UN: What is the immediate goal of the research being conducted in your laboratory?

MR: In the Rolls lab we are currently focused on two major areas: understanding the basic cell biology of neurons and understanding cellular responses to neuron injury. In both of these general areas we concentrate on the role of microtubules.

Microtubules are one of the three major cytoskeletal systems in animal cells. They are particularly important in neurons because they form the tracks for long-range transport, and many neurons are extremely long cells. We think that one of the keys to understanding how individual neurons can function for the entire lifetime of an animal is understanding how the microtubule tracks are laid out to optimize transport within neurons. We have identified one mechanism that contributes to microtubule organization in dendrites, the receiving end of the cell. We also know that we do not yet have the full story, and that other mechanisms must exist as well.

In complementary studies we are investigating how microtubules are rearranged as neurons respond to injury, and how these rearrangements promote regeneration, degeneration and neuroprotection. We have identified several different types of axon injury that occur when axons are severed, and some of these were very surprising. One of the most robust responses to axon injury is a dramatic increase in microtubule number throughout the rest of the cell. Since this response happens every time an axon is injured we suspected it must be important, and we now think we are closing in on its role in a novel neuroprotective pathway.
UN: What are the possible larger implications/applications for the findings of your research?

MR: Our long-term goal is to use the basic knowledge of neuronal cell biology and neuronal responses to injury we acquire to improve outcomes in neurodegenerative disease and neuronal injury.

UN: Why did you choose to pursue a career in academic research and why in your particular field?

MR: Both of my parents are academic scientists, so I was familiar with what that entailed from an early age. When I visited my mother’s lab as a child we got hot chocolate from a machine, looked at pretty fish and puzzled over the modern art in the hallway. I also traveled to meetings with her in Australia, Italy, France… Towards the end of high school I realized I should base my career choice on something other than this set of data. I found a lab that would take a student just out of high school and had my first experience of being in a lab and doing research. I loved it! I spent most of the rest of my undergrad summers in this lab (Carolyn Machamer) at Hopkins and the school year in another lab (Jack Rose) at Yale. In both labs I was steeped in cell biology. This training has continued to be a strong influence.

As a cell biologist, neurons are just about the ultimate challenge. They can be a meter long, and have three distinct compartments: cell body, axon and dendrites. This spatial separation of functions initially drew me to neurons, but, of course they are also extremely important for our well-being, and this has kept me wanting to work on them. I am now particularly excited that our work is leading us to investigate cellular mechanisms of neuroprotection, degeneration and regeneration. I would love to be able to contribute to improving human health.

UN: What do you look for in selecting an undergraduate student to do research in your lab?

MR: I love working with undergraduate students in the lab if they are truly motivated about research. The drive to answer biological questions is the most important attribute of a successful research student. However, it is hard to assess this attribute before a first research experience! I look for students who are willing to make a long-term commitment to research and who understand that it is not something that can be squeezed into an hour or two here and there. Being articulate, enthusiastic and working well with people are also all helpful for lab success.

Check out new course offering (BMB 498B), where students will be participating in research being conducted by Dr. Rolls!

For more information, read Melissa’s most recent news article in the American Society of Cell Biology: http://www.ascb.org/files/1107memberprofiles.pdf
Dr. Brenchley Retires

Dr. Jean Brenchley enjoyed a career spanning research at several universities and the biotechnology industry and making contributions to understanding microbial regulation and diversity. In 1984, Penn State’s president recruited Brenchley to create a Biotechnology Institute and become the College of Science’s first woman department head. When Brenchley left administration in 1991, she pioneered a new research program discovering and examining cold-loving microbes which continues making press-worthy findings. Jean has served on numerous panels, committees, and editorships, and was elected president of the American Society for Microbiology. Among other honors are the Waksman Award for outstanding contributions in microbiology, the Tershak Teaching Award, the Alice Evans Award for service to women microbiologists, and the WISE Faculty Recognition Award. In addition to committee service, Jean taught nine different undergraduate and graduate courses in the department. She is grateful for the many enthusiastic and talented associates in her research program and a major reward has been watching the students and associates become independent scientists and professionals. Brenchley plans to continue research into microorganisms trapped within glacial ice cores during retirement.

Farewell Dr. Philip Mohr

Phil joined Penn State in 1976 as lecturer in the Department of Microbiology. He was promoted to affiliate assistant professor of Microbiology in 1982, to affiliate associate professor of Microbiology in 1990 and appointed director of BMB undergraduate programs that year. Mohr became affiliate professor of Microbiology in 1998. During his tenure of 35 years, he taught (in various years) Micrb 106, 201, 411 and BMMB 536 and 597A. He taught Micrb 412/422, Medical Microbiology/Lab, all 35 years. During his tenure, Mohr administratively oversaw many revisions to the BMB and Micrb curriculum. This includes the creation of the Biotechnology major. Phil served as adviser to the Clinical Laboratory Science program all 35 years. He also served as Microbiology Club/Student Chapter of ASM adviser for most of the 35 years. Mohr received the Tershak Memorial Teaching Award in 2000 and the ECoS Distinguished Service Award in 2003. Phil is looking forward to enjoying travel, pursuing several hobbies, reading some novels, and enjoying a leisurely second cup of coffee on cold, snowy Monday mornings.
DR. RITCHIE IS NEWEST BMB FACULTY MEMBER

The BMB department extends a warm welcome to Marylyn D. Ritchie. Ritchie joined the Department August 1, 2011. She is the director of the Center for Systems Genomics and an associate professor in Biochemistry and Molecular Biology. Originally from Pittsburgh, Ritchie received her bachelor’s degree at the University of Pittsburgh, Johnstown, and her Master’s and Ph.D. from Vanderbilt University in Nashville, Tennessee. The primary focus of her research is the detection of susceptibility genes for common diseases such as cancer, diabetes, hypertension, and cardiovascular disease, among others. The approaches will involve the development and application of new statistical methods with a focus on the detection of gene-gene interactions associated with human disease. Ritchie’s lab will explore pharmacogenomics. Statistical methods similar to those used for detecting gene-gene interactions in case-control data may be applied to pharmacogenomics data. Their research goal is to develop a collaborative research project with pharmacologists who are collecting this exciting data. Please stop by 512 Wartik and greet Dr. Ritchie and her lab members as they join our department’s investigative efforts.

ANJULI DATTA ASSUMES DUTIES AS UNDERGRADUATE PROGRAM ADVISER

As you have read earlier in the newsletter, Phil Mohr has retired after 35 years of valuable service to the students in BMB. He has advised many of you formally and informally during your time in the Department of Biochemistry and Molecular Biology. We wanted to make sure you are aware of a new undergraduate program adviser who has been appointed to assist you.

We are happy to announce the placement of Anjuli Datta as the new undergraduate program adviser. Some of you may already know her from being an instructor of PSU 016, Freshman Seminar or BMB 211, Elementary Biochemistry. She has now taken on added duties as the program adviser. Datta brings a wealth of enthusiasm to her new role and we know she will be happy to meet you.

She is available to assist you in 124 South Frear (Dr. Mohr’s old office). You can email her at aud17@psu.edu or call (814) 865-4825 to schedule an appointment.
CLINICAL LABORATORY SCIENCE (CLS)

is a critical health care field that impacts the health of every individual!

Now is the perfect time to pursue a career in clinical laboratory science. There are many job opportunities available offering good salaries and lots of room for advancement.

Do you enjoy hands-on laboratory work and are you a good problem solver? Can you find that needle in a haystack? Do you think finding out HOW and WHY something works is fun? If you are interested in the scientific HOW’s and WHY’s of health care, a career in laboratory science may be a perfect fit. Lab science people work in a lot of different areas including hospitals, clinics, and public health labs as well as industry, education and research.

If you find this interesting, meet with CLS adviser, Rebecca Falsone’s. You can email her at raf15@psu.edu to schedule an appointment.

ATTENTION JUNIOR CLS STUDENTS!

The annual meeting of junior CLS students who are eligible for recommendation to affiliated hospital schools of clinical laboratory science will be held on September 20th at 7:00 p.m. in 101 South Frear Laboratory. To be eligible for recommendation, students must have completed ALL Requirements of the CLS option of the Biotechnology major, with the exception of the clinical courses (Micro 405 A-F), by the end of the SP12 semester.

Information about the program, scheduling, grading, career opportunities and the recommendation process will be provided at that time. If you cannot make this meeting please contact Rebecca Falsone (raf15@psu.edu) in room 104 S. Frear.

COURSE MATTERS...

- Program change for BMB majors (BIOCH option and MCB option). The program will allow a maximum of 4.0- credits in 496.

- BMB/MICRB 496 applications for Spring 2012 will be available approximately 6 weeks in to the semester. BMB, MICRB and BIOTC students will notified via email. Applications will be due by the end of the 8th week of classes.
BMB OFFERS NEW LABORATORY COURSE

BMB 498B (Cell Biology Methods) is being developed as a new cell biology methods laboratory course for undergraduates in the BMB department. BMB 498B will serve as an alternative to BMB 445W in the Biochemistry and Molecular and Cell Biology options within the BMB major. The course will also count in the laboratory electives block for Microbiology majors. Students taking the course will learn techniques central to cell biology research that will be broadly useful in many types of science-based careers.

The first part of BMB 498B (taught by Carl Sillman) focuses on techniques for the isolation and analysis of eukaryotic cell organelles, analysis of chromatin structure, fluorescent imaging of eukaryotic cell structures and functions, and the use of yeasts as model organisms for genetic analysis, rDNA construction and expression, and the study of protein-protein interaction. In the second part (taught by Melissa Rolls) of the course, the students will put their new genetics and microscopy skills to work in a screen to identify genes that generate specific neuronal shapes in *Drosophila*. This part of the lab will introduce students to cutting-edge research, and will allow them to participate in generation of new scientific knowledge.

By working with the *Drosophila* system, students will be in effect participating in research being conducted by Melissa Rolls, whose laboratory is searching for genes that control dendrite branching patterns. In order for neurons to integrate information correctly, they need to have dendrites with specific branching patterns. Little is known about how these branching patterns are controlled, but alterations in dendrite shape are a hallmark of mental retardation. Using a simple genetic model system, students will test a panel of genes to identify new players in dendrite growth and branching. In this process they will learn how to perform RNAi in *Drosophila*, visualize neurons in whole living animals, and critically analyze a data set. At the end of the lab the students will present their conclusions to the class, and we will decide which genes in the set are most likely to contribute to dendrite shape and thus neuronal function.

BMB 498B is a two-credit course and is being offered during the fall semester.

SOUTH FREAR RENOVATIONS

There are multiple projects going on at the same time. Elevator upgrade, HVAC (exterior offices SF) and the entire renovation of the third floor of S. Frear. Demolition began a few weeks ago on the third floor and the HVAC project is off to a good start. Renovating an occupied building always provides multiple challenges on both sides in order for all the work to be accomplished without disrupting our normal operations.

The air handlers for the HVAC will be here this month and the deck penetrations have already been cut to accommodate the new air ducts for each floor.

The first floor of SF will be taken offline the summer of 2012. The hallways and the offices are the primary focus of the HVAC project. For those of us who have been here a while this is a welcomed improvement.
Honors and Awards

**FACULTY:**

**Melissa Rolls** - received 2011 Junior Recognition Award given by the Women in Cell Biology (WICB) committee of the American Society for Cell Biology (ASCB)

**Craig Cameron** - recipient of the Alumni Society’s Distinguished Service Awards. This award is presented annually to individuals who have made significant and outstanding leadership and service contributions. Dr. Cameron was presented with an award at the Eberly College of Science Alumni Society’s annual recognition reception (Oct. 2010).

**David Gilmour** - was selected as a recipient of the 2010 C.I. Noll Award for Excellence in Teaching. The selection is made by science students.

**Wendy Hanna-Rose** - was selected to receive the WISE Recognition Award in the Faculty Category. Her contributions to the advancement of women and girls in Science, Technology, Engineering, and Mathematics (STEM) fields have been well-documented in her nomination and we are honored to recognize Wendy for this outstanding work. (2011)

**Andrea Mastro** - recipient of 2010 Dean’s Climate and Diversity Award

**Marty Bollinger and Don Bryant** - newly appointed Fellow to the American Association for the Advancement of Science (2011)

**Richard Frisque** - recipient of Daniel R. Tershak Memorial Teaching Award (2011)

**Steve Keating** - recipient of Paul M. Althouse Outstanding Instructor Teaching Award (2011)

**Recent Promotions:**

**Song Tan** - Professor (7/2011)

**Andrey Krasilnikov and Dr. Yanming Wang** - Associate Professor (7/2011)

**STUDENT:**

**Awarded for Summer Research**

**Michelle Guignet** (BMB) Research adviser, Melissa Rolls Lab - Jacqueline Hemming Whitfield Student Research Endowment

**Kian Hui Yeoh** (BIOTC) Research adviser, Scott Selleck Lab - John Lapinski Summer Scholar Award & Paul and Mildred Berg Endowment for Eberly College of Science Summer Research

**Risha Khetarpai** (BMB) Research adviser, Lorraine Santy Lab - Edward B. Nelson Research Award

**Chyue Yie Chew** (BIOTC) - Research adviser, Donald Bryant Lab - Jacqueline Hemming Whitfield, Edward B. Nelson Paul and Mildred Berg, & the Charles & Vicki Grier

**2011 Undergraduate Exhibition**

**Benjamin Chambers** (MICRB) and **Hoon Chang** (BMB) won first place in the Health & Life Sciences Division.

**Christopher Natale** (BMB) recipient of the Undergraduate Discovery Summer Grant for his research "The Role of Type-1 S-Locus F-Box Protein in S-RNase-Based Self-Incompatibility in Petunia"

**BMB Department awards and Eberly College of Science designated department awards.**

**Joseph Basedow** - Facing Award

**Daniel Bloodgood** - Stiles Scholarship

**Benjamin Chambers** - Thompson (BMB) Scholarship

**Ryan Fine** - Davey Award

**Megan Fisher** - Miller Award

**Christin Folker** - Hutchings Scholarship

**Sarah Hill** - Anderson Memorial Scholarship

**Zachary Hostetler** - Venzie Scholarship

**Megan Hurray** - Ott-Lewman Scholarship

**Joyce Lee** - Morrow Award

**Diane Libert** - Morrow Award

**Jessica Meyer** - Gilmore Grant-in Aid

**Sarah Moore** - Herko Family Scholarship

**David Posocco** - Tershak Scholarship

**Angela Reiber** - Ott-Lewman Scholarship

**Emily Rutan** - Shigley Scholarship

**Chetan Safi** - Atlas Scholarship

**Timothy Wang** - Foster Scholarship

**Lin Yao** - Bright Scholarship

**Yevgeniy Yuzefpolskiy** - Gerth Award

**Tiffany Zak** - Maginnis Scholarship
This publication is available in alternative media on request.

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