; 2007.

The following abstract will be presented April 21 at the ATVB meeting Chicago by Dr. Birnbaum's Group:

Ye, Y., Manickavasagam, S., Lin, Y., Huang, M-H., Perez-Polo, J. R., Birnbaum, Y.. Cilostazol and atorvastatin have synergistic effects on endothelial nitric oxide synthase phosphorylation and protection against ischemia-reperfusion injury. *Arteriosclerosis, Thrombosis, and Vascular Biology* 2007.

***To have your travels included in the monthly newsletter, please send the information directly to Lisa Pipper (lpipper@utmb.edu) by the 1<sup>st</sup> of each month.***

**Featured Abstract by BMB Faculty*****ELA1 AND CUL3 ARE REQUIRED ALONG WITH ELC1 FOR RNA POLYMERASE II POLYUBIQUITYLATION AND DEGRADATION IN DNA-DAMAGED YEAST CELLS***

Balazs Ribar, Louise Prakash, and Satya Prakash\*

Department of Biochemistry and Molecular Biology, University of Texas Medical Branch, Galveston, Texas 77555-1061. Received 16 January 2007/ Accepted 6 February 2007

Treatment of yeast and human cells with DNA-damaging agents elicits lysine 48-linked polyubiquitylation of Rpb1, the largest subunit of RNA polymerase II (Pol II), which targets Pol II for proteasomal degradation. However, the ubiquitin ligase (E3) responsible for Pol II polyubiquitylation has not been identified in humans or the yeast *Saccharomyces cerevisiae*. Here we show that elongin A (Ela1) and cullin 3 (Cul3) are required for Pol II polyubiquitylation and degradation in yeast cells, and on the basis of these and other observations, we propose that an E3 comprised of elongin C (Elc1), Ela1, Cul3, and the RING finger protein Roc1 (Rbx1) mediates this process in yeast cells. This study provides, in addition to the identification of the E3 required for Pol II polyubiquitylation and degradation in yeast cells, the first evidence for a specific function in yeast for a member of the elongin C/BC-box protein/cullin family of ligases. Also, these observations raise the distinct possibility that the elongin C-containing ubiquitin ligase, the von Hippel-Lindau tumor suppressor complex, promotes Pol II polyubiquitylation and degradation in human cells.

[{Full Text}](#)**New Employees**

Mikhail Y. Kochukov, Ph.D. joined Dr. Cheryl Watson's lab.