

Inside MBC

"...molecular medicine through biotechnology"

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Budget Cuts Lead to UMBI Layoffs

The initial impact of the state fiscal crisis has hit UMBI. Four individuals at UMBI Central Administration were laid off: two in the Development Office, one in the Office of Institutional Affairs and one in the Office of Communications. This is believed to be only the first round of cuts. As the legislature finished its session, the University System of Maryland still remains the most vulnerable of the state agencies to even deeper cuts.

MBC Director W. J. Lederer has kept the faculty apprised of the impending budget reductions. While MBC has had to forego some planned expansion, there have been no layoffs. Even with estimated cuts to come, MBC is hopeful that it can absorb any additional budget reductions without significantly damaging forward progress of our research programs.

Still it is difficult to accept that some co-workers will not be here and all of us hope that they will find other positions quickly and easily. The next round of cuts will be final in a couple of months. UMBI has some cushion due to the extraordinary growth in outside funding, led by the MBC faculty, but more layoffs will be inevitable.

Remember the Alamo!

San Antonio witnessed a more benign invasion the beginning of March with the Annual Biophysical Society Meeting bringing scientists from all over the world to the Texas capital. MBC was there in full force, with 11 post-ers and one platform session being presented by post-docs and students, making it one of the largest continental faculty making it one of the largest continental faculty making it one of the most important for many members of the MBC community. It brings together several disciplines including bioimaging, cell function, cell structure and biophysics. Seeing and discussing the latest techniques and newest data re-energizes everyone's research when they come back to the laboratory.



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On the Home Front

National issues have struck home once again with the invasion of Iraq. Captain Ryan Hughes, son of Assistant Director Tim Hughes, has been deployed there. Ryan, who was within two months of leaving the army entirely and had just returned from Afghanistan last year, was once again in the thick of things. Together with Captain "Kit" Parker (*Inside MBC*, Vol. 5 No. 6), that meant that MBC had two members of its extended "family" overseas. Tongo Best, MBC's Administrative Assistant, organized a care package drive for the two. Everyone contributed to an eclectic mix of food, entertainment, toiletries and other goodies not easily obtained in war zones. She also made sure that Dr. Parker got several current issues of *Science* magazine. Pamela Wright, Assistant to the Director, made banners for everyone to sign to be included in the packages. Ms. Wright also put up two bulletin boards with pictures and messages from the two soldiers. The boxes were sent off in April. It was a wonderful joint effort. Kudos to Ms. Best for her efforts and inspiration.



Ms. Tongo Best with one of the banners that was sent to "our boys overseas."

Nice in Nice

The French Riviera is not the usual place one would expect to be discussing nasty microorganisms, but that is just what happened starting on March 30th and continuing through April 3, 2003. Nice, France played host to the 5th International Conference on Anthrax held with the 3rd International Workshop on the Molecular Biology of *Bacillus cereus*, *B. anthracis* and *B. thuringiensis*. As a news item in *Science* pointed out (*Science* 300:414-415, April 18): "Anthrax research ain't what it used to be. The last time they all got together was in June 2001 at a small liberal arts college in Annapolis, Maryland, where they shared a picnic on the lawn and slept in dormitory rooms for \$20 a night."

Several MBC faculty members attended the conference. Dr. Les Baillie, head of MBC's Biodefense Initiative on one of the conference organizers, presented a poster on his shark antibody work (*Inside MBC* Vol. 5, No. 4) and chaired a session on "Vaccines and therapeutics of anthrax". Adjunct faculty members were also present. Timothy Read, from The Institute for Genomic Research spoke on "*Bacillus anthracis* genomics" and Captain Dr. Darrell Galloway, US Naval Research Laboratory, presented research on "Genetic immunization against anthrax". The *Science* article highlighted both of these individuals and both are collaborators of Dr. Baillie.

The inclusion of the workshop on anthrax and its probable parent, *B. cereus*, and close relative, *B. thuringiensis*, emphasizes the importance of understanding the basic biology of the microorganism, something that is sorely lacking and hampering researchers' abilities to develop countermeasures to the possible use of anthrax by bioterrorists. Current technology to detect anthrax is still unreliable and vaccines are the only known preventative measures but the ones available take 18 months to produce immunity and require boosters. These problems are the focus of these MBC faculty members.

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Dr. Monteiro Has Busy Spring

Dr. Mervyn Monteiro was again occupied this spring organizing the now 13th Annual Symposium in Molecular and Cell Biology, along with Dr. Peter Melera. The theme this year was "Perspectives in Biomedical Science". The speakers for this symposium are always an eclectic mix of well-known scientists and this year was no exception. Dr. Jorge Galan from Yale University, Dr. Roger Brent of the Molecular Sciences Institute, Dr. Judy Campisi from Lawrence Berkeley National Laboratory and Dr. Jeremy Nathans from Johns Hopkins University, who substituted for Dr. James Rothman, Memorial Sloan-Kettering, shared the stage with Dr. H. Robert Horvitz, MIT, who received the 2002 Nobel Prize in Medicine. It is a tribute to the quality of research at the University of Maryland Baltimore and UMBI and to the organizers of the MCB symposium that such individuals are willing to participate. The day-long symposium places particular emphasis on pre-doctoral student participation, unusual for scientific symposiums attracting this caliber of speaker. The symposium is co-sponsored by the Graduate School Program in Molecular and Cell Biology and The Marlene and Steward Greenebaum Cancer Center.

In addition to being an organizer for the symposium, Dr. Monteiro has taken on other duties this spring. He accepted an invitation to serve as a member of the Molecular, Cellular and Developmental Neurosciences 1 Study Section for the NIH Center for Scientific Review. His term will start in July and will last for 5 years. As a member of an NIH study section, he will be responsible for reviewing grant applications. According to Dr. Ellie Ehrenfeld for the Center, "Service on a study section ... requires mature judgment and objectivity as well as the ability to work effectively in a group...." Dr. Monteiro certainly brings those qualities to everything he does.



From left to right: Dr. Mervyn Monteiro, Dr. Peter Melera, Dr. Judy Campisi, Dr. H. Robert Horvitz, Dr. Jeremy Nathans, Dr. Jorge Galant and Dr. Roger Brent.

MBC/UMBI Perspectives

By Tim Hughes

Next...1989, a time of upheaval and continued growth...

While MBC was expanding, still physically within University of Maryland Baltimore, UMAB had a number of presidential changes. This made it difficult for UMBI's president, Dr. Rita Colwell, to have a continuum of interactions with her presidential counterpart at UMAB. Two of the presidents appointed during this period were actually only acting appointments.

Throughout this period and earlier, MBC was developing the master facility document, called a "Program" document, that would provide UMBI and USM the justification to go to the legislature for funding to purchase and then develop an old Hutzler's warehouse. Located within the area of the UMAB campus, the Hutzler's warehouse had been identified as an excellent opportunity to give MBC the space it needed. Because MBC was not going to have enough faculty and staff to immediately occupy a 200,000 sq. ft. building, an excellent relationship with UMAB was critical. The plan was to have researchers with complementary scientific interests, regardless of whether they were UMBI or UMAB, support scientific foci of mutual interest to both institutions and occupy the building. The intent was to have Medical Biotechnology Center related research activities in the building, which would include faculty from UMAB. Dr. Joseph Lakowicz and the Center for Fluorescence Spectroscopy from the School of Medicine, Department of Biochemistry was an excellent example of this mutually beneficial relationship.

Despite three UMAB Presidential changes in 1989 we did finish and submit the facility Program document to the State. UMBI President, Dr. Rita Colwell, signed an agreement with Dr. William Kinnard, then UMAB Acting-President, and Dr. John Toll, the USM Chancellor, which outlined a five year plan for occupancy of the yet-to-be developed Hutzler's facility.

Additional new hires in 1989 included the recruitment of Dr. Mervyn Monteiro from the laboratory of Dr. Donald Cleveland at Johns Hopkins University. Dr. Monteiro's primary appointment was matched with a secondary appointment in the UMAB Department of Neurology. Additional MBC secondary faculty appointments included Drs. Peter Melera and Rong-Fong Shen. Lynn Thomas resigned as the Administrative Assistant for MBC in 1989 and MBC hired Gwen Thompson. Gwen was also "acquired" from another UMBI center, the Center for Public Issues in Biotechnology.

Next...the 1990's begin...

Correction: Dr. Xuehong Xu has joined Dr. Bruce Vogel's laboratory as an Assistant Professor. Our apologies for the error.

Alamo continued.

The following posters or platform sessions were given by members of MBC :

Ramay, H.R., **Sobie, E.A., Lederer, W.J., Jafri, M.S.** (2003) A model for calcium dynamics in the sarcomere. Biophysical Journal 84 (suppl):132a

Mughal, M., **Schulze, D.H., Lederer, W.J., Ruknudin, A.M.** (2003) Regulation of $\text{Na}^+/\text{Ca}^{2+}$ exchanger phosphorylation. Biophysical Journal 84 (suppl):151a.

Hartmann, H., Guatimosim, S., Reid, W., Denaro, F., Bryant, J., **Lederer, W.J.** (2003) Reduced SERCA-2 expression underlies cardiomyopathy in HIV transgenic rat. Biophysical Journal 84 (suppl):258a.

Lukyanenko, V.I., Lederer, W.J., Salnikov, V.V. (2003) Role of intermyofibrillar mitochondria (IMM) in local regulation of the SR Ca Cycling. Biophysical Journal 84 (suppl):388a.

Guatimosim, S., Reikine, S., Marks, A.R., **Lederer, W.J.** (2003) RyR macromolecular complex: a tale of phosphatases and kinases. Biophysical Journal 84 (suppl):429a.

Song, L.-S., Lederer, W.J., Shou, W., Cheng, H. (2003) Modulation of RyR2 gating by FKBP12 in mouse myocytes. Biophysical Journal 84 (suppl):429a.

Holder, E., Gryczynski, Z., D'Auria, S., **Lakowicz, J.R.** Characterization of new long lifetime Cu(I) complexes and their application for macromolecular dynamics and medical diagnostics Biophysical Journal 84 (suppl):765a

Malicka, J., **Gryczynski, I.** Gryczynski, Z., **Lakowicz, J.R.** Effects of Fluorophore-to-Silver Distance on the Emission of Cyanine-Dye Labeled Oligonucleotides. Biophysical Journal 84 (suppl):1413a

Lakowicz, J.R., Malicka, J., D'Auria, S., **Gryczynski, I.** Release of the Self-Quenching of Fluorescence Near Silver Metallic Surfaces. Biophysical Journal 84 (suppl):1414a

Polumuri, S., **Ruknudin, A.M.,** Gille, T., **Schulze, D.H.** Alternatively Spliced Isoforms of Rat NCX1 Show Functional Differences When Expressed in 293HEK Cells. Biophysical Journal 84 (suppl): 2527a

Geddes, C.D., Roll, D., Parfenov, A. **Lakowicz, J.R.** Nobel-Metal Surfaces for Use in Metal-enhanced Fluorescence. Biophysical Journal 84 (suppl)

Sha, Q., Robinson S.W., McCulle S.L., Shorofsky, S.R., **Welling, P.A.,** Goldman, L., Balke, C.W. $\text{I}_{\text{Ca}(\text{TTX})}$ and Classical Cardiac Na Channels are Encoded by Different Genes. Biophysical Journal 84 (suppl):1625a (Platform Session)

Dr. Valeriy Lukyanenko discusses his poster on mitochondrial calcium signaling.



Dr. Chris Geddes discusses his poster on metal enhanced fluorescence.

MBC Happenings

Honors

Dr. Mervyn Monteiro was appointed to the Molecular, Cellular and Developmental Neurosciences 1 Study Section, NIH Center for Scientific Review. His term begins July 1, 2003.

Comings and Goings

MBC welcomes Nikhil Stefan Sobie, born March 6, 2003 to **Dr. Eric Sobie** and his wife Crystal.

Yvonne Koch, from Germany, joined Dr. Mervyn Monteiro's laboratory as a visiting laboratory assistant. Mark Kohr, Jr. is a laboratory assistant Dr. Joseph Kao's laboratory.

Grants and Contracts

Dr. Bruce Vogel, NIH, "The Molecular Genetics of Hemocytin." 4/1/03, \$249,480, yr 2 of 5.

Dr. Joseph Kao, NIH, "Water-Soluble Prodrugs for Activating Transgenome Expression." 3/1/03, \$111,375, yr 2 of 2.

Publications

Gryczynski I, Malicka J, Holder E, DiCesare N, **Lakowicz JR**. Effects of metallic silver particles on the emission properties of [Ru(bpy)(3)](2+). CHEM. PHYSICS LTRS. 372 (3-4): 409-414 APR 29 2003.

Malicka J, **Gryczynski I**, Gryczynski Z, **Lakowicz JR**. Effects of fluorophore-to-silver distance on the emission of cyanine-dye-labeled oligonucleotides. ANAL. BIOCHEM. 315 (1): 57-66 APR 1 2003.

Malicka J, **Gryczynski I**, Fang J, Kusba J, **Lakowicz JR**. Increased resonance energy transfer between fluorophores bound to DNA in proximity to metallic silver particles. ANAL. BIOCHEM. 315 (2): 160-169 APR 15 2003.

Roerig B, Chen BZ, **Kao JPY**. Different inhibitory synaptic input patterns in excitatory and inhibitory layer 4 neurons of ferret visual cortex. CEREBRAL CORTEX 13 (4): 350-363 APR 2003.

Zhou X, Giron JA, Torres AG, Crawford JA, Negrete E, Vogel SN, **Kaper JB**. Flagellin of enteropathogenic *Escherichia coli* stimulates interleukin-8 production in T84 cells. INFECT. IMMUN. 71 (4): 2120-2129 APR 2003.

Shen Y, Maliwal BP, **Lakowicz JR**. Red-emitting Ru(II) metal-ligand complexes. J. FLUOR. 13 (2): 163-168 MAR 2003.

Lin HJ, Herman P, **Lakowicz JR**. Fluorescence lifetime-resolved pH imaging of living cells. CYTOMETRY PART A 52A (2): 77-89 APR 2003.

Kostov Y, **Rao G**. Ratio measurements in oxygen determinations: wavelength ratiometry, lifetime discrimination, and polarization detection. SENSORS AND ACTUATORS B-CHEMICAL 90 (1-3): 139-142 Sp. Iss. SI APR 20 2003.

Tolosa L, Ge XD, **Rao G**. Reagentless optical sensing of glutamine using a dual-emitting glutamine-binding protein. ANAL. BIOCHEM. 314 (2): 199-205 MAR 15 2003.

Yang DM, **Song LS**, Zhu WZ, Chakir K, Wang W, Wu CH, Wang YB, Xiao RP, Chen SRW, Cheng H. Calmodulin regulation of excitation-contraction coupling in cardiac myocytes. CIRC. RES. 92 (6): 659-667 APR 4 2003.

Sha Q, Robinson SW, McCulle SL, Shorofsky SR, **Welling PA**, Goldman L, Balke CW. An antisense oligonucleotide against H1 inhibits the classical sodium current but not $I(\text{Ca}(\text{TTX}))$ in rat ventricular cells. J. PHYSIOL.-LONDON 547 (2): 435-440 MAR 1 2003.

CARB Researcher Gives Seminar

Dr. James Ames from the Center for Advanced Research in Biotechnology, a sister center of MBC located in Rockville, spoke on "Structure and Mechanism of DREAM and Recoverin" on April 15, 2003. These fascinating molecules, while related, are involved in very basic but very different processes. Recoverin is found in the retina. It is involved in light adaptation, "resetting" rhodopsin after photon excitation. DREAM, a homolog of recoverin, is believed to be involved in pain sensation. DREAM knockout mice have no feeling of pain. Dr. Ames is studying the structure of these two molecules to begin to understand their mechanisms of action and regulation within cells.

First TEDCO Award

Dr. Joseph Kao was the first MBC researcher to receive a University Technology Development Fund grant. The fund, administered by TEDCO (Technology Development Corporation) and initiated with the Maryland Department of Business and Economic Development, is designed to provide grants to university researchers for projects with commercial potential. Dr. Kao's research has developed a novel method of triggering biologically interesting molecules with lasers. Molecules are "caged" within a light sensitive molecule that renders them inactive. A pulse from a laser "unlocks" the cage and the molecule inside is released and becomes active. Dr. Kao has used this approach to probe various nerve pathways. It could be used in conjunction with gene therapy to activate genes once they are in place.

The award was made in February but the announcement did not appear until March.

Talks and Travels

Dr. Chris Geddes, Invited Speaker, Department of Biochemistry and Molecular Biology, University of Maryland, Baltimore, "Metal-Enhanced Fluorescence: Applications to Medical Imaging, Diagnostics and the Analytical Sciences" February 17, 2003.

Dr. Shengyun Fang, Invited Speaker, Department of Biochemistry and Molecular Biology, University of Maryland, Baltimore, "Endoplasmic reticulum-associated degradation vs tumorigenesis and metastasis: any connection?" March 3, 2003.

Dr. Timothy Read, Invited Speaker, 5th International Conference on Anthrax, Nice, France, "*Bacillus anthracis* genomics" March 31, 2003.

Dr. Ilia Baskakov, Speaker, Keystone Symposium on Molecular Aspects of Prion Diseases, Breckenridge, CO, "Pathway complexity of the Prion Protein assembly" April 2-6, 2003

Dr. Darrell Galloway, Invited Speaker, 5th International Conference on Anthrax, Nice, France, "Genetic immunization against anthrax" April 3, 2003.

Dr. Dan Schultz, Invited Speaker, Department of Microbiology & Immunology, University of Maryland, Baltimore, "Evolution of Ca²⁺ transport: from bugs to beasts" April 24, 2003.