



Inside MBC

"...molecular medicine through biotechnology"

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UMBI in Annapolis

With the legislative session in full swing, President Hunter-Cevera and the Center Directors are making sure that the legislature remembers us. On January 23, the UMBI Board of Visitors hosted a reception and dinner for all the delegates and senators. The reception included a drama with comic interludes about biotechnology called "Honey & Sting" presented by BAPA's Imagination Stage, and sponsored by MDBio, Inc. The reception was well attended and allowed UMBI's senior staff to interact with legislators informally.

The formal meetings came in two committee meetings at which President Hunter-Cevera and the Center Directors were "invited" to testify. The Senate Committee on Education, Business and Administration met on February 28. The House of Delegates Committee on Economic Development would meet March 7th. These committees make recommendations for budget expenditures that are crucial for expanding UMBI. Helping legislators learn more about biotechnology and scientific research issues and reminding them of the economic benefits of our work is also part of our job



Bioterrorists Beware!



The latest addition to the MBC faculty is Dr. Les Baillie, an expert in biodefense and microbiology of anthrax. He will be chief of the MBC Biodefense Initiative. He had previously given a seminar on the topic to the MBC in September of 2001 (See *Inside MBC*, Vol. 4, No. 5). A newcomer to academia, Dr. Baillie has spent most of his career in government laboratories in the United Kingdom and looks forward to pursuing his own research path. From his position at the MBC, he will collaborate widely and continue a long standing collaboration with the U.S. Office of Naval Research. He will work with The Institute of Genomic Research (TIGR) in Rockville to sequence the *Bacillus anthracis* genome.

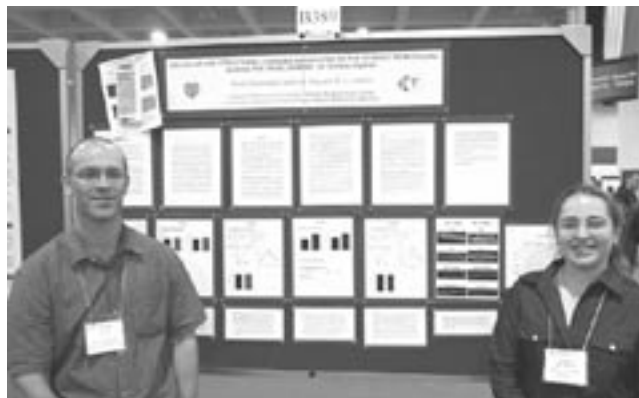
Dr. Baillie received his M.Phil. from the University of the West of England and a Ph.D. from the University of Sheffield. He holds several UK patents on anthrax vaccine development. He is well known

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Cells, Lasers and Cable Cars

The annual meeting of the Biophysical Society met in San Francisco, February 23-27. MBC participants included Dr. Ilia Baskakov, Drs. Abdul Ruknudin and Daniel Schulze, who together presented a poster, and Drs. Ignacy Gryczynski and Joseph Lakowicz, who jointly had two posters. Dr. W. Jonathan Lederer's laboratory, including Drs. Eric Sobie, Keith Dilly and Silvia Guatimosim, was very visible with three posters.

This meeting is the premier gathering of biophysicists around the world. The topics are far-reaching and high tech, including such diverse subjects as Atomic Force Microscopy, Unconventional Myosins and the Ins and Outs of Ligand Gating. Nobel prize winners mingle with students and



Keith Dilly and Silvia Guatimosim, Postdoctoral Fellows in

Dr. Lederer's laboratory are shown in front of their poster.

Transferred Technology in Our Midst



*Al Kraus, President and
CEO, NOvoVascular*

One of the goals of UMBI is the transfer of intellectual property and technologies developed by our faculty to the private sector. This may be done via licensing to an existing firm or by starting a new company based on the research. MBC is home to one such, called NOvoVascular. NOvoVascular is housed in the MBC's incubator space. The founders of this company are Drs. William Herzog, Barry Handwerger, John Sadler and MBC's own, Gerald M. Rosen. The six-year old company is based on the development of nitric oxide-releasing compounds encapsulated within polymer coatings. Nitric oxide (NO) is known to inhibit blood clotting, tissue growth and bacterial infection. The company is developing technology that will allow medical devices to be coated with these compounds, thereby making them less susceptible to infection and less likely to induce clotting. Dialysis tubing, catheters, cardiac stents and many other devices which are either implanted or otherwise come in contact with the body are well-known to increase infection, induce unwanted clots or generally cause complications in already weakened patients. Reducing these complications would decrease suffering and lower medical costs. The company is just beginning human trials but preliminary findings look very good.

The company currently consists of Al Kraus, President
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Biophysics continued.

career opportunities abound. The excitement of discovery in this kind of meeting is what makes it so important for MBC faculty members and members of their laboratory to participate and show off their work.

This year's meeting was particularly special for MBC, as Dr. Lederer was formally installed as a Fellow of the Society at the Awards Ceremony on February 25th, followed by the President's Reception. Only thirteen fellows were chosen this year, out of a membership of thousands worldwide. It is a tribute to Dr. Lederer's cutting edge work in cellular calcium signaling and cardiac electrophysiology.

Dr. Lederer has been active in the Biophysical Society for over 25 years, having served on the executive committee and organized several symposia for the Society. This year, as has been true for about 15 years, he was part of the group sorting through 3000 abstracts submitted for the meeting.

Biophysical Abstracts from MBC

Gryczynski I, Piszczek G, Gryczynski Z, **Lakowicz JR**. "Four-photon excitation."

Guatimosim S, Dilly K, **Lederer WJ**. "Cellular and structural changes associated to the cardiac remodeling during the development of hypertrophy."

Jafri MS, **Sobie EA**, **Lederer WJ**. "Modeling the effects of sarcoplasmic reticulum lumenal and subspace calcium on spontaneous spark rate in cardiac myocytes."

Lakowicz JR, Shen YB, D'Auria S, Malicka J, Gryczynski Z, **Gryczynski I**. "Radiative decay engineering: Biophysical applications."

Ruknudin A, **Schulze D**. "Characterization of the bacterial calcium exchanger."

Sobie EA, Jafri MS, **Lederer WJ**. "Modeling cardiac Ca^{2+} sparks: Influences on the Ca^{2+} spark shape."

All of these abstracts can be found in the Biophysical Journal, Volume 82, January, 2002.



*Dr. W. Jonathan Lederer,
above, and Dr. Eric Sobie,
right, discuss their respective
posters.*

Annual Report Out

UMBI's Annual Report came out the beginning of February. This is the second report since the arrival of Dr. Hunter-Cevera and one of the most important ways that UMBI disseminates information about what UMBI



does. The report goes to other system institutions, the legislature, prospective students and postdoctoral fellows, other public officials, industrial leaders and the news media, among others. Last year the MBC laboratories of Drs. W. Jonathan Lederer, Marian Jackson and Mervyn Monteiro were highlighted. This year Drs. Joseph Kao, Bruce Vogel and Ilia Baska-

kov were in the limelight. The report includes lists of publications and grants from all five centers. Copies of the reports, from this year and last, are available in the main MBC office.

Les Baillie continued.

as the organizing chair of an international conference called *Dangerous Pathogens*, the first held in 2000 and the second coming on September 9-11, 2002, as well as, a series of conferences on anthrax.

The Medical Biotechnology Center is well equipped to handle all aspects of Dr. Baillie's research, having a state-of-the-art, secured bio-containment facility. Dr. Baillie is particularly interested in the ecology of anthrax and in environmental detection, research areas sadly neglected. The so-called weapons-grade anthrax is not expected to be part of his research effort here.

Dr. Baillie's arrival is the start of a new UMBI and MBC initiative into biodefense, an area of great interest to UMBI President Jennie Hunter-Cevera. This will be a multi-center endeavor. With the current national interest in the area, the unique combination of scientific fields available in UMBI, combined with Dr. Baillie's experience should make this initiative a success.

The entire MBC community welcomes Dr. Baillie and this new initiative into biodefense.

Did you know that MBC faculty members published over 75 peer-reviewed articles in 2001? This included two in Science, one in Nature and 2 in PNAS!

Tricks of the Trade

By Pamela Wright

JPEG, TIFF, BMP, AI, PSD, GIF, CDR, PDF etc. etc. Confused yet? All of these acronyms refer to graphic file formats. Formats define the dataset of computer code to display or print a file correctly. Formats actually come in two types: application specific or non-application specific. If you create a graphic in Adobe Illustrator or CorelDraw, it will automatically be saved in an application specific format. On PCs, this will be indicated by a two- or three-character "extent" on the end of the file name and an application specific icon; on a Mac, only the icon will be there, unless the user tacks on an extent. Thus, [name].AI indicates Illustrator, CDR CorelDraw and so on. To save in any other format, you must choose from the list in the save window.

While many of the drawing programs can read a file saved from another drawing programs, non-drawing programs often cannot. To import graphics into word processing programs, usually the file must be saved in a non-application specific format like JPEG or TIF. These file formats were created to standardize graphic handling for the Web and professional printers. Each one has its strengths and weaknesses. The table below describes some of the common formats.

| | | |
|-------------|----------------------------------|--|
| JPEG or JPG | Joint Photographers Expert Group | Widely used format for professional printers and Web graphics; use whenever there is any doubt about compatibility |
| GIF | Graphic Image File | Used primarily on the Web for simple drawings with limited colors |
| TIF | Tagged Image Format | Large, detail-rich file; limited use due to large size; mainly for professional printers |
| BMP | Bit-mapped files | The original "paint" files; small, simple but detail poor; good for screen pictures |
| EPS | Encapsulated Post-Script | The original Adobe graphic format but tends to import poorly |
| PDF | Post-script Delineated File | Not just for graphics; the universal file format from Adobe for file exchange without complications from application incompatibilities |
| PPT | PowerPoint | Not a true drawing program, low resolution presentation files; not suitable for professional printers |

Graphic files can also be vector or rasterized. Vector graphic files (i.e. Illustrator, EPS, PPT) are created with "objects" which can be handled individually and have an order to them (i.e. one object can be in front of another). Rasterized or "paint" files (all the other formats above) are generally only one "pixel" or dot thick. When you change an area, you replace what was there before. *Choosing the right format can save a lot of trouble in the long run.*

MBC Happenings

Comings and Goings

Dr. Eric Sobie has been promoted to Assistant Professor in Dr. W.J. Lederer's laboratory.

Grants and Contracts

Joseph Lakowicz, American Diabetes Association, "Enzymes and Proteins from Thermophilic Organisms as Nonconsuming Glucose Sensors" 1/1/02, \$96,741, Year 2.

Mervyn Monteiro, NIA, NIH, "Function of Alzheimer Disease Presenilin 2" 2/1/02, \$248,225, year 3 of 5.

Publications

Shen Y, Maliwal BP, **Lakowicz JR**. Long-lived luminescent Re(I) complexes containing cis-carbonyl and bidentate phosphine ligands. *J FLUOR* 11 (4): 315-318 DEC 2001.

Olsen O, Liu H, Wade JB, Merot J, **Welling PA**. Basolateral membrane expression of the Kir 2.3 channel is coordinated by PDZ interaction with Lin-7/CASK complex. *AM J PHYSIOL-CELL PHYSIOL* 282: C183-C195 JAN 2002.

Dubell WH, Gigena MS, Guatimosim S, Long XL, **Lederer WJ**, Rogers TB. Effects of PP1/PP2A inhibitor calyculin A on the E-C coupling cascade in murine ventricular myocytes. *AM J PHYSIOL-HEART CIRC PHYSIOL* 282:H38-H48 JAN 2002.

Okeke IN, Steinruck H, Kanack KJ, Elliott SJ, Sundstrom L, **Kaper JB**, Lamikanra A. Antibiotic-resistant cell-detaching *Escherichia coli* strains from Nigerian children. *J CLINICAL MICROBIO* 40 (1): 301-305 JAN 2002

Thompson RB, **Gryczynski I**, Malicka J. Fluorescence polarization standards for high-throughput screening and imaging. *BIO-TECHNIQUES* 32 (1): 34+ JAN 2002

Gryczynski I, Piszczek G, Gryczynski Z, **Lakowicz JR**. Four-photon excitation of 2,2'-dimethyl-p-terphenyl. *J PHYSICAL CHEM A* 106 (5): 754-759 FEB 7 2002

Sperandio V, Torres AG, **Kaper JB**. Quorum sensing *Escherichia coli* regulators B and C (QseBC): a novel two-component regulatory system involved in the regulation of flagella and motility by quorum sensing in *E. coli*. *MOL MICROBIO* 43 (3): 809-821 FEB 2002

Delahay RM, Shaw RK, Elliott SJ, **Kaper JB**, Knutton S, Frankel G. Functional analysis of the enteropathogenic *Escherichia coli* type III secretion system chaperone CesT identifies domains that mediate substrate interactions. *MOL MICROBIO* 43 (1): 61-73 JAN 2002

Heimer SR, Welch RA, Perna NT, Posfai G, Evans PS, **Kaper JB**, Blattner FR, Mobley HLT. Urease of enterohemorrhagic *Escherichia coli*: Evidence for regulation by Fur and a trans-acting factor. *INFECT IMMUN* 70 (2): 1027-1031 FEB 2002

DiCesare N, **Lakowicz JR**. New sensitive and selective fluorescent probes for fluoride using boronic acids. *ANAL BIOCHEM* 301 (1): 111-116 FEB 1 2002

Zhu WY, **Melera PW**. Basal levels of metallothionein I and II expression in mouse embryo fibroblasts enhance growth in low folate through a cell cycle mediated pathway. *CELL BIO ITNL* 25 (12): 1261-1269 2001

Lakowicz JR, Shen YB, D'Auria S, Malicka J, Fang JY, Gryczynski Z, **Gryczynski I**. Radiative decay engineering 2. Effects of silver island films on fluorescence intensity, lifetimes, and resonance energy transfer. *ANAL BIOCHEM* 301 (2): 261-277 FEB 15 2002.

NOvoVascular continued.

dent and CEO, Yi-Ju Zhao, MD, Senior Scientist and Miriam Lazur, Project Leader. They have been renting incubator space on the second floor for 4 years. This has been particularly convenient as it keeps the company in close proximity to the founders. Being in a university setting is also good for the company's credibility, according to Mr. Kraus, besides having well-designed facilities in which to work. Mr. Kraus had not worked in an academic setting before but was amazed at the breadth of work being conducted at UMBI and UMB. He also noted that he thought not enough of it was really getting put to use in the private sector.

The most difficult part of starting a company is attracting start-up funds. NOvoVascular has received a number of grants, including a Small Business Innovative Research grant from the National Institute of Aging and a Maryland Industrial Partnerships grant, loans from the Abel Foundation and the Maryland Health Care Product Development Corporation, and private investors. Medical device manufacturers are also supporting the research.

The road from the research bench to operating room is rather torturous but NOvoVascular seems to be navigating it with success. No matter where they go from here, MBC will have had a small part in getting this promising work out into the economy and helping future patients.

UMBI Hosts Nobel Laureates

Members of the UMBI community had an opportunity to mingle with Baltimore-Washington area Nobel Prize winners on February 14th at a reception held at CARB. Countess Sonja Bernadotte, President of the Meetings of Nobel Laureates in Lindau, Germany, and UMBI President Jennie Hunter-Cevera hosted the reception. Each year 500 or so students from around the world experience a week of lectures and informal discussion with 20 or more Nobel Laureates in Lindau. For more information, their web site is www.nobel-lindau.de. Dr. Kevin ("Kit") Parker, a postdoctoral fellow working with Dr. W. J. Lederer and Dr. Leslie Tung (Johns Hopkins University), attended the reception from MBC.

Albano CR, Lu CH, Bentley WE, **Rao G**. High throughput studies of gene expression using green fluorescent protein-oxidative stress promoter probe constructs - The potential for living chips. *J BIOMOL SCREENING* 6 (6): 421-428 DEC 2001

Talks and Travels

W. J. Lederer 2/7/02, University of Connecticut, Farmington, Conn., Chair of the Advisory Committee the NIH sponsored Center for Computational Biology.

Iliia Baskakov 2/28/02 Invited Speaker, Stanford University, Dept. of Applied Physics "Complexity of misfolding pathways of the prion protein"