

Inside MBC

"...molecular medicine through biotechnology"

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Inside:

- Summertime Visitor
- Talks of the Town
- MBC Welcomes New Faculty
- A Glowing Report
- First Class Effort

UMBI in the Morning

March 5, 2002 gave four members of MBC an opportunity to have breakfast with UMBI President, Dr. Jennie Hunter-Cevera. Assistant Professors Dr. Ilia Baskakov and Dr. Chris Geddes, Human Resources Associate Venus Windmill, and Pamela Wright (Research Coordinator and *Inside MBC* editor) represented MBC at the informal meeting at the Columbus Center. Representatives from other UMBI centers were there as well. These breakfast meetings are a way for Dr. Hunter-Cevera to meet personnel from all levels and acquire a different perspective on UMBI. It is also a way for members from the different centers to interact. For convenience, however, CAB and CARB share a separate breakfast meeting in Rockville.

Venus Windmill found the experience very useful, "It gave us a chance to talk with her [President Hunter-Cevera] one-on-one and bring up issues."

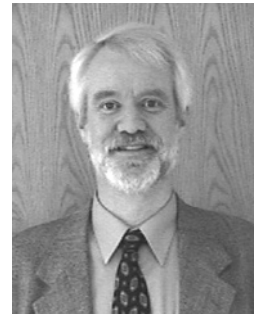
If you are interested in attending the next breakfast, please contact Tim Hughes.



Did you know that MBC went from one faculty member to 28 today in just 15 years? That is an average of 2 new faculty per year!

Heart of the Matter

"Cardiac Calcium and Sodium Transport in Arrhythmogenic Heart Failure" was the topic of the March 6, 2002 seminar given by Dr. Donald Bers at the invitation of Dr. W. J. Lederer and the Institute of Molecular Cardiology of MBC. Dr. Bers is chair of the Department of Physiology of Loyola University Chicago. Dr. Bers reported on how heart failure leads to contractile dysfunction and arrhythmia using the Aortic Insufficiency/Aortic Stenosis (AI/AS) rabbit model. This model shows arrhythmia and contractile dysfunction similar to human disease and permits Dr. Bers and his team to look at the causes of arrhythmogenesis in heart failure. Dr. Bers and his colleagues found that the twitch amplitude and the sarcoplasmic reticulum (SR) calcium load were down, and the sodium-calcium exchanger caffeine-induced


continued on page 4

MBC at the MCB Symposium

The MBC has close ties with many programs at University of Maryland, Baltimore. Dr. Mervyn Monteiro, MBC Associate Professor, exemplifies this as Associate Director of the Molecular and Cell Biology Graduate Program. That program held its 12th Annual Symposium March 21, 2002. In his active, behind-the-scenes role, Dr. Monteiro has been instrumental in the growing success of that endeavor. This year brought five renowned speakers to Baltimore: Dr. Leroy Hood, Director of the Institute for Systems Biology; Dr. Willem Stemmer, Vice

continued on page 3


Left to right: Drs. Peter Melera, Willem Stemmer, Leonard Guarente, Leroy Hood, and Mervyn Monteiro.

Summertime Visitor

MBC hosts many visitors but some of the most satisfying ones are those former students and postdoctoral fellows who come back to collaborate in the laboratories that trained them. One such returnee is Dr. Supatra Porasuphatana, who is spending her "summer" vacation with her thesis advisor, Dr. Gerald Rosen. Dr. Porasuphatana, who graduated in May, 2001, is an instructor in the Department of Toxicology, Faculty of Pharmaceutical Sciences, Khon Kaen University in Khon Kaen, Thailand, thus their academic year does not coincide with ours. April is the hottest month, so summer break is March through May. Khon Kaen University is the largest institution in northeast Thailand and is composed of 14 different schools or faculties.



Drs. Supatra Porasuphatana and Gerald Rosen.

Dr. Porasuphatana's work, started while she was working on her dissertation, centers on the nitric oxide synthase pathway and its by-products. She discovered a new mechanism of ethanol-induced free radical formation, creating by-products similar to those produced by the cytochrome P450 pathway. These by-products may be involved in the cellular damage produced by alcohol.

Dr. Porasuphatana enjoys getting away from the summer heat of Thailand and seeing old friends. She expects to continue to spend her "summers" with Dr. Rosen in the foreseeable future.



Editor and Designer: Pamela B. Wright
Assistant Editor: Tim Hughes

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Assistant Publisher: Joseph Kao, Assoc. Director MBC

Contact us at: wrightp@umbi.umd.edu or 1-410-706-8181
Medical Biotechnology Center
725 West Lombard Street
Baltimore, MD 21201 USA

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Talks of the Town

March was extremely packed with seminars as a series of young investigators were invited to the MBC as part of our Seminars in Molecular Medicine and Biotechnology series. The Carnegie Institute of Washington sent us Dr. Rachel Brewster, who spoke on "Patterning and Morphogenesis of the Vertebrate Central Nervous System." She talked about her work with early inductive signals that define neurogenic domains, groups of cells whose destiny is determined by what signals they receive. Dr. Elisabeth Barton, University of Pennsylvania, spoke next on "Transgenic and viral-mediated strategies to Promote Muscle Regenerative Capacity in Aging and Disease." She studied the satellite cells that are the source of muscle regeneration. Dr. Eric Grote of Yale University's topic was the "Molecular Membrane Fusion Machine." Dr. Grote's work looked at the mechanisms of cellular fusion, including those related to yeast sexual reproduction, budding or cell-cell fusion. His work focused on SNAREs, soluble *N*-ethylmaleimide-sensitive fusion protein attachment protein receptors.

MBC plans additional talks in the series.

MBC Welcomes New Faculty

MBC welcomes three new faculty members: Dr. Darrell R. Galloway, Adjunct Professor, of the Naval Medical Research Center; Dr. Terry B. Rogers, Affiliate Professor, UMB Department of Biochemistry & Molecular Biology; and Dr. Yibin Wang, Affiliate Assistant Professor, UMB Department of Physiology.

Dr. Galloway is a naval officer and an expert in biodefense and microbiology. He is a collaborator of Dr. Les Baillie and part of MBC's new Biodefense Initiative headed by Dr. Baillie.

Dr. Rogers is an expert in cellular signaling in heart cells and focuses on how phosphatases and kinases affect the calcium concentration in the heart. He is head of UMB's M.D./Ph.D. program. Dr. Rogers and Dr. W. Jonathan Lederer have been active collaborators for many years.

Dr. Wang is a molecular geneticist at UMB who studies the stress-activated cJun kinase (JNK) pathway in heart. He creates and uses transgenic mice and has made use of the UMBI transgenic facility. JNK has been implicated in a number of stress related diseases, including heart disease.

The appointment of these three investigators continues MBC's tradition of reaching out to form productive collaborations, strengthening our own research efforts and those of our USM sister institutions.

A Glowing Report

The Center for Fluorescence Spectroscopy's 2002 course was in full swing March 26-29, with 86 participants from all over the US and Europe. This annual course combines lectures with hands-on learning of state-of-the-art fluorescence techniques. The participants hope to apply their new-found or enhanced skills in myriad scientific fields. Vendors of the high tech instrumentation needed for this type of spectroscopy and imaging set up their wares throughout MBC in support of this course. Dr. Joseph Lakowicz, his laboratory and Mary Rosenfeld, academic coordinator, should be congratulated on the extraordinary success of this annual event.

Two course participants were from MBC, Drs. Long-Sheng Song and Silvia Guatimosim, taking advantage of the course's proximity. Dr. Song was very enthusiastic about the course, noting that both basic principles and advanced techniques were covered; he was particularly interested in the multiphoton techniques. He said that he could really apply what he had learned immediately and that "Dr. Lakowicz was a very good teacher." Dr. Guatimosim agreed, saying that the course was "definitely worth taking."

The CSF is already hard at work preparing for next year's offering. It is also helping organizers of a similar, European course to set up and advertise the new program that it designed.



First Class Effort

While our faculty are known to mentor graduate students and post-doctoral fellows, few know that they also mentor high school students. One of the most promising is Jamie Miller, currently working in Dr. Mervyn Monteiro's laboratory. Jamie, a student at the prestigious Baltimore Polytechnic Institute, has won first place in the annual Baltimore Science Fair. The fair, held at Towson University, brings together winners from middle and high schools throughout the city and county to compete. Jamie won with her poster entitled: "Cellular Expression of Ubiquitin Isoforms: A Presenilin Interactor Involved in Alzheimer's Disease." Jamie, who graduates this year, will be going to UMBC on scholarship.



Symposium continued.

President of Research at Maxygen; Dr. Leonard Guarente, Novartis Professor of Biology, MIT; Dr. Richard Flavell, Chair of the Department of Immunobiology, Yale University; and Dr. Samuel Broder, Executive Vice President for Medical Affairs, Celera Genomics. In addition to Dr. Monteiro, UMBI was also represented on the organizing committee by Dr. Peter Melera, MBC Affiliate Professor and Director of the MCB Graduate Program, and Dr. Rosemary Jagus from COMB. Student Jing Liang and rotation students, Dana Hartzman and Leann Massey, from Dr. Monteiro's laboratory volunteered, manning the registration table, programs and ushering.

The Molecular and Cell Biology Graduate Program is one of several with which MBC is associated. It is the various graduate programs that allow our faculty to mentor students, as UMBI is not a degree granting institution. Though not mandatory, our faculty's voluntary participation and fiscal support of graduate students benefits both UMBI and her USM sister institutions.

MBC Happenings

Comings and Goings

MBC welcomes Shannon Geddes born April 2, 2002 to **Dr. Chris Geddes** and his wife, Caroleann.

Grants and Contracts

Dr. Joe P.Y. Kao, NIH, NIGMS, "Spatiotemporal Control of Gene Expression with Light." 3/1/02, \$111,375, yr 1 of 2.

Dr. Bruce Vogel, NIH, NIGMS, "The Molecular Genetics of Hemocytin." 4/1/02, \$249,480, yr 1 of 4.

Dr. Les Baillie, TIGR, MOU, "To Define Diagnostic and Therapeutic Targets for Biowarfare Agents." \$130,000, 2 years.

Dr. Joseph Lakowicz, NIH, "Center for Fluorescence Spectroscopy." \$1,243,122 (UMB), yr 1 of 5.

Dr. Joseph Lakowicz, NIH, "Annual Meeting of the NCRR P41 Principal Investigators." \$73,311 (UMB) yr 1 of 5.

Publications

Shao ZH, Vanden Hoek TL, Qin YM, Becker LB, Schumacker PT, Li CQ, Dey L, Barth E, Halpern H, **Rosen GM**, Yuan CS. Baicalein attenuates oxidant stress in cardiomyocytes. *AM J PHYSIOL HEART CIRC PHYSIOL* 282 (3):H999-H1006 MAR 2002.

Kusba J, Li L, **Gryczynski I**, Piszczek G, Johnson M, **Lakowicz JR**. Lateral diffusion coefficients in membranes measured by resonance energy transfer and a new algorithm for diffusion in two dimensions. *BIOPHYSICAL J* 82 (3):1358-1372 MAR 2002.

Neves-Petersen MT, Gryczynski Z, **Lakowicz J**, Fojan P, Pedersen S, Petersen E, Petersen SB. High probability of disrupting a disulphide bridge mediated by an endogenous excited tryptophan residue. *PROTEIN SCI* 11 (3):588-600 MAR 2002.

Gryczynski I, Malicka J, Shen YB, Gryczynski Z, **Lakowicz JR**. Multiphoton excitation of fluorescence near metallic particles: Enhanced and localized excitation. *J PHYS. CHEM B* 106 (9): 2191-2195 MAR 7 2002.

Karpman D, Bekassy ZD, Sjogren AC, Dubois MS, Karmali MA, Mascarenhas M, Jarvis KG, Gansheroff LJ, O'Brien AD, Arbus GS, **Kaper JB**. Antibodies to intimin and Escherichia coli secreted proteins A and B in patients with enterohemorrhagic Escherichia coli infections. *PED. NEPHROL.* 17 (3):201-211 MAR 2002.

Li CYC, Merrell DS, Camilli A, **Kaper JB**. ToxR interferes with CRP-dependent transcriptional activation of ompT in Vibrio cholerae. *MOL. MICROBIO.* 43 (6): 1577-1589 MAR 2002.

Kang JS, Abugo OO, **Lakowicz JR**. Dynamics of supercoiled and linear pTZ18U plasmids observed with a long-lifetime metal-ligand complex. *BIOPOLYMERS* 67 (2):121-128 2002.

Chen QR, Zhang L, **Luther PW**, Mixson AJ. Optimal transfection with the HK polymer depends on its degree of branching and the pH of endocytic vesicles. *NUCL ACIDS RES* 30 (6):1338-1345 MAR 15 2002.

Judge SIV, Yeh JZ, Goolsby JE, **Monteiro MJ**, Bever CT. Determinants of 4-aminopyridine sensitivity in a human brain Kv1.4 K⁺ channel: Phenylalanine substitutions in leucine heptad repeat region stabilize channel closed state. *MOL PHARM* 61 (4):913-920 APR 2002

Harms P, Kostov Y, **Rao G**. Bioprocess monitoring. *CURR OPIN BIOTECH* 13 (2): 124-127 APR 2002.

Kang JS, **Lakowicz JR**, Piszczek G. DNA dynamics: a fluorescence resonance energy transfer study using a long-lifetime metal-

Bers continued.

relaxation was increased. This can explain the observed contractile dysfunction. The model suggests that the sodium-calcium exchanger competes better for SR calcium only during relaxation, which is supported by voltage clamp experiments and an increase in the mRNA, protein concentration and function of the exchanger.

Dr. Bers compared this explanation to one put forth by Dr. Andrew Marks' laboratory which hypothesizes that it is calcium leaking from the resting SR due to increased ryanodine receptor (RyR) phosphorylation that reduces SR calcium and causes the dysfunction. While Dr. Bers' conclusions differed from those of the Marks' group about the cause of the SR Ca²⁺ loss, the models of disease and methods of investigation were different. Dr. Marks spoke earlier this year in a joint seminar by the Department of Physiology, Division of Cardiology and the UMB Center for Cardiovascular and Renal Studies. Additional seminars sponsored by the Institute of Molecular Cardiology of the MBC are planned for the fall.

ligand complex. *ARCH PHARMACAL RES* 25 (2):143-150 APR 2002.

D'Auria S, DiCesare N, Staiano M, Gryczynski Z, Rossi M, **Lakowicz JR**. A novel fluorescence competitive assay for glucose determinations by using a thermostable glucokinase from the thermophilic microorganism *Bacillus stearothermophilus*. *ANAL BIOCHEM* 303 (2):138-144 APR 15 2002.

DiCesare N, **Lakowicz JR**. Chalcone-analogue fluorescent probes for saccharide signaling using the boronic acid group. *TETRAHEDRON LETS* 43 (14):2615-2618 APR 1 2002.

Rosen GM, Tsai P, Pou S. Mechanism of free-radical generation by nitric oxide synthase. *CHEM REV* 102 (4):1191-1199 APR 2002.

Giron JA, Torres AG, Freer E, **Kaper JB**. The flagella of enteropathogenic *Escherichia coli* mediate adherence to epithelial cells. *MOL MICROBIO* 44 (2):361-379 APR 2002.

Piszczek G, **Gryczynski I**, Maliwal BP, **Lakowicz JR**. Multiphoton sensitized excitation of near infrared emitting lanthanides. *J FLUOR* 12 (1):15-17 MAR 2002

McCardell BA, Sathyamoorthy V, Michalski J, Lavu S, Kothary M, Livezey J, **Kaper JB**, Hall R. Cloning, expression and characterization of the CHO cell elongating factor (Cef) from *Vibrio cholerae* O1. *MICROBIAL PATHOGENESIS* 32 (4):165-172 APR 2002

Kang JS, Piszczek G, **Lakowicz JR**. Enhanced emission induced by FRET from a long-lifetime, low quantum yield donor to a long-wavelength, high quantum yield acceptor. *J FLUOR* 12 (1):97-103 MAR 2002

Talks and Travels

W. J. Lederer 3/14-17/02, Joint meeting of the United Kingdom, German and Scandinavian Physiological Societies, Tübingen, Germany, "Calcium Sparks in Health and Disease."

Les Baillie 4/20/02, Wessex Applied Microbiology Meeting, Southampton, UK, "*Bacillus anthracis*, a bug with Attitude."

Less Baillie 4/23/02, Anthrax Vaccines: Efficacy Testing and Surrogate Markers of Immunity Workshop, Bethesda, MD, "The Mouse Model of Anthrax."