

BIOCHEMISTRY & MOLECULAR BIOLOGY TODAY



BMB
Biochemistry & Molecular Biology



JUNE 2007 NO. 226

Chair's Message

Based on the latest NIH figures received, our Department decreased its NIH funding in 2006 by 5%, which is better than all but one other basic science department that lost 2%. These figures do not include non-NIH and contract funding. This is important, given that BMB holds 15% of all SOM NIH grants, bringing in 13% of all the NIH dollars that come to the SOM. Nevertheless, when taken together, as of a month ago, by our calculations on balance we have not lost research funding this year, at a time when NIH funding is very difficult to obtain. I have to add with a note of pride that our young faculty, Chunming Liu, Sarita Sastry and Jianhang Jia are establishing their funded research programs on schedule within the 3-5 year expectation. Perhaps more telling are the awards our faculty receive both in the research and teaching arenas and the excellent papers they publish in high-quality, high-impact journals.

Both the Graduate School and School of Medicine Commencements were great occasions. At the latter, the invited speaker, Dr. Carson, gave a truly inspiring, and on occasion amusing, address; it is available on CD to those interested. Only 6 of our faculty showed up; I sincerely hope that more attend next year. Again, Departmental policy is that a faculty member should attend graduation every 3 years, and the Department will pay for the regalia.

Our faculty recruitment effort is again in high gear. Over the next couple of months we will have several applicants on campus. This is your opportunity to select your colleagues and coworkers for the future. Please participate in the process. Dr. Sankar Mitra is chairing this Search Committee, and will be glad to hear from you. In the Fall, we will be starting a third round of recruitment; more on that later in the summer.

As you all know, beginning this Fall, graduate student tuition will be

supplied from the funding sources that pay for the stipends the students receive. For those students being supported by sources that prohibit this, there is a problem. The graduate school leadership and our own Graduate Program and Track Directors (Lillian Chan and Wayne Bolen) are working hard on ways to solve this problem.

Do remember that you have until August 31, 2007, to fulfill your compliance obligations online. These are mandatory, and failure to fulfill this requirement automatically stops your paycheck in September. They should not take much time -- they are basic common sense, and if you proceed to the test and whiz through it, you should be able to do it all in half an hour. If you ever passed a driver's license test (if you see a child running into the street do you (a) stop (b) speed up (c) aim?) type of questions.

Not to belabor the point, but hurricane season is upon us

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Special Items of Interest

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Chair's Message (cont.)

once again. While last year turned out to be a mild season, there are no guarantees about this one. Now is the time to make plans for the summer months for your home, your laboratory and your office. Discuss with your group how much plastic (to cover equipment), dry ice, batteries, etc. you will need. Insist that all data be backed up onto the UTMB server or portable storage units (CDs, DVDs, or external drives). Gather the contact telephone numbers and non-UTMB-based e-mail addresses of your students, postdocs and staff, and provide them with the same information. Also, please provide this information to the Departmental Office. Let us know how we can reach you in an emergency and who your lab backup person is, especially if you are going on vacation. The University is making arrangements for off-Island telephone and electronic points of contact. Finally, don't fret too much! If you are prepared, and key decisions are made before everybody else heads for the hills, it should be OK.

Now that summer is really here, do enjoy the water and life on a tropical isle!

Graduate Program News—BCSO News

The Pioneering Biological Discovery Seminar organized by BCSO will start in June. Our first speaker is Dr. Isaiah Josh Fidler from M.D. Anderson. He will be here on Wednesday, June 20th and give a seminar titled "Anti-Vascular Therapy of Cancer Metastasis" on Thursday, June 21st at noon in the Basic Science Auditorium. Dr. Fidler is a dynamic and entertaining speaker and is one of the great teachers in modern tumor biology. You can find more information about him by visiting his [webpage](#).



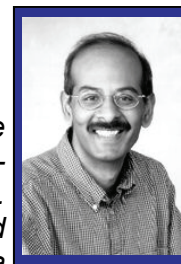
Dr. Fidler

Awards and Announcements

RETIREMENT CELEBRATION for DR. EDMUND CZERWINSKI

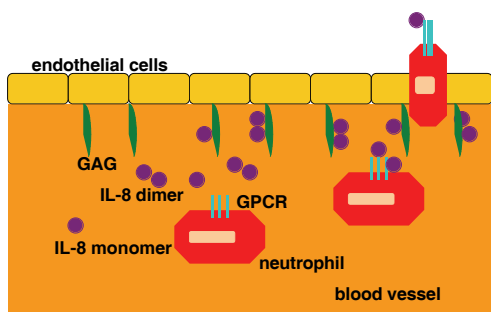
Dr. Edmund Czerwinski will retire from his position as Associate Professor, Biochemistry and Molecular Biology, on June 30, 2007. The Department will honor his 29 years of service at a reception at the Rosenberg House on Wednesday, June 28 at 5:00 pm.

Dr. Czerwinski joined BMB in 1978. Most recently, his work has been focused on investigation of the structural basis of cedar pollen hypersensitivity, in collaboration with Dr. Randy Goldblum of UTMB. He has crystallized and solved the structures of two cedar pollen allergens using x-ray crystallography, and has analyzed the epitopes involved in pollen hypersensitivity. Dr. Czerwinski has also continued to pursue his interest in antischistosome compounds, solving a number of small molecule structures in the area. Following his retirement, he will have the title Emeritus Associate Professor and will work on selected research projects with faculty members in different UTMB departments. BMB appreciates Dr. Czerwinski's contributions to the Department's research and teaching programs and wishes him success and fulfillment in all his future ventures (and adventures).

Faculty Focus:**Krishna Rajarathnam, Ph.D., Assoc. Professor, BMB**

Krishna Rajarathnam received his Ph.D. in Chemistry with Dr. La Mar from the University of California at Davis. Using paramagnetic NMR, he showed that the side-chain steric bulk of conserved amino acids does not influence ligand tilt in myoglobin. This observation was a major paradigm shift from the textbook description of ligand binding to heme proteins. He then joined Dr. Sykes' laboratory in Edmonton, Canada where he solved several chemokine structures using NMR, and also identified various structural principles that govern chemokine function. He joined the faculty of BMB in October 1998.

Dr. Rajarathnam's current research interests are geared towards understanding the molecular mechanisms by which interleukin-8 (IL-8) and related chemokines recruit leukocytes and the design of highly specific and potent drugs to treat inflammatory diseases by blocking chemokine function.



A schematic of IL-8 monomers and dimers both in solution and GAG-bound form

Recruitment and accumulation of circulating leukocytes involves a series of highly coordinated events, and clearly checkpoints in trafficking leukocytes exist. A malfunction in any one of the checkpoints could be the major causative factor in the pathophysiology of inflammatory diseases.

His lab is currently exploring the hypothesis that IL-8 monomer-dimer equilibrium critically regulates trafficking at these checkpoints. IL-8 function involves binding to both G protein coupled receptors (GPCRs) and to glycosaminoglycans (GAGs). Therefore, knowledge of how IL-8 monomers and dimers interact with GPCRs and GAGs is pivotal to understanding how IL-8 mediates *in vivo* neutrophil recruitment. Towards this goal, he

uses a variety of structural, biophysical, and biochemical tools from solution NMR to mutagenesis, *in vitro* cell-based assays, and animal model studies. In particular, he has been studying the structural and dynamic properties of IL-8 complexed to receptor N-terminal domains. Further, using a panel of IL-8 mutants with compromised GPCR and GAG function, and varying ability to form dimers, he is studying IL-8 mediated neutrophil recruitment *in vitro* and *in vivo*.

Selected Publications

Fernando, H., Chin, C., Rösigen, J., and Rajarathnam, K. Dimer Dissociation is Essential for Interleukin-8 (IL-8) Binding to CXCR1 Receptor *J. Biol. Chem.* 279:36175-36178 (2004) (See commentary: Dimeric Chemokine May Be an Inhibitor *Science STKE* 248, tw307; 2004).

Rajagopalan, L., Rösigen, J., Bolen, D. W., and Rajarathnam, K. Novel use of an osmolyte to dissect multiple thermodynamic linkages in a chemokine ligand-receptor system *Biochemistry* 44:12932 (2005).

Rajarathnam, K., Prado, G. N., Fernando, H., Clark-Lewis, I., Navarro, J. Probing receptor binding activity of interleukin-8 dimer using a disulfide trap. *Biochemistry* 45:7882 (2006)

Rajarathnam, K. A reply to 'A novel peptide CXCR ligand derived from extracellular matrix degradation during airway inflammation'. *Nature Medicine* 12:603 (2006)

Rajagopalan, L. and Rajarathnam, K. Structural basis of chemokine receptor function – A model for binding affinity and ligand selectivity *Bioscience Reports* 26:325-339 (2006).

Fernando, H., Nagle, G., and Rajarathnam, K. Thermodynamic Basis of Interleukin-8 Monomer Binding to the CXCR1 Receptor N-domain: An Isothermal Titration Calorimetry Study *FEBS J* 274: 241-251 (2007).

Nasser, M.W., Raghuvanshi, S.K., Malloy, K.M., Gangavarapu, P., Shim, J.Y., Rajarathnam, K., Richardson, R.M. CXCR1 and CXCR2 activation and regulation: Role of aspartate 199 of the second extracellular loop of CXCR2 in CXCL8-mediated rapid receptor internalization. *J. Biol. Chem.* 282: 6906-6915 (2007).

SPECIAL SPOTLIGHT: Graduate Student Vincent Dimayuga returns from Military Duty in Iraq

BMB would like to give a warm welcome home salute to Vincent Dimayuga. For those who may not recognize his name, Vincent began his PhD studies with UTMB in May 2003. After his first year was completed, he was pulled back into active duty by the Army Reserves and served two consecutive tours in Iraq. With the rank of First Lieutenant, Vincent's position was the Civil Affairs Officer for northern Baghdad.

Part of his responsibilities included leaving the safety of the Green Zone accompanied by a minimum of three Humvees, each of which included a driver, truck commander, and gunner, to meet with the local community members, attend city council meetings and provide feedback about concerns by the Iraqi people. Vincent's civil affairs unit spent over ten million dollars on improving the infrastructure of local neighborhoods

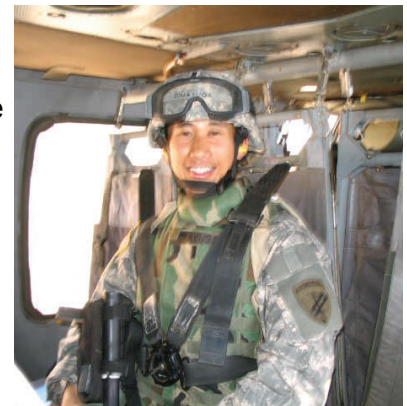
destroyed by insurgents. His reserve unit built schools and women's shelters, repaired canals for irrigating local farms, and repaved roads. This road repair is a crucial action for keeping the troops safe, as potholes and trash are hiding places for planting IED's (improvised explosive devices). The road where Bob Woodruff, ABC newsman, was hit by an IED in January 2006 was close to where Vincent's unit worked. Unfortunately, one of the medics within Vincent's unit was killed by an IED and his interpreter was taken hostage, making the cruel reality of war ever present.

Vincent reports that there were also moments of happiness, especially when working with the

Iraqi children, many of whom spoke English. Vincent was also involved in managing the two national elections by encouraging people to vote, establishing polling sites, ensuring ballots remained confidential and communicating security concerns. He reports that in general, the locals were satisfied with the voting results and the 60-80% turnout.

It's easy to forget what the men and women of the armed services endure during times of conflict, and most of us are touched in personal ways by someone who puts their life on the line. When you see Vincent, please join us in welcoming him home and back to finishing his graduate studies in Dr. John Papaconstantinou's laboratory.

If you would like to read more about Vincent's tour of duty in Iraq, he has written a summary of his experiences with the culture and the challenges that he experienced during his 2 tours (15 months). His account can be found [here](#):



Administrator's Notes

Emergency Weather Preparations

Here are the things relating to Hurricane Preparedness that should be reviewed and updated.



⇒ Lisa Pipper has sent to all BMB faculty an electronic Logistics Supply Request Form. Each lab should indicate the number of 10-pound blocks of dry ice and the amount of liquid nitrogen the lab will require if the campus is being evacuated or otherwise prepared for a strike by a major storm. The request form should be returned to Lisa Pipper by June 22, 2007, and Lisa will transmit all requests to Logistics for entry into the master database of requirements for these supplies. We recommend that individual labs *do not* contact Logistics directly about orders for emergency supplies. By placing orders through a central BMB contact, we believe we can obtain better follow-up and coordination assistance from Logistics when the time comes to activate emergency plans.

⇒ Lisa Pipper will also be sending out an electronic form for provision of emergency contact information. We ask that everyone complete the form and return it as soon as possible to allow Lisa to prepare a Departmental electronic record of contact information. This information will be used only by the Chair and senior Department managers for communicating with faculty and staff in the event of an evacuation or other major emergency.

⇒ Each employee must have on file in the Department office a signed copy of the Emergency Preparedness Employee Acknowledgement Form. The form on file must be the version approved in April 2006, which indicates that UTMB now utilizes only two (2) emergency employee classifications: Essential and Non-Essential. Each employee's classification must be indicated on the form and acknowledged by the employee's signature. If a form was filed last summer and there is no need to amend the original classification, then an employee does not need to take any further action. For new employees and others who may not have a form on file, the form should be completed and returned to **Rosemary Roque** in the Administrative Office as soon as possible. Please note that only employees with the Essential classification will be permitted to return to campus to check on laboratories before the "all clear" notification to return is provided. We recommend that one person in each group with knowledge of lab operations and vulnerabilities be classified Essential in case it should be necessary to assess lab conditions early in any recovery period.

Each lab should review the equipment that is currently placed on emergency power circuits. If there are multiple items on one circuit, it's important to confirm that there is sufficient amperage available to support the equipment during fluctuations in power availability. Please contact me (marmille@utmb.edu) if there are questions about emergency circuits.

Any questions regarding preparations for hurricanes or other emergencies should be sent to Lisa Pipper (lpipper@utmb.edu). Questions and answers that would be of general interest will be sent out to all Department members.

Continued on page 6

Administrator's Notes (continued)

In next month's Newsletter, I will outline some points to keep in mind regarding the possibility of a major power failure, which could be caused by local weather conditions or any number of other factors.

Leave Balances and Leave Request Forms

All Department members are asked to review the leave balances indicated on their monthly or bi-monthly electronic payroll statements and to complete leave request forms for any leave that may not yet have been documented. Because the Department is now responsible for covering the financial obligations relating to all accrued leave, it is very important that any leave taken by Department members be documented appropriately so that leave accruals are stated accurately in the University's accounting system. Electronic versions of both the "Leave Request Form" and the "Travel Authorization Form" are available in the Public Folder for Biochemistry and Molecular Biology.

Temperature Problems in BSB and MRB

There have been significant problems lately with temperature control in labs and offices. The Area Supervisor for Facilities Operations and Management, Tim Schilling, reports that the problems have been related to various issues with mechanical equipment and campus environmental control systems. To help assure that complaints about temperature control are addressed appropriately, Tim asks that occupants of BSB and MRB notify his office of specific problems in addition to calling the FOAM Utilities Desk. Whenever a call is placed to the Utilities Desk (21586) to report a temperature problem in a specific space, BMB members should also send an e-mail message to Tim's Administrative Associate, Judy Banks, at jbanks@utmb.edu. If no response has been received from utilities staff two hours after the notification, a follow-up call should be made to Judy at 22414. She will relay the information to Tim, who will check on the issue and provide information to the "customer".

Tracie Albritton, OSP Pre-Award Specialist, will be on vacation June 29-July 8

BMB's Pre-award Specialist, Tracie Albritton, will be on vacation beginning on June 29. Tracie asks that any BMB members who are preparing grant proposals for the July 5 NIH deadline notify her as soon as possible at taalbrit@utmb.edu. BMB will be assisted by the very capable Kelly Lee during Tracie's absence. If any investigators would like for Tracie to review draft proposal materials before she leaves, she asks that the material be submitted by June 25.

An Important Job Well-Done

Karen Jones, Angelina Johnson, Rhoda Thompson, and Lori Blackwell did an excellent job supporting the organization and presentation of last month's 12th Annual Structural Biology Symposium. Karen and the team wrangled myriad details to make sure the speakers and attendees received a warm Texas welcome and to facilitate smooth running of all the symposium events. Their professionalism and dedicated effort contributed significantly to the symposium's success.

Marianne



Publications & Grant Awards

Hazra TK, Das A, Das S, Kow YW, Roy R. 2007. Oxidative DNA damage repair in mammalian cells: A new perspective. In DNA Repair. 6: 470-480 (H. Krokan, G. Slupplang, Eds). Elsevier

D.E. Volk, V. Thivyanathan, A. Somasunderam and **D.G. Gorenstein** Ab initio base-pairing energies of an oxidized thymine product, 5-formyluracil, with standard DNA bases at the BSSE-free DFT and MP2 theory levels. *Org. Biomol. Chem.* **2007**, 5(10), 1554-1558.

Kang J, Lee MS, **Watowich SJ, Gorenstein DG.** Combinatorial selection of a RNA thioaptamer that binds to Venezuelan equine encephalitis virus capsid protein. *FEBS Lett.* 2007 Jun 26;581(13):2497-502.

Hilser VJ, Thompson EB. Intrinsic disorder as a mechanism to optimize allosteric coupling in proteins. *Proc Natl Acad Sci U S A.* 2007 May 15;104(20):8311-5. Epub 2007 May 9.

Grants

Dr. W. Braun received an NIH subaward (Total cost \$276,975 for five years) from the Mayo Clinic, Rochester for the project "Measles Virus Entry: Engagement of the Receptors and Infection Progression".

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.

Featured Abstract by BMB Faculty

COMBINATORIAL SELECTION OF A RNA THIOAPTAMER THAT BINDS TO VENEZUELAN EQUINE ENCEPHALITIS VIRUS CAPSID PROTEIN.

Kang J, Lee MS, Watowich SJ, Gorenstein DG. **FEBS Letters**, Volume 581, Issue 13, Pages 2497-2502. [Full Text Article](#)

Sealy Center for Structural Biology and Department of Biochemistry and Molecular Biology, The University of Texas Medical Branch, Galveston, TX 77555, USA.

A phosphorothioate RNA aptamer (thioaptamer) targeting the capsid protein of Venezuelan equine encephalitis virus (VEEV) was isolated by in vitro combinatorial selection. The selected thioaptamer had a strong binding affinity (approximately 7nM) and high specificity for the target protein. For the binding to the protein, the overall tertiary structure of the thioaptamer is required. We introduce two theoretical methods to examine the effect of phosphorothioate modification on the enhancement of binding affinity and one experimental method to examine the nature of the multiple bands of thioaptamer in a native gel.

Faculty on the Road

Dr. Satish K. Srivastava traveled to Fort Lauderdale, FL on May 5th-9th to attend the Association for Research in Vision and Ophthalmology (ARVO) annual meeting.

Dr. Kota V. Ramana traveled to Fort Lauderdale, FL on May 5th- 9th to attend the Association for Research in Vision and Ophthalmology (ARVO) annual meeting.

Dr. Naseem H. Ansari presented an abstract at the Association for Research in Vision and Ophthalmology (ARVO) annual meeting in Fort Lauderdale, FL. May 5th-10th. The abstract was entitled, "Potential of Metal Chelation Therapy in the Delay of Diabetic Cataract".



Dr. E. Brad Thompson traveled to the University of Arkansas for Medical Sciences in Little Rock, Arkansas on May 7, 2007. He visited the Myeloma Institute for Research & Therapy to collaborate with Drs. Barlogie, Epstein, Shaughnessy, van Ree and Yaccoby.

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

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

New Employees

Terry Kirtley, Financial Analyst II, working with Ernest Leal and the BMB finance team.

Mengyi Ye, Research Associate II working with Dr. Marc Morais

Yuki Takayama, Ph.D., Postdoctoral Fellow in Dr. Junji Iwahara's Lab.

