Volume 14, Number 6
November-December 2011

Inside:

BioMET NOW

Center for Biomedical Engineering and Technology - University of Maryland School of Medicine
in conjunction with the Fischell Department of Bioengineering, School of Engineering, University of Maryland, College Park

Getting Together

The University System of Maryland's Board of Regents has spent the last six months addressing the issue of merging two of the largest institutions in the system: University of Maryland Baltimore (UMB), now known as the Founding Campus, and University of Maryland College Park (UMCP). In the end, a merger was deemed unworkable but the development of a structure to facilitate increased formal and informal collaboration between these two formidable institutions was proposed, called the University of Maryland Strategic Alliance. BioMET could not be more thrilled! The resulting report was very similar to BioMET's own founding document and its mission as an organized research center (ORC) in the School of Medicine.

The original ORC Memorandum of Understanding (MOU) that is the basis for creating BioMET states: "The ORC's overarching goal is the integration of the medicine and engineering strengths of UMB and UMCP in order to produce world class programs that can be directly translated into high impact medical science applications and commercial products." This aligns nicely with the one of the goals of the Strategic Alliance: "Joint development of bioscience and biomedical academic and research programs on the two campuses, utilizing the expertise that exists at College Park in engineering, physics, and the biological sciences and the medical sciences and pharmacology in Baltimore." (p30) In addition, BioMET as an already established SOM center could easily become the model for "a center for medical innovation and technology, drawing upon both campuses' expertise in nanotechnology and biotechnology..." (p30) A link to the entire report can be found at http://www.usmd.edu/.

BioMET has always taken its mandate to bridge the two campuses seriously. Ongoing collaborations, originally highlighted in *BioMET Now* 14(1):2, are already significant. They include a Seed Grant between BioMET professor, Joseph Kao, and UMCP Department of Biology professor, Patrick Kanold, and joint publications. BioMET participated in the annual Fischell Festival in the Fischell Department of Bioengineering (*BioMET Now* 14(5):1) and is actively pursuing plans to have Fischell students do summer internships in Baltimore, a product of that participation. UMCP faculty have regularly presented their research at BioMET's annual retreat, and BioMET faculty have given at least one seminar at UMCP for the last 5 years. BioMET Acting Director Dr. W. Jonathan Lederer is also on the Science Advisory/ Formation Board for the Robert E. Fischell Institute of Biomedical Devices at

CONTINUED PAGE 3

BioMET
Scientific Programs

Laboratory of
Molecular Cardiology

Laboratory of
Nanobiology

Laboratory for
Neurodegenerative Diseases

Laboratory for
Prion Diseases

Program in
Cancer Biology

Program in
Cell Structure and
Development

Program in
Mitochondrial Dynamics

University of Maryland
School of Medicine

UNIVERSITY of MARYLAND

UMCP

THe UM Founding Campus report on the Strategic Alliance can be found at http://www.umaryland.edu/offices/communications/news/?ViewStatus=FullArticle&articleDetail=15375.

Congratulations to Dr. John Fisher upon his election as a Fellow of American Institute for Medical and Biological Engineering. Dr. Fisher spoke at the BioMET Retreat in 2010.

Prosser Has Banner Year

Dr. Benjamin Prosser, a post doctoral fellow in Dr. W. Jonathan Lederer's laboratory has had a remarkable 2011. Not only has he seen the licensing of his first patent and a paper in Science along with an editorial highlight, he also won the GPLS Outstanding Postdoctoral Fellow Award which he formally receive on November 7. Dr. Prosser was nominated by Dr. Lederer with support from SON Associate Professor Chris Ward and Dr. Prosser's PhD advisor, Dr. Martin Schneider. Dr. Ward filled in for Dr. Lederer at the ceremony as Dr. Lederer was in China for an international meeting.

Dr. Chris Ward, left and Dr. Ben Prosser, right.

Dr. Prosser also gave a Department of Physiology seminar on December 5, entitled "Stretch-dependent ROS and calcium signaling in heart." ROS stands for Reactive Oxygen Species. As published in Science, Drs. Prosser, Ward and Lederer have discovered a new signaling pathway in heart that involves ROS, an unexpected player in signaling pathways in the heart.

When a heart cell is stretched calcium signals are increased and this increase is directly related to ROS activity, according to Dr. Prosser. Heart cells stretch when the heart chamber is filled with blood during diastole. The link between the mechanical stretching of the heart and the signals that initiate contractions has long been sought after. By developing new technology, coupled with the Lederer's laboratory expertise in calcium imaging, the link is finally revealing its secrets.

The finding that ROS is involved in this link opens up a significant new area for therapeutic intervention. ROS are the target of anti-oxidants, well known in aging research. In hypertrophy of the heart (enlarged heart), the cells are unnaturally overstretched, but the link between this and arrhythmias was not clear. This research will open up a new area of experimentation aimed at elucidating the mechanisms involved in generating arrhythmias in the presence of hypertrophy. This is just one area that will be significantly impacted by these new findings.

Editor and Designer: Pamela B. Wright
Assistant Editor: Brian Hockenberry

Publisher: W. Jonathan Lederer, Acting Director BioMET
Assistant Publisher: Joseph Kao, Acting Associate Director BioMET

Contact us at: pbwright@umaryland.edu or 1-410-706-8181

BioMET
725 West Lombard Street, Rm 340
Baltimore, MD 21201 USA

Back issues of BioMET NOW are available on the web at: http://biomet.umaryland.edu

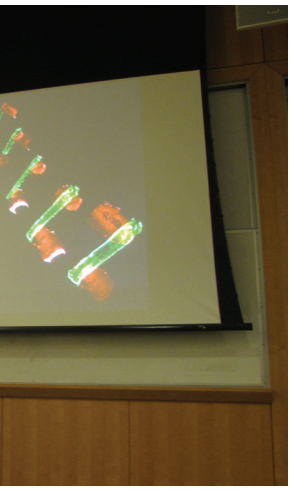
College Park. BioMET faculty are routinely included on thesis committees at UMCP.

In addition, BioMET from its earlier incarnation as the Medical Biotechnology Center (MBC) at the University of Maryland Biotechnology Institute (UMBI) has an entrenched collaborative ethic, a hallmark of UMBI's operation. Our faculty routinely pursue collaborators within USM, as well as nationally and internationally.

BioMET's history as a center of UMBI brings other advantages. Early on, before MBC had its own space, faculty were recruited through joint appointments at UMB (*Inside MBC* 4(6):3). These appointments were matched with faculty in the School of Medicine. This matching arrangement allowed MBC to acquire space for new faculty while supporting the departments donating the space and forged a lasting link to the School. Matching joint appointments (where one appointment is primary at one institution, while the other is primary at the sister institution) may be a useful model as the Alliance moves forward. It worked well to jump start the MBC.

The Strategic Alliance report also discusses many of the issues that arise from the distance between the two institutions. Former members of UMBI are very familiar with these issues, since UMBI's four centers were dispersed between Baltimore, College Park and Shady Grove. That experience should prove a useful resource as the Strategic Alliance is implemented. Four former UMBI center directors are at UMCP and Shady Grove (Drs. Edward Eisenstein, Donald Nuss, Greg Payne, and John Moult), as well as many former faculty members. Along with BioMET's Acting Director, W. Jonathan Lederer, their accumulated experience in developing a unified cooperativity while maintaining separate identities over considerable distances will be a valuable resource for both UMCP and UMB. Many of the goals and advantages in the report mirror those originally hoped for at UMBI. Thus, former members of UMBI will undoubtedly be the first to recognize the powerful impact possible as the Alliance goes forward.

The Strategic Alliance looks to be a wonderful opportunity to leverage the extensive expertise at two premier institutions, providing synergistic effects to further the missions of both institutions and the State of Maryland. BioMET's own mission within the School of Medicine will benefit significantly under the Strategic Alliance umbrella. As the Alliance moves forward, BioMET faculty and staff, along with their SOM colleagues, will no doubt have many opportunities to participate in this exciting venture.



Dr. Prosser beginning his seminar.

A Different Kind of Meeting

BioMET faculty regularly give seminars at other universities, are session speakers at scientific meetings, and even have given a keynote or two, but BioMET Assistant Professor, Mariusz Karbowski, is the first faculty member invited to talk at an advisory board meeting of a venture capital company, Dr. Karbowski was one of nine speakers to address the MPM Capital Medical and Scientific Advisory Board Meeting held on November 4 in Boston.

According to MPM's website, "MPM Capital is one of the world's largest life science-dedicated venture investors. With committed capital under management in excess of $2 billion, MPM Capital is uniquely structured to invest globally in healthcare innovation."

For this meeting, entitled "Mitochondria and Metabolism," the board wanted an overview of the state of mitochondrial research. Dr. Karbowski was the only participant from the University of Maryland School of Medicine. Of the other eight speakers, five were from Harvard, two were from MIT and one was from UC Davis. Other guests included researchers from Johnson and Johnson and Novartis.

Dr. Karbowski was very enthusiastic about the opportunity. "It was amazing," he said. "I have never had the opportunity to interact with this side of science before. It was a unique experience."

Given the emphasis on translating basic research discoveries into viable and profitable intellectual property, Dr. Karbowski's contacts may prove to be very useful in the future.

BioMET Happenings

Comings and Goings

Dr. Janet Ugolino left Dr. Monteiro's laboratory after graduating. She accepted a postdoctoral fellowship at the Johns Hopkins Bloomberg School of Public Health. Joseph Hunter Jr, a high school student, has joined Dr. Vogel's laboratory.

Publications

Liu L, Liu C, Zhong Y, Apostolou A, **Fang S**. ER stress response during the differentiation of H9 cells induced by retinoic acid. Biochem Biophys Res Commun. 2011 Dec 16. [Epub ahead of print]

Makarava N, Kovacs GG, Savtchenko R, Alexeeva I, Budka H, Rohwer RG, **Baskakov IV**. Genesis of Mammalian Prions: From Non-infectious Amyloid Fibrils to a Transmissible Prion Disease. PLoS Pathog. 2011 Dec;7(12):e1002419. Epub 2011 Dec 1.

Karbowski M, Neutzner A. Neurodegeneration as a consequence of failed mitochondrial maintenance. Acta Neuropathol. 2011 Dec 7. [Epub ahead of print]

Grants and Contracts

Dr. W. Jonathan Lederer, 12/1/11, NIH-NHLBI, "Stretch-Dependent Calcium Signaling in Heart," $337,500, yr 2 of 5.

Dr. Shengyun Fang, 12/1/11, NSF, "Regulation of the ER-associated degradation by importin beta," $225,114, yr 1 of 2.

Talks and Travels

Dr. Mariusz Karbowski, invited talk, "Regulation of mitochondrial outer membrane proteins by ubiquitination and proteasomal degradation," MBP Capital Medical and Scientific Board Meeting, "Mitochondria and Metabolism," Boston, MA, November 4, 2011.

Dr. W. Jonathan Lederer, Journal of Molecular and Cellular Cardiology editorial board meeting, Orlando, FL, November 15, 2011.

Dr. W. Jonathan Lederer, ENAFRA meeting, Orlando, FL, November 15, 2011.

Dr. Shengyun Fang, invited talk,"Protein quality control in the endoplasmic reticulum," College of Life Sciences, Jilin University, China. November 19, 2011

Noteworthy

Dr. Ilia Baskakov's paper entitled "Genesis of Mammalian Prions: From Non-infectious Amyloid Fibrils to a Transmissible Prion Disease," published online at *PLoS Pathogology* on December 7, is one of the 5 most downloaded papers for that period.

Annual Potluck

The holiday season is known for its culinary delights. That is certainly true when it comes to BioMET's annual potluck, held November 18th this year. There are some serious cooks among the staff and faculty as the heavily laden table attests. Dr. Lederer made his famous? spicy beans, to be served with a variety of hot sauces for the more adventurous. Dr. Karbowski brought his wife's specialty, green tea cake roll, rapidly becoming a must taste for newcomers and old hands alike. Anyone late to the table would have thought an army had attacked!