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Alumni Profile | Michelle Avery, PhD



Program: Neuroscience
Year of Graduation: 2011

AS AN UNDERGRADUATE at Skidmore College, Michelle Avery, PhD, pursued a dichotomous double major in neuroscience and dance. Since then, she has found a career path in science communications that utilizes her creativity and her in-depth scientific knowledge.

"I have always been fascinated by the brain. I also learned while pursuing my degrees that I had strong presentation and communications skills," said Dr. Avery.

associate account executive at MacDougall Biomedical Communications in Wellesley, Mass., an agency that provides communication services such as investor relations, PR and crisis communications for biomedical corporations.

An Ohio native, Avery was initially drawn to the GSBS because of its high caliber researchers. "Looking back, I had really great mentors and I loved the collaborative spirit," she said. "Having the open lab spaces really contributed to the community atmosphere and I was never afraid to talk to others about my project."

As a neuroscience student, she researched axon degeneration in *Drosophila* in the lab of Marc R. Freeman, PhD, associate professor of neurobiology and a recently named HHMI Investigator.

Her thesis focused on discovering the mechanism of a protein that, when present, prevented axons from dying after they were severed.

Today, Avery finds herself in another collaborative environment—one that has

opened a new door for her. "Science is all about getting in there and getting your hands dirty doing the research," she said. "I am learning about types of science that I've never studied, which is fun. There's never a typical day and that's refreshing."

Avery has also become an informal mentor to GSBS students. Among her tips to those pursuing a science communications career is to begin blogging about science as a way to demonstrate knowledge as well as an ability to communicate it clearly.

"In today's market, having an ability to clearly communicate about science and its meaning may mean the difference between a company that thrives and one that fails," she said. ■

Anyone with news to share is encouraged to send their class notes to alumni@umassmed.edu. You may also submit notes by logging in to the Alumni Community website at <http://alumni.umassmed.edu> and clicking on "Class Notes" under the Alumni Network heading.

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Summer 2013

The Graduate School of Biomedical Sciences

Down syndrome breakthrough at UMMS garners worldwide coverage

When UMass Medical School announced on July 18 that researchers here had found a way to turn off the extra chromosome that causes Down syndrome, media outlets around the globe reported it. The study led by Jeanne Lawrence, PhD, and Jun Jiang, PhD, was first published in the online journal *Nature*. Although the research is yet to extend beyond the lab, the findings suggest great implications for Down syndrome research.

"This is the beginning of this idea and we're hoping more investigators get interested," Dr. Lawrence said. "This could have a lot of promise in other ways for Down syndrome and other disorders."

Lawrence and her research team are in the process of using this technology to see what results chromosome therapy will have on Down syndrome mouse models.

To see a list of the global coverage of this finding, visit bit.ly/197lx05. A related story about substantial funding for Lawrence's research into Down syndrome appears on page 2. ■



Marc R. Freeman, PhD, named Howard Hughes Medical Institute investigator

MARC R. FREEMAN, PhD, associate professor of neurobiology and a leader in the study of glial cells, was one of 27 Howard Hughes Medical Institute (HHMI) investigators named in May.

A member of the UMMS faculty since 2004, Dr. Freeman was a postdoctoral associate when he became interested in glial cells, the brain's most abundant and overlooked cell type. Working on a type of neural stem cell division that generated both neurons and glia, he realized how little was actually known about glial cells and saw a tremendous opportunity to explore new territory.

"At the time, there were all these new genetic, genomic and computational tools becoming available to study glia in *Drosophila*," said Freeman. "So about two years into my post doc I decided to switch from neurons to glia."

Although they comprise more than half

of all human brain cells, glial cells often take a backseat to their better known cousin, the neuron, among neurobiologists who thought these cells played only supporting roles in the central nervous system. That thinking has begun to change, thanks in part to the work done in the Freeman lab, where experiments have shown that glial cells are major players in the development, function and health of the nervous system.

Freeman came to UMMS with the intention of answering fundamental questions about glia biology, but his work had unforeseen implications for human diseases and health. His interest in the glial cell's response to injury led to the identification of a suicide mechanism in axons. When injured or severed, the axon activates a program that signals the glia to consume the injured axon.

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Supporting the Graduate School of Biomedical Sciences

Alumni support is essential to the GSBS student experience and leads directly to our graduates serving the citizens of the Commonwealth of Massachusetts and beyond through outstanding biomedical research. With less than 4 percent of UMass Medical School's budget coming from state funds, philanthropic contributions are vital.

Donations to the GSBS Annual Fund enhance the ability of the GSBS to provide a research training experience of national distinction by supporting advancements to research technology and educational equipment, and providing support for student professional development programs.

Every gift, no matter the size, makes an impact. Please consider joining your friends and fellow GSBS alumni by supporting the Alumni Annual Fund Campaign.

Gifts can be made online (w3.umassmed.edu/OnlineDonation) or by calling 508-856-5615. Contributions can also be mailed to the UMass Medical School Development Office, 333 South Street, Shrewsbury, MA 01545.

Merck Fund awards \$1 million for research into Down syndrome

JEANNE LAWRENCE, PhD, professor and interim chair of cell & developmental biology, became one of the inaugural recipients of three grants of \$1 million each in a new multi-year research program of the John Merck Fund to support translational research into developmental disabilities. The Translational Research Program supports scientists in developing treatments and improving outcomes for individuals with developmental disabilities, particularly Down syndrome and Fragile X syndrome (and FX-associated disorders).

"What's especially exciting about this program," said Marsha Mailick, PhD, chair of the fund's scientific advisory board, "is that it supports research with potential game-changing impact that is within the realm of probability—not just possibility—and could be achieved within 10 years."



UMass Worcester celebrates 40th graduation

The University of Massachusetts Worcester awarded 211 degrees, including two honorary degrees, at its 40th Commencement exercises on Sunday, June 2. Honorary degrees were presented to cardiologist James Dalen, MD, MPH, a founding UMass Worcester faculty member and champion of integrated medicine, and former MIT president Susan Hockfield, PhD, the first life-scientist to lead the prestigious institution. UMW awarded 117 doctor of medicine degrees; 32 doctor of philosophy degrees in the biomedical sciences; one master of science in clinical investigation degree; five MD/PhDs; and, in nursing, 49 master of science degrees, two post-masters certificates, one PhD and two doctor of nursing practice degrees. ■

Complete coverage of Commencement 2013 activities, including stories, slideshows and videos, can be found online at www.umassmed.edu/news/commencement/2013.

Dr. Lawrence's research project, "Accelerating Down Syndrome Progress by Translating Dosage Compensation to Trisomy," will pursue a unique approach to Down syndrome translational research based on the concept of functionally correcting the over-representation of Chromosome 21 genes by de-activating one of the three copies of Chromosome 21. "Where most people have two copies of Chromosome 21, those with Down syndrome (also known as trisomy 21) have all or part of a third copy of this chromosome," explained Lawrence. "Our lab has long worked on uncovering basic mechanisms whereby the expression of normal genes is controlled during development—the process known as epigenetics. The overall goal in this project is to translate recent developments in understanding these basic epigenetic mechanisms to a new research frontier in chromosome pathology that accelerates clinical translational progress in Down syndrome." ■

Other projects funded by the Merck Fund in this initial program include research by two investigators studying Fragile X syndrome. The awards were made through a competitive review process that began with 100 preliminary proposals and was narrowed down to 17 full proposals.

According to the announcement, the John Merck Fund has had a longstanding interest in people with intellectual and developmental disorders since its inception in 1970. In October 2011, the fund announced that it would spend all of its assets over the following 10 years to spur progress in four topic areas: treatment of developmental disabilities, clean energy, environmental health and development of a New England regional food system. The Translational Research Program is part of that ongoing commitment. The Boston-based foundation, established by the late Serena Merck and now in its third generation of family leadership, currently holds \$75 million in assets. ■



Albert Sherman Center opens

Gov. Deval Patrick headlined a host of elected officials and other dignitaries, including Albert "Albie" Sherman, to mark the official opening of the Albert Sherman Center on Wednesday, Jan. 30. An essential element of the governor's Life Sciences Initiative, the Sherman Center is an interdisciplinary, state-of-the-art research and education facility designed to maximize interaction and collaboration among researchers, educators and learners to encourage innovation and learning across disciplines.

For more information, visit www.umassmed.edu/shermancenter. ■

Mark R. Freeman...

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Freeman found that mutations in one gene in this pathway, however, resulted in severed axons surviving about 50 times as long after injury.

This and other findings have shed new light on the basic biology governing neurodegenerative diseases and how the nervous system responds to traumatic injury. Discoveries made in the Freeman lab are poised to provide critical insights that may lead to new treatments and therapeutics for a host of neurological conditions.

"When we started out I didn't have any intention of studying any diseases," said Freeman. "But as is often the case when you study fundamental processes in biology, you find connections that are very important for understanding and potentially treating human disease."

Freeman now plans to probe this axon degeneration pathway more deeply in the hopes of identifying ways to help neurons survive damage caused by traumatic injuries to the nerves or fend off the effects of neurodegenerative disease. ■

NEW CAREER DEVELOPMENT INITIATIVE LAUNCHED AT GSBS

CYNTHIA FUHRMANN, PhD, has been blazing a trail in her first year as assistant dean of career and professional development at the GSBS. This new position was created as part of an effort to establish career development training programs at UMass Medical School.

"I want to bring UMMS into the national spotlight for career development," said Dr. Fuhrmann, who joined the GSBS in 2012 from the University of California, San Francisco (UCSF). "I also want to empower students to make career decisions early in their training, so that by their third year they can take strategic, time-efficient actions to prepare for those careers."

Fuhrmann is well versed in this type of work. As a graduate student volunteer at UCSF, she created a highly successful career development program, called Preparing Future Faculty. After securing funding, she became the program director, a position she

held for more than six years. She was also a co-developer of myIDP, an online, interactive career planning tool targeted toward graduate students and post-doctoral researchers. GSBS students are now among 30,000 registered users who are working through personalized goal-setting and planning.

"Even mid-career scientists have told me that they find the tool helpful, that it's fun to go in, rate their own interests and skills, and compare them to potential career paths," Fuhrmann said.

Fuhrmann's overall approach to career development is rooted in a study she published in 2011 that examined career preferences of doctoral and postdoctoral scholars and how those preferences differ based on year of training.

"We found that students begin thinking about careers early in graduate training, but don't necessarily take action on career planning until just before they finish graduate

school," she said. "By that point, it's almost too late. They've run out of time to establish a network and get the practical experience they'll need to be competitive for those jobs." The study—the first of its kind—garnered national attention and was cited by the NIH in work groups and highlighted in several education publications.

A frequent conference speaker and faculty workshop presenter at academic institutions, Fuhrmann is integrating career development into the GSBS curriculum and will be piloting a career planning course and other program elements during the upcoming academic year. She also hopes to collaborate with any alumni who would be willing to talk to students about careers or to share their first application packages as anonymous learning materials. ■

Interested parties may contact Fuhrmann at 508-856-1935 or cynthia.fuhrmann@umassmed.edu.

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