INSIDE MBC

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MEDICAL BIOTECHNOLOGY CENTER -UNIVERSITY OF MARYLAND BIOTECHNOLOGY INSTITUTE

Inside:

No Milk, Please

Scientific research sometimes seems miles away from everyday life, but upon occasion life and science come together. Take the British love of tea, for instance. MBC scientists and British ex-pats, Les Baillie and Theresa Gallagher, in part out of simple curiosity, decided to test the effect of tea on the very lethal organism they study everyday, *Bacillius anthracis* or anthrax. To their surprise anthrax didn't like tea! In fact, good old English Breakfast tea could knock the socks off a culture in less than an hour!

The work was reported in the March issue of the *Microbiologist*. The beneficial effects of tea have been studied and touted for centuries and there is solid evidence that tea comes with a variety of useful chemicals. Dr. Gallagher and Dr. Baillie, who is now back in the UK at Cardiff University, decided to see if the effects noted with other organisms would have any effect on the notoriously hardy anthrax bacillus. It did, but their work had several surprising findings.

- Wouldn't you think that the stronger the tea, the better? Not so. No need to double up on tea bags, one is just the right amount.
- Milk is a no-no. The British tend to add milk to tea which totally destroys the beneficial effects.

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Behind the Headlines

The Baltimore Examiner (the new daily newspaper) ran a story on student intern Rushi Talati and his work with stem cells in Dr. W. Jonathan Lederer's laboratory (March 4, 2008; based on *Inside MBC*, Vol. 8 No. 3). Rushi's early work generated some of the preliminary data for Dr. Lederer's large stem cell grant that was awarded last year (*Inside MBC*, Vol. 10 No. 3). Though the story in the Examiner was interesting and accurate, it was not really the whole story. It actually starts well before Rushi and Dr. Lederer entered the picture.

Most work on stem cells focuses on the ability of these cells to change into whatever kind of differentiated cell is required—heart, skin, lung, etc. The work that was funded centers on the observation that the addition of adult stem cells can be protective well before they differentiate into specific cell types. The story of the original observation demonstrates the connectedness of scientific

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UMBI News

VP for Institutional Development Leaves

David Bobbitt, UMBI's first Development Director and VP for Institutional Advancement, has left to do fund raising for the National Kidney Foundation.

New Spam Controls Tested

Email users may have noticed new labels on some emails. Spam and Suspected Spam labels are now being added as UMBI's Office of Information Technology begins testing a new spam control system. Users need to notify either OIS or their ISAB representative of missed spam and mislabeled spam problems. The new system will not be implemented until all the glitches are worked out. Many users prefer to sort through their own spam or use their own filtering settings. Contact Mike Kelly or Pamela Wright, MBC's ISAB members with concerns.

Happy Birthday, Dr. Hunter-Cevera

Well wishers flocked to the Columbus Center on March 4 to wish UMBI's President Dr. Jennie Hunter-Cevera a happy sixtieth birthday. MBC gave her a large poster card of an eagle (UMBI's mascot) signed by everyone at the MBC.

BOV Member Visits MBC

Dr. John Holaday, a member of UMBI Board of Visitors), visited MBC on March 13, 2008, accompanied by Drs. Ted Roumel (UMBI V.P. Research, Innovation & Commercialization) and Gene Levinson (UMBI, Director of Communications). Dr. Holaday met one-on-one with MBC faculty, Drs. W. Jonathan Lederer, Mervyn Monteiro, Ilia Baskakov, Shengyun Fang and Bruce Vogel. The goal of the visit was to give Dr. Holaday a deeper understanding of the research being undertaken at the MBC.

Dr. John Holaday is well-known in biotech circles, being the co-founder and Chairman of HarVest Bank of Maryland which specializes in funding biotech. He is also the founder of EntreMed, Inc. and served as its Chairman, President and Chief Executive Officer and a Director until his retirement in 2003. Dr. Holaday is also the co-founder of Medicis Pharmaceutical Corp., as well as MaxCyte, Inc. He has also served as a member of the Board of Directors of CytImmune Sciences, BSI Proteomics, Rexahn and LabBook.

Dr. Holaday (left) with MBC Director W. J

Congratulations!

Andria Apostolou, mentored by Dr. Shengyun Fang, defended thesis "SUPRESIN, a UPR-upregulated protein, inhibits cell proliferat and ER stress-induced cell death" on March 28.

Dr. Joseph Kao was named a semi-finalist for the Christopher Columbus Fellowship Foundation Distinguished Life Sciences Award

Dr. Petek Ballar, who graduated last fall from Dr. Shengyun Fan laboratory, won the Biochemical Journal Young Investigator Award from the Third Intracellular Proteolysis Meeting, a joint meeting of th INPROTEOLYS network and the UK Biochemical Society held in Ter Spain on March 5-7, 2008. The award included a cash prize and a nic write-up on the Biochemical Journal's web page.

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

Publisher: W. Jonathan Lederer, Director MBC
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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Drs. Pati and Khakoo

endeavors and the unexpected paths research often takes to yield results. This particular path actually started with two researchers who happened to be married, Drs. Shibani Pati and Aarif Khakoo.

In 2001, Shibani Pati was a graduate student in the laboratory of Dr.Marvin Reitz at the Institute of Human Virology. When she finished, she remained with him as a post-doctoral fellow. The focus of Dr. Reitz's laboratory is the study of Kaposi's Sarcoma (KS). It was during this time (early 2000s) that a number of groups had begun to work on bone marrow derived stem cells also known as mesenchymal stem cells (MSCs), and many exciting papers on their potential to differentiate into multiple lineages were being published. Her first exposure to stem cell biology began when she was assigned the task of presenting two such papers for the IHV Journal Club. This task introduced her to the growing understanding of the therapeutic potential of stem cells. Her husband, Aarif Khakoo, then an internal medicine resident at Johns Hopkins Bayview Medical Center, also became interested, and together they explored the field's burgeoning literature in depth. When Aarif became a cardiology fellow in the joint Johns Hopkins/NHLBI fellowship program, he decided that he wanted to focus his research on using stem cells as a gene delivery system for the treatment of heart disease, and in 2002, he joined the lab of Dr. Toren Finkel at the NIH/NHLBI.

By 2003, these two young researchers were both fellows pursuing research in their respective labs, her work focusing on tumor angiogenesis and his work focusing on stem cells in the heart. During that year, they started to discuss how stem cells might also be used in the treatment of human malignancies. Over several long discussions, they formulated a plan to test the hypothesis that MSCs could be used to deliver anti-angiogenic genes with therapeutic potential in the treatment of KS. They approached their mentors, Dr. Reitz and Dr. Finkel, who were strongly supportive of the collaboration. They used Dr. Reitz's mouse model of Kaposi's Sarcoma for these studies. To everyone's surprise they found that MSCs alone could inhibit KS tumor growth. These findings were published in the Journal of Experimental Medicine in 2006 with the two of them as co-first authors. Their work with Dr. Terry Rogers and Dr. W. J. Lederer began during this time as well, when they realized that many of the effects of MSCs were cell type specific. Other groups had shown that MSCs may improve cardiac function in models of heart failure and myocardial infarction *in vivo*. With this in mind, Shibani and Aarif sought to determine what the effects of MSCs were on cardiomyocytes and initially worked with Dr. Terry Rogers and Gentzon Hall, an MD PHD, student in Dr. Rogers laboratory. This early work was also part of the Journal of Experimental Medicine paper demonstrating the effects of MSCs on different cell types and was used as preliminary data (along with that produced by Rushi Talati) in the Maryland Stem Cell grant awarded to Dr. Lederer along with Dr. Terry Rogers and Aarif.

J. Lederer

In 2005, the two of them moved to Houston when Aarif took a job as a physician-scientist in the Department of Cardiology at The University of Texas MD Anderson Cancer Center. His laboratory studies the mechanism of cardiotoxicity of anti-cancer drugs. He is also interested in the therapeutic potential of stem cells in the treatment of chemotherapy induced and other forms of cardiac disease. While Aarif set up his laboratory, Shibani has been working on stem cells and their therapeutic potential after brain injury in the Department of Neurobiology and Anatomy at the University of Texas, Houston. She will be joining that department as a faculty member in the fall and plans to continue this work. According to Shibani, "Aarif and I really enjoyed working together. We were a bit sad when it was over. It was a very exciting time and we continue to collaborate on stem cell related research projects."

Both of these young researchers would like to emphasize the roles of Dr. Marvin Reitz and Dr. Toren Finkel in this whole project. As their mentors at the time, these senior scientists, as well as the institutions with which they were associated, were the ones who provided the support, guidance and creative freedom to pursue this work. But who knew that a journal club presentation would lead to an entirely new avenue of research!

MBC Happenings

Comings and Goings

Deepa Srinivansan joined Dr. Monteiro's laboratory as a Research Assistant. Research Associate Dr. Hui Yang left Dr. Fang's laboratory to return to her native China. Dr. Michael Previte, Research Associate with Dr. Geddes, took a position at the Smithsonian Institution in Washington, D.C.

Grants and Contract

Dr. Bruce Vogel, NSF, "Assembly and Composition of Elastic Fiber-like Structures in the Nematode C. elegans," $159,999, 3/1/08, yr 1 of 5.

Publications

Geddes CD. The journal of fluorescence expands further with new regional editors. J Fluoresc. 2008 Mar;18(2):237.

Keller M, Kao JP, Egger M, Niggli E. Calcium waves driven by "sensitization" wave-fronts. Cardiovasc Res. 2007 Apr 1;74(1):39-45.

Talks and Travels

Dr. Valeriy Lukyanenko, seminar speaker, "Subcellular calcium in ventricular myocytes", Texas A&M Health Science Center, Department of Systems Biology and Translational Medicine, February 13, 2008.

Dr. Mervyn Monteiro, seminar speaker, "Preventing stress: Lessons from a trip to the ER," Department of Biochemistry and Molecular Biology, University of Maryland School of Medicine, March 3, 2008.

Dr. Chris D. Geddes, speaker, "Microwave-Accelerated Metal-Enhanced Highly Multiplexed Bioagent assays," MARCE regional meeting, Turf Valley, MD, March 6, 2008.

Dr. Chris D. Geddes, speaker, "Metal-enhanced Fluorescence: A paradigm shift in the way we both think and use fluorescence spectroscopy," Northwest Regional Cytometry Meeting, Portland, OR, March 15, 2008.

Dr. Valeriy Lukyanenko, seminar speaker, "Therapeutic Nano-Object Delivery in Heart Failure", Jefferson University School of Pharmacy, Department of Pharmaceutical Sciences, March 27, 2008.

Dr. Mervyn Monteiro, Center for Vascular and Inflammatory Diseases, University of Maryland School of Medicine, "A novel complex involved in ER-associated degradation," April 2, 2008.

Dr. Chris D. Geddes, Department of Epidemiology, University of Maryland School of Medicine, "Metal-enhanced Fluorescence: A paradigm shift in the way we both think and use Fluorescence," April 4, 2008.

Dr. Mervyn Monteiro, Department of Biochemistry and Molecular Biology, Howard University School of Medicine, "Taking out the Garbage: The role of Novel Ubiquitin-Containing Proteins in the Disposal of Misfolded Proteins in Cells." April 10, 2008.

Dr. Chris D. Geddes, Bio–Rad, Hercules, Berkley, CA, "Plasmonic Nanohole Arrays for Multiplexed Sensing," April 24, 2008.

Bits and Pieces

• Dr. Dan Hebert from Department of Biochemistry and Molecular Biology, University of Massachusetts gave a seminar on March 12, 2008 entitled "The translocation of viruses and their components across cellular membranes." Dr. Shengyun Fang was the host.

• Dr. Bruce Logan from Department of Civil and Environmental Engineering, Pennsylvania State University gave a seminar on March 19, 2008 entitled "Bioelectricity or biohydrogen production using microbial fuel cell technologies." This seminar was broadcast via IVN to all of UMBI. Dr. Ilia Baskakov was the host.

• Mike Lally, Vice President for Business Development at Biotage AB, a scientific products company in Sweden, visited Dr. Chris Geddes on March 26, 2008. Other attendees included Jonathan Gottlieb and Shaun Koeing (UMBI, ORD), and Tim Hughes (MBC Assistant Director). Biotage is interested in the biosensing work being done in the Institute of Fluorescence

• Dr. Ron Lynch from the University of Arizona gave a seminar on April 18, 2008 entitled "Finding needles in a haystack: Imaging and analysis of nutrient sensing cells." This is a joint seminar with the Maryland Center for Heart, Hypertension and Kidney Disease, University of Maryland School of Medicine.

Tea continued

Americans are less addicted to "white tea;" however, the effect of sugar was not studied, though Dr. Gallagher has promised to look into that. This author cannot be the only one especially fond of really sweet tea.

• Boiling water is a must-—not only for decent cup of tea but to enhance the spore killing ability.

• Starbucks will not substitute for Twinings. Coffee just doesn't match tea for effectiveness. However, many Americans think that the British have no clue how to make a good cup of coffee, so these data may be suspect. More research is needed to solve this diplomatic dilemma.

Drs. Gallagher and Baillie have shown that there is something to those old folk remedies recommended by grandmothers everywhere that may lead to some very useful and modern therapeutics in a dangerous world. So in case of attack, put the kettle on and relax, just remember "No milk, please."