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We Are … Bridging Medicine and Science, Vol. 1, Issue 4, Fall 2015

Marshall University Biomedical Sciences

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WE ARE...BRIDGING MEDICINE AND SCIENCE

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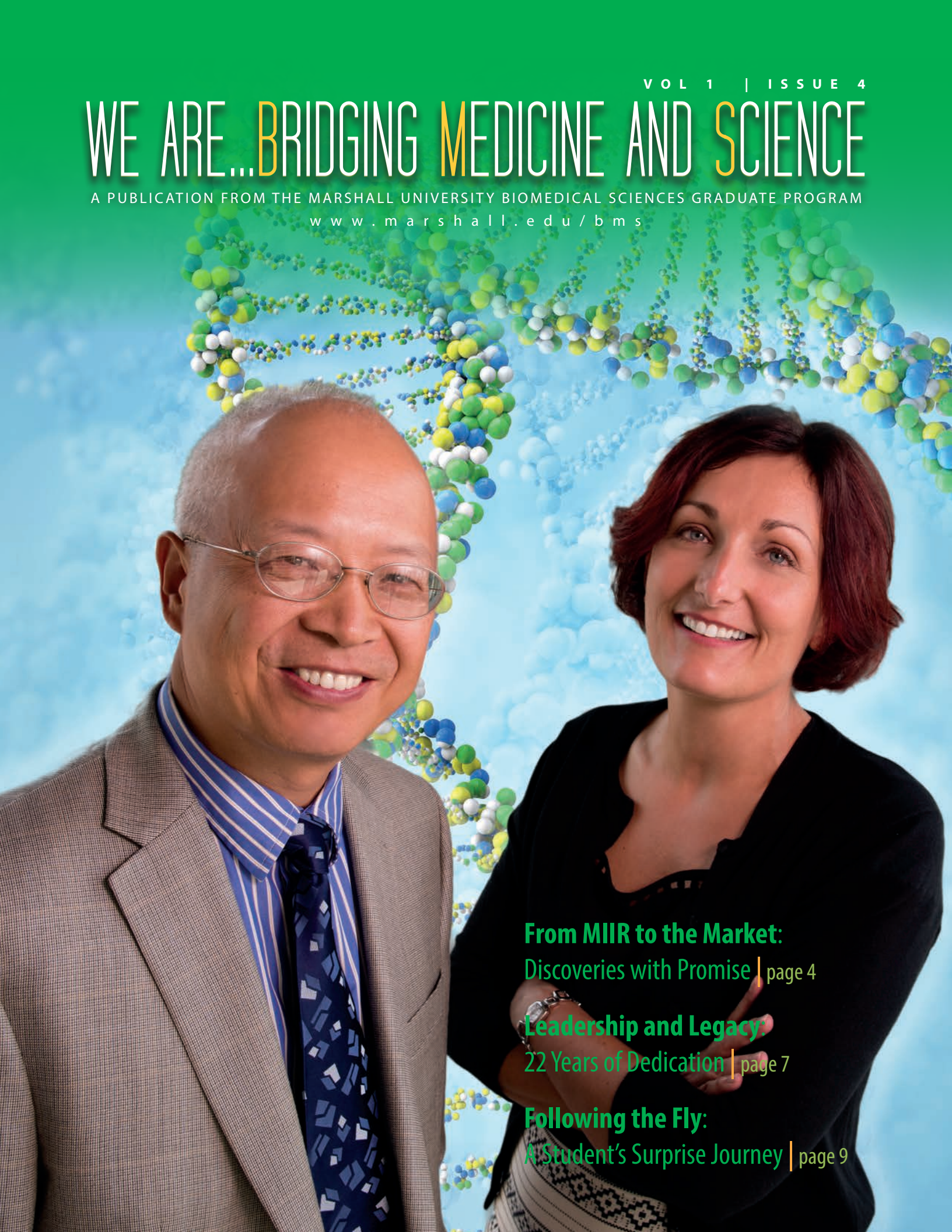

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VOL. 1 | NO. 4 FALL 2015

A publication of Marshall University Biomedical Sciences, providing news and information for and about faculty members, students, staff, alumni and friends.

Letters and suggestions are welcome at mubiomed@marshall.edu.

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BIOMEDICAL SCIENCES

Letter from the Vice Dean for Research and Graduate Education

In this issue of the magazine, "We Are...**B**ridging **M**edicine and **S**cience," I am pleased to share with you some important developments.

To better coordinate and promote all graduate education at Marshall University Joan C. Edwards School of Medicine (MUSOM), we recently reorganized the Office of Research and Graduate Education. First, Drs. Todd Green and Richard Egleton were appointed as Co-Directors of the Biomedical Sciences Graduate Program and are assisted by a dedicated staff including Anita Mathis, Diana Maue, Marie Murphy, and Kelly Carothers. The office is located in Suite 301 in the Robert C. Byrd Biotechnology Science Center. Along with the PhD, the MD/PhD, and the MS in Biomedical Sciences programs, the newly proposed MS in Clinical and Translational Science degree program will be housed in this office. Second, a group consisting of current students, recent graduates, and faculty are redesigning the PhD curriculum, both modifying existing courses and adding new ones. These changes will better prepare our students to be more competitive in research that has become more translational and interdisciplinary.

The students in our program have had a successful year. A few notable accomplishments are…

- Four of our PhD students received NASA fellowships: Deborah Amos, Caroline Hunter, Rachel Murphy, and Justin Tomblin.
- Holly Tamski and Chris Racine, both PhD candidates, received travel awards to attend the 2015 Experimental Biology Conference held in Boston, MA.
- Kristeena Wright, PhD Candidate, was among 19 young researchers nationwide selected to meet with members of Congress on Capitol Hill to promote scientific research.

Finally, distinguished new faculty members have joined the school and have brought with them new research opportunities for our students. These include Drs. Zijian Xie, Sandrine Pierre, Isabel Larre, Komal Sodhi and Subha Arthur. Our faculty's research excellence is reflected in papers published in top-tier journals and through several million dollars of peer-reviewed funding.

As you can see, positive changes have taken place recently at the School of Medicine to significantly improve the education and training of our graduate students. Please feel free to stop by the Office of Research and Graduate Education to further explore these exciting new developments.

Best regards,

Uma Sundaram, MD
Vice-Dean, Research and Graduate Education

From MIIR to the Market:
Discoveries with Promise

By Lisa Shrewsberry

Marshall Institute for Interdisciplinary Research (referred to as MIIR) is a traditional research lab with a sense of urgency, according to Director, Dr. Zijian Xie, and Education Coordinator, Dr. Sandrine Pierre. Since 2013, Xie has maintained the integrity of discovery while building a bridge from lab to consumer with promising new therapies for some of today's most challenging health issues. The research emerging from MIIR is both applicable and timely, relating to the most concerning diseases the world-over, including cancer, obesity, diabetes and metabolic disease. Graduating a compound from inception to viable product, however, is a costly prospect.

Getting a drug to market without an experienced pharmaceutical company partnership is nearly impossible, Xie explains. "In today's environment, it takes millions of dollars to move one compound to a Phase 3 clinical study." In fact, there are four phases preceding FDA approval of a marketable therapy. While discovering new compounds is a researcher's forte, executing large, expensive randomized trials and complex product launches is not. "That is for the experts — the pharmaceutical companies," Xie states.

MIIR recently filed a patent for a potential therapy for obesity and metabolic disease. Xie is cautiously optimistic. "This is very exciting but harvesting from this technology will be a long process," he states.

Researchers from MIIR and the Biomedical Sciences Graduate Program are also studying sodium-potassium ATPase and defining the protein's role in human physiology and disease development. "Understanding how (it) functions will give us the tool to hopefully develop new interventions for chronic disease," says Xie, who has studied sodium-potassium ATPase for more than 30 years.

The breadth and depth of Xie's and others' research, coupled with Marshall's determination to be a center of excellence in biomedical science, creates marketable momentum. "Marshall is a small institution compared to other universities. We realized we needed an incubator focused on research through discovery and through this to find inventions with commercial value. I was attracted to this position to continue basic research but at the same time to explore possibilities in marketing new therapies," Xie explains.

Like Xie, Dr. Sandrine Pierre came to Marshall because of the potential to advance ideas beyond the lab. "With the intellectual property we have here, we also have the ability to facilitate communication. To a classically trained academic scientist, marketing ideas can be intimidating. Now, I feel encouraged to partner with clinicians and companies with the structure we have in place here at MIIR," she says.

Additional innovation within the walls of MIIR includes cracking the codes of herbal medicine. Natural remedies with a track record, often centuries long, of relief for certain disease states are largely non-specific and inconsistent — hence, their lack of favor in western medicine. MIIR is studying these folk remedies in order to understand their mechanisms of action and to develop quality-controlled versions for more

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"We hope to create a new generation of remedies that can quickly translate into something marketable."

– Zijian Xie, PhD

From MIIR to the Market, continued from page 4

predictable, measurable results. "We hope to create a new generation of remedies that can quickly translate into something marketable," confirms Xie. He and colleagues are collaborating with scientists from all over the world to make this happen, including researchers from the University of Cincinnati, from Europe and from China. MIIR is a hub for cutting-edge research and technology to all of Marshall University. "Through the MIIR Seminar Series, we make sure graduate students and faculty have more exposure to research nationally and internationally," explains Pierre.

Aside from promising developments within the lab, Pierre is enthusiastic about MIIR's outreach within Marshall and the surrounding community. "We have a close relationship with the Biomedical Sciences Graduate Program. We are committed to offering opportunities to researchers at all levels," explains Pierre. As part of MIIR's commitment to retaining local talent, Pierre organizes tours of the facilities for undergraduates and high school students. Students come to MIIR labs for internships, rotations and mentored research as a part of completing their graduate degrees.

In a field that does more than its fair share of waiting for the next discovery, MIIR is advancing with a "now" mindset. "I really do believe that there will be important developments coming out of MIIR within the next few years," Xie reveals. "I realize with science and discoveries, uncertainties are high, but the goal is to turn our research into marketable therapies."

"In medicine, even if you are not a clinician, you want to help," adds Pierre. "If we as researchers want to see that happen, we have to reinvent ourselves."

She asks a final question to summarize MIIR's quest:

"Are we going to just continue to discover more or are we going to try and do something more with what we discover?"

Visit **www.marshall.edu/miir** for more information.

"Are we going to just continue to discover more or are we going to try and do something more with what we discover?"

– Sandrine Pierre, PhD

Leadership and Legacy: 22 Years of Dedication

By Lisa Shrewsberry

Serendipity — not a word expected in the research lexicon, but to Richard Niles, PhD, an undeniable aspect of life and science.

"A lot of research is very discouraging. Things don't work out, or results are not reproducible. Researchers need persistence and a strong backbone," he says, reflecting on his own longevity in the field. "80 percent of success in research is perseverance combined with some luck."

Serendipity may have brought Dr. Niles to West Virginia, but perseverance and innovation helped him advance the Biomedical Sciences (BMS) Graduate Program through to his retirement in August 2014, after 22 years of service to Marshall University. His actions took a department with promise and grew it into a formidable research presence, impacting the medical community regionally and beyond with discoveries changing the way professionals understand disease states like cancer.

Niles began his journey as the child of a determined single mother in Rhode Island. What foreshadowed his eventual career was an innate, insatiable curiosity.

"I can remember always being interested in science," he says. "I was intrigued by finding out how things worked."

Like many science-savvy students, he anticipated becoming a physician… until he met faculty member Dr. George Hartmann at Rhode Island College. "He taught a course in Mycology, the study of fungi. That is what got me hooked — formulating experiments and seeing results," recalls Niles.

Niles completed his undergraduate degree in Biology at Rhode Island College, his Master of Science in Botany from the University of New Hampshire, and his PhD in Plant Pathology/Biochemistry at the University of Massachusetts at Amherst, with a focus on

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"Dr. Niles was an amazing and compassionate leader whose shoes will never be adequately filled…"

— Diana Maue, BMS Graduate Recruitment and Communication Coordinator

Leadership and Legacy, continued from page 7

the molecular biology of crown gall, a plant tumor disease. Before joining Marshall University, he was Professor of Biochemistry at Boston University School of Medicine and spent more than 17 years delving further into cancer research with animal and human cells. Even then, he could not predict exactly where his passion would lead.

"I took the job as Chair of Biochemistry (at Marshall). I honestly never expected to stay 22 years." After trading bustling Boston for the pastoral backdrop of West Virginia, Niles thought he would ultimately continue on to a larger facility with greater research capability. Instead, he remained, becoming Senior Associate Dean for Research and Graduate Education, and subsequently Vice-Dean for Graduate Biomedical Sciences.

At Marshall, Niles' research evolved, exploring the influence of Vitamin A on cancer cells and its implication in preventative nutrition and the management of patient side effects. "Vitamin A causes cancer cells to differentiate into nonmalignant cells… this is very different from just killing them," he explains. His findings were published in the peer-reviewed journal *Genomics*. "This was only possible by Marshall having a genomics facility and because of Dr. Primerano's and the team's approach," Niles adds.

His influence on the work of Dr. Sarah Miles, a former post-doctoral fellow and now Assistant Research Professor, resulted in the development of an assay for a melanoma-type lesion of the eye. Today, the assay benefits patients around the world — including Belgium, Italy, and the United States.

Big things would emerge under Niles' administration. He came to Marshall with the intention to make the BMS Graduate Program sustainable and relevant beyond what might be expected from a smaller university and, as his colleagues attest, he accomplished this goal and more. His creation of the Biomedical Sciences, MS Medical Sciences Program has proven an undeniable advantage to prospective medical students in the crowded contest for admission. "I confess that I copied this program from

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Following the Fly:
A Student's Surprise Journey

By Megan Valentine, PhD

"Why on earth would anyone research flies?" One might wonder how Drosophila melanogaster, more commonly known as the fruit fly, has scientific utility. Although an annoyance outside of the lab, the fruit fly is an asset inside with its genetic similarity to humans. That is where my story begins.

In Fall 2009, I started the journey toward my PhD in Biomedical Sciences with an emphasis in Developmental Biology, working beside Dr. Simon Collier in a fruit fly lab at Marshall University. I used the fly to study the function of Chmp1 — a tumor suppressor gene in pancreatic and renal cancers.

Although excited by the prospects of researching at Marshall, I was handed a real blow in Spring 2013. My advisor, Dr. Collier, was taking a job at the University of Cambridge managing the Fly Facility in the Department of Genetics. That's right — THE University of Cambridge in the United Kingdom, a good 3900 miles away from Huntington. How could I possibly finish my PhD without an advisor? Thankfully, two University of Cambridge researchers and professors, Dr. Steven Russell and Dr. Cahir O'Kane, interceded. They invited me to visit the Department of Genetics at Cambridge and offered lab equipment and materials, as well as a working space for experiments and writing to complete my research.

At first, I was not seriously considering a journey abroad, but my family, friends, and Marshall professors were overwhelmingly supportive. So in July 2013, I packed my bags and moved my Drosophila-loving, introverted self to England, leaving behind my family, my precious pooch, and my bass guitar for a full six months.

Once in Cambridge, I resided with several roommates some distance from the Department of Genetics. I had no car, so I walked everywhere. My poor shoes clocked between four and 11 miles every day!

On my first day in the Department, I lunched at The Eagle, a quaint pub frequented by James Watson and Francis Crick — research rock stars! "They were here during their DNA structure-discovering days," I thought, thoroughly star-struck. I also attended a play about Rosalind Franklin's long-unacknowledged contribution to their discovery. It was such a neat experience walking down the same halls as so many renowned scientists.

I went from being the only research student working with flies at Marshall University to being a part of the Fly

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Facility at the University of Cambridge, with four temperature controlled incubation rooms and over 20 working stations — a resource used by about 20 research groups and over 100 students, post-docs, technicians, and professors every year. Shortly after arriving at the University, I tried my hand at the injection of fly embryos, the Fly Facility at the University of Cambridge being one of only a handful of centers in the world offering this resource.

While abroad, it was noteworthy to find that in some ways I had been spoiled by Marshall. Much of the work I did involved the imaging of fly tissues using microscopes. At Cambridge, my favorite specialized microscope, the confocal microscope, was a dinosaur compared to the multiphoton Leica confocal microscope in the Molecular and Biological Imaging Center at Marshall University.

My experience in Cambridge not only contributed to my personal growth, it also improved my research skills, especially my writing. Cambridge proved an ideal environment for the first scientific research paper I wrote entirely myself, now submitted to a highly regarded international developmental biology journal. I have also since graduated, my PhD complete.

I was happy to return to my Huntington home just before Christmas 2014. Although enlightening and unforgettable, the adventure in Cambridge was not always easy. I missed playing music with my awesome husband, Michael Valentine, and Brandon Branham in our bluegrass band, The Good Ol' Boys and a Girl.

Through Marshall University, I've been given the opportunity to work with brilliant students and professors, take classes on diverse topics and in hallowed classroom settings, and attend local, regional, and national conferences presenting my research. From each point along the journey, I can say that I've returned home having grown a great deal personally and professionally.

Dr. Meagan Valentine is presently an adjunct instructor for University of Rio Grande and Mountwest Community and Technical College. She also lectures for Marshall University Joan C. Edwards School of Medicine.

Meagan Valentine, PhD visiting the Eagle–the pub where the discovery that DNA carried genetic material was announced in 1953.

Careers of Recent PhD Alumni: Where Are They Now?

Johannes Fahrmann, PhD – Dr. Fahrmann earned his PhD in August of 2013 under the mentorship of Dr. W. Elaine Hardman. His dissertation title was "Omega-3 Fatty Acids as Therapeutic Options for the Treatment of B-cell Chronic Lymphocytic Leukemia." Dr. Fahrmann works for the #1 cancer hospital in the nation: MD Anderson Cancer Center. His research falls under the Red and Charline McCombs Institute for the Early Detection and Treatment of Cancer.

T. Ryan Withers, PhD – Dr. Withers earned his PhD in December of 2013 under the mentorship of Dr. Hongwei Yu. His dissertation title was "Genetic Regulation of Mucoidy in Pseudomonas aeruginosa." Dr. Withers works as Principal Research Scientist at Progenesis Technologies, LLC. His research focuses on engineering bacterial strains for the recombinant production of commercially-viable biopolymers.

M. Allison Wolf, PhD – Dr. Wolf earned her PhD in May of 2014 under the mentorship of Dr. Pier Paolo Claudio. Her dissertation title was "Benzyl Isothiocyanate as an Adjuvant Chemotherapy Option for Head and Neck Squamous Cell Carcinoma." Dr. Wolf relocated to South Carolina where she collaborates with Drs. Claudio, Eastham, and Koc. Dr. Wolf is an author on Dr. Emine Koc's recent publication on head and neck cancer. She plans to pursue a teaching career in the near future.

Meagan E. Valentine, PhD – Dr. Valentine earned her PhD in May of 2014 under the mentorship of Dr. Simon Collier. Her dissertation title was "Chmp1 negatively regulates Epidermal Growth Factor signaling in the Drosophila wing." Dr. Valentine teaches as an adjunct professor at University of Rio Grande and Mountwest Community and Technical College, and lectures portions of Elements of Medicine at Marshall University Joan C. Edwards School of Medicine.

Ben M. Owen, PhD – Dr. Owen earned his PhD in May of 2014 under the mentorship of Dr. Lawrence Grover. His dissertation title was "Short-term Activity-dependent Changes in Schaffer Collateral Axon Function." Dr. Owen works as a postdoctoral fellow at Morehouse School of Medicine. His research examines the mechanisms in excitatory post-synaptic potential-spike (E-S) plasticity in pyramidal and interneurons of the hippocampus.

Jacqueline Fannin, PhD – Dr. Fannin earned her PhD in May of 2014 under the mentorship of Dr. Eric Blough. Her dissertation title was "Cardiovascular Aging in the Female F344xBN Rat Model." Dr. Fannin resides in Cabell County, West Virginia where she focuses on her family.

Miranda B. Carper, PhD – Dr. Carper earned her PhD in December 2014 under the mentorship of Dr. Pier Paolo Claudio. Her dissertation title was "Identification and Characterization of Downstream Effector Protein(s) Regulated by p53 and pRb." Dr. Carper is a postdoctoral fellow at University of North Carolina at Chapel Hill. Her long-term goal is to transition into a career in industry.

Nandini D. P. K. Manne, PhD – Dr. Manne earned his PhD in August of 2014 under the mentorship of Dr. Eric Blough. His dissertation title was "Therapeutic Efficacy of Cerium Oxide Nanoparticles against Sepsis Induced Multi-organ Dysfunction Syndrome in Sprague Dawley Rats." Dr. Manne is a postdoctoral fellow at Marshall University. He also teaches Public Health Biology for Marshall's MPH program.

Sarah E. Daron-Mathis, PhD – Dr. Daron-Mathis earned her PhD in May of 2015 under the mentorship of Dr. Pier Paolo Claudio. Her dissertation title was "Cancer Stem Cells in the

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Screening of Anticancer Drugs for Central Nervous System Tumors." Dr. Daron-Mathis relocated to Tennessee where she seeks a postdoctoral position in the field of cancer biology.

Rounak P. Nande, PhD – Dr. Nande earned his PhD in May of 2015 under the mentorship of Dr. Pier Paolo Claudio. His dissertation title was "Investigation of Ultrasound Targeted Microbubbles as a Therapeutic Gene Delivery System for Prostate Cancer." Dr. Nande is currently seeking a postdoctoral position.

Annual Biomedical Sciences Retreat Keynote Speaker and BMS PhD Alumni

Sean Thatcher, PhD

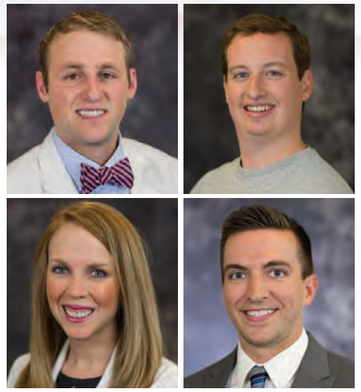
- Research Assistant Professor of Pharmacology and Nutritional Sciences
- Cardiovascular Research Center, University of Kentucky
- 2007 Graduate of Marshall's Biomedical Sciences PhD Program

"The Marshall Biomedical Graduate Program provided a strong foundation and an interdisciplinary approach to my graduate training in physiology. This program is vital to the development of not only great scientists but strong leaders within the community who can help battle the region's toughest chronic diseases, such as obesity and cardiovascular disease."

Medical Sciences Students for President!

By Lisa Shrewsberry

With election rhetoric in the air, the public is reminded of the importance of being discerning, especially where potentially life-impacting decisions are concerned. The proof of the pudding is, as the old adage goes, in the eating, or in the case of the Biomedical Sciences MS, Medical Sciences Program, it's in the *leading*. For the last four years, a former student of the program's Medical Sciences area of emphasis has held the highest elected leadership position at the Joan C. Edwards School of Medicine (MUJCESOM) — class president. Coincidence? One in-the-know program graduate says "no way!"



Top Row: Matt Snyder, Class of 2016; Brad Gillon, Class of 2018 *Bottom Row:* Michelle Studeny, Class of 2017; Aaron Dom, Class of 2015

Current president of the MUJCESOM Class of 2016 Matt Snyder received his MS in Biomedical Sciences with an emphasis in Medical Sciences in 2012. He began medical school the following fall. Snyder credits the program for his unwavering success as a medical student.

"I could not have imagined starting medical school without the knowledge and experience the program provided me. The greatest advantage is the immersion into a true medical school curriculum alongside medical students," Snyder states.

Other BMS students/alumni who attained the position of class president are Brad Gillon, Class of 2018, Michelle Studeny, Class of 2017, and Aaron Dom, MD, Class of 2015.

"If it weren't for my experience in the BMS program, I would not have felt as prepared or comfortable at the beginning of medical school and I would not have had the experiences to be a helpful leader for my peers," states Studeny, who put her leadership skills on display during her tenure as president.

Class of 2015 president Aaron Dom, MD, expresses gratitude for the BMS program. "The BMS program aided me greatly in preparation for medical school. It gave me not only a solid knowledge base from which to begin my medical career, but also a confidence that allowed me to pursue other endeavors, like leadership positions," he says.

To Snyder and all of his high-achieving peers, their success after choosing the BMS program is proof positive that the path works.

Class of 2018 president, Brad Gillon, agrees. "The Master's in Biomedical Sciences (Medical Sciences Area of Emphasis) at Marshall University is without a doubt one of the premier Master's in Medical Sciences programs in the country. To all medical school prospects, I strongly urge you to consider the Marshall program as a means to make your goal a reality," he says.

Grad Student Stereotypes: True or False?

By Lisa Shrewsberry

1. They're obsessive readers.

Verdict: TRUE

Lexie Keding began her journey as a Biomedical Sciences PhD student at Marshall University in July 2015. She admits she always has her nose in an abstract of some kind.

2. They're boring.

Verdict: FALSE

Keding defies this sterotype with a résumé of adventure built before pursuing a career in research.

Originally from Wheeling, WV, she was a professional horse trainer who took her GED exam at the age of 16 to follow her equestrian interests across the country.

Clockwise from Top: Lexie Keding, Sean Piwarski, Roy Al Ahmar

3. They've had their dissertations planned… since elementary school.

Verdict: FALSE

While Keding knew exactly what her research focus would be upon taking the PhD pathway, that isn't always the case. "The program is designed to support students who haven't yet narrowed their interests," she states.

4. Their lives are on indefinite hold.

Verdict: FALSE

Roy Al Ahmar, a PhD student in Infectious and Immunological diseases, chose Marshall as a Fulbright scholar.

"Initially, I thought 'four years, then two years of graduate school, and another five to eight years toward a doctorate —.' It sounds like you will be in the classroom until you are 30. After your first year, your job is the same job you'll be doing whether you are at a university as a student or as an employee. You are a researcher working toward a degree," he states.

As for life outside of the lab, he said, "If I manage my time right, there are plenty of hours left. I work out, hike with my girlfriend and play intramural games."

5. They are overly idealistic.

Verdict: TRUE, but…

Sean Piwarski, a Biomedical Sciences PhD candidate, is studying environmental toxicology, as it relates specifically to breast cancer. Piwarski's high aim is deeply rooted in personal experience.

"My first year of the Biomedical Sciences program, my mom was diagnosed with cancer," Piwarski said. It was a tough time for the Adelanto, California native who became even more committed to his research, with the hope of one day improving the effectiveness of chemotherapy.

"I am an athlete. I played football through high school and college. I am used to being a stubborn leader — I do not like to lose," he states.

Piwarski believes his greatest lessons at Marshall have come through his failures, no matter how hard it has been to take criticism.

"I have learned it is okay to have ideals, but you also must understand how to go about conducting research."

Leadership and Legacy, continued from page 8

the very successful medical sciences program at my former institution, Boston University School of Medicine. The last time I checked the statistics, for those students who spent at least one year in Marshall's program, there was an 80% success rate in gaining admission to a medical or other health-related professional school."

Dr. Niles made enduring decisions to ensure growth beyond his retirement by attracting as much talent as possible to Huntington. He revitalized the MD/PhD program to include financial incentives such as scholarships and a stipend, making the dual degree option more appealing. Also, he conceptualized "We Are…**B**ridging **M**edicine and **S**cience" magazine as an outreach tool for attracting applicants and conveying information about the Biomedical Sciences Graduate Program to Marshall University personnel and other supporters.

Despite these and many other achievements, he considers his most significant contribution to be a diversifying one. "I helped establish the Summer Research Internship for Minority Students (SRIMS) program. It has blossomed from applicants asking, 'Where is Marshall?' to getting applications from all over the country, including Hawaii, Puerto Rico, and the Virgin Islands."

Niles still plans to seek the answers to compelling questions. Having wrapped up his immediate need for a little R&R, he will continue as a consultant within his field.

Considering his professional legacy, he says, "I would like to be remembered as a person who was fair, who cared for my students and my colleagues as people, and not just about their research."

▲ Dr. Niles pleased to receive a unique Marshall hanging at one of his retirement gatherings.

Colleagues have established an endowment in Niles' name to honor his contributions to the Marshall University Biomedical Sciences Graduate Program and to the Joan C. Edwards School of Medicine.

The funds will support future research and the training of graduate students at Marshall University. Those interested in contributing to the endowment may contact Linda Holmes at 304-691-1711 or holmes@marshall.edu.

Dr. Niles' dedication to cancer research, to students, and to fellow colleagues has earned a steady stream of unsolicited accolades inside and outside the Marshall University campus. Among others, his honors include:

- Researcher of the Year, MU Sigma Xi Chapter
- Alumni Achievement Award, Rhode Island College
- Marshall University's Distinguished Artists and Scholars Award
- International Sebetia-Ter Award in Biomedical Sciences, Naples, Italy
- Graduate Faculty Achievement Award, BMS Graduate Program

"I always found Dick to be a gentleman, fair with everyone and concerned about the futures of our faculty and students. He is a wonderful colleague and friend and a true asset to Marshall University. Even in retirement, he continues to contribute to the medical school."

— Gary Rankin, PhD

▼ A cake specially tailored to Dr. Niles' interests in and outside the lab!

Announcing a New Degree – **Clinical and Translational Science, MS**

Marshall University Joan C. Edwards School of Medicine's Clinical and Translational Science (CTS) Department has proposed a Master of Science (MS) degree in Clinical and Translational Science to begin in fall 2016.

The goal of this program is to equip physicians-in-training and other biomedical scientists with the information and training necessary to translate basic clinical advances into improved patient care that will enhance the quality of life for patients in the Appalachian region, particularly southern West Virginia.

COURSEWORK FOCUS: As a CTS MS student, you will receive graduate education in clinical trial design, epidemiology, statistics, informatics, and translational research.

Application Deadline: March 1

EMPLOYMENT OPPORTUNITIES: Graduates of this program will be able to lead clinical trials of new drugs and procedures in West Virginia, particularly in its rural regions. CTS graduates also will be strong candidates for positions in schools of medicine and medical centers that have Clinical and Translational Science Centers.

ENTRY TERM: Fall only

PREREQUISITE COURSEWORK: One year of biology, chemistry, organic chemistry, and physics with associated laboratories. Cell biology and biochemistry are highly recommended.

MINIMUM REQUIREMENTS: Bachelor's degree from an accredited institution and a 3.0 GPA

REQUIRED APPLICATION MATERIALS: Application with fee, official transcript(s), three letters of recommendation, and written statement. No entrance exam is required at this time.

WHO SHOULD APPLY?

- Undergraduates in their senior year
- Medical students at an LCME-accredited U.S. medical school with a current GPA of at least a 3.0
- Postgraduate medical residents or fellows who have an MD or DO with a graduating GPA of 3.0 or better (equivalent GPA for foreign medical graduates)
- PhDs in biomedical sciences or PharmDs with graduating GPAs of 3.0 or better.

Note: Medical students will apply to the program during their third year of training. After completing the requirements for the MS degree, students will finish the fourth year of medical school. Medical residents and fellows admitted into this program will need to integrate coursework into a reduced clinical workload, thus extending their postgraduate medical education by two years.

DURATION OF THE PROGRAM: Students will attend full-time and complete the requirements for the MS degree in two years. This includes attending during the summer between years one and two.

For more information, visit http://jcesom.marshall.edu/ctsms or contact the Office of Research and Graduate Education at ctsms@marshall.edu or 304-696-3365.

Scholarship in the Amount of Tuition and Fees Available*

SUMMER RESEARCH

Make it Happen

www.marshall.edu/bms/srims
www.marshall.edu/bms/aha
www.wv-inbre.net

Personnel Update

The following faculty and staff are serving in new positions related to Marshall University School of Medicine's Biomedical Sciences Graduate Program.

Uma Sundaram, MD
Vice Dean of Research and Graduate Education

Richard Egleton, PhD
Co-Director, Biomedical Sciences Graduate Program

Todd Green, PhD
Co-Director, Biomedical Sciences Graduate Program

Zijian Xie, PhD
Director and Investigator, MIIR

Sandrine Pierre, PhD
Associate Investigator and Education Coordinator, MIIR

Jiang Liu, MD, PhD
Associate Investigator, Department of Pharmacology, Physiology and Toxicology

M. Isabel Larre, PhD
Assistant Investigator in Residence, MIIR

Swanthana Rekulapally, MS
Next Generation Sequencing Analyst, Genomics Core Facility

Jinsong Hao, PhD
Adjunct Assistant Investigator, MIIR

Andy Grass, PhD joined the Department of Anatomy and Pathology as Instructor in June 2015.

The following faculty and staff have recently retired from or left their positions related to the Biomedical Sciences Graduate Program.

Mitchell L. Berk, PhD
Professor
Department of Anatomy and Pathology – 30 years of service

Susan Jackman, PhD
Department of Biochemistry
24 years of service

Jenny Nelson
Administrative Assistant, Sr
Department of Pharmacology, Physiology, and Toxicology – 34 years of service

Darlene Cordle retired from the Department of Pharmacology, Physiology, and Toxicology as Program Assistant II.

Richard M. Niles, PhD retired after dedicating 22 years to Marshall's J.C.E. School of Medicine, with one of his longest roles being Vice Dean of Research and Graduate Education, Biomedical Sciences.

Marc Spencer, PhD left the Department of Anatomy and Pathology as an instructor in June 2015.

John Wilkinson, IV, PhD retired from the Department of Anatomy and Pathology in June 2015.

RECOGNIZING EXCELLENCE

Each year Biomedical Sciences Graduate Program faculty, staff, and research students gather to share their research, enjoy a speech by an alumni guest, and present awards for research and service.


Deborah Amos


Caroline Hunter


Justin Tomblin


Holly Racine and Chris Racine with baby girl


Kristeena Wright


Sean Piwarski

The students in our program have had a successful year. Some notable accomplishments include:

Four of our PhD students received NASA fellowships: Deborah Amos, Caroline Hunter, Rachel Murphy, and Justin Tomblin.

Holly Racine and **Chris Racine**, both PhD Candidates, received travel awards to attend the 2015 Experimental Biology Conference held in Boston, MA.

Kristeena Wright, PhD Candidate, was selected as one of only 19 young researchers nationwide to meet with members of Congress on Capitol Hill to promote scientific research.

Sean Piwarski, PhD Candidate, received the Chancellor's Scholarship for underrepresented minority students in the Biomedical Sciences PhD Program.

Awards are presented annually at the Biomedical Sciences Research Retreat, and for the 2014-2015 year…

Amanda Krauss (4.0 GPA) received the Goran Boskovic Best Academic Performance for a First Year BMS MS Medical Sciences Student.

Roy Al Ahmar, PhD Student, was awarded the Goran Boskovic Best Academic Performance for a First Year BMS Research Student.

Chris Racine, PhD Candidate, received the Best Research Performance award and will receive funds to present his research at a national conference.

Kristeena Wright, PhD Candidate, was awarded Best Overall Performance as a Graduate Student and will receive funds to attend an international research conference.

Taha Ahmad, PhD Candidate, and **Preeya Shah, MS** (BMS MS Medical Sciences Graduate), each received a $500 scholarship awarded by the Graduate Student Organization (GSO).

Richard Egleton, PhD – Co-Director of the BMS Graduate Program – received the award for Best Faculty, and **Kelly Carothers** – SRIMS Coordinator and Assistant Graduate Recruiter – received the award for Best Staff Member. Both of these awards were selected and awarded by the GSO.


Amanda Krauss


Roy Al Ahmar


Taha Ahmad


Preeya Shah


Richard Egleton, PhD


Kelly Carothers

Welcome to the Biomedical Sciences Family!

PhD Students – Joined in Summer 2015 – In photo above from left to right

Jamie Friedman – Bethany College
Lexie C. Keding – West Liberty University
Becca Martin – Davis and Elkins College
Jackie Parkman – Washington State University
Sarah Stevens – Cedarville University

Research MS Students – Joined in Fall 2015

Morghan Getty – University of North Carolina, Wilmington
Minqi Huang – Wuhan University

MS Medical Sciences Students – Joined in Fall 2015

David Bartlett – Marshall University
Monty Chowdhury – The Ohio State University
Pat Gue – West Virginia Wesleyan College
Asad Khawaja – The Ohio State University
Ben Miller – Davis and Elkins College
Dustin Miller – West Virginia Wesleyan College
Jamila Ranavaya – Marshall University
Emily Rider – University of Charleston
Dylan Saunders – University of Charleston
Scott Thiesfeldt – University of Wisconsin, Platteville
Tammie Tran – University of California, Riverside
Sam Wood – College of Charleston

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Biomedical Research: Of Clinical Significance

Marshall University Joan C. Edwards School of Medicine's Biomedical Sciences (BMS) research focuses on health concerns of clinical significance on a global scale, with particular attention given to the Appalachian region. The following highlights Marshall's current research projects designed to address some of these disparities and their risk factors.

Problem: According to the American Health Rankings (www.americashealthrankings.org), West Virginia leads the nation in obesity, heart disease, smoking, drug deaths, diabetes, premature death, cardiovascular death, cancer death, and, from an environmental standpoint, pollution.

What Marshall's researchers and BMS PhD students are doing about it:

Cardiovascular Disease, Obesity, Diabetes, and Cancer Studies

- The role of adipose (fat) tissue and inflammation in the development of cardiovascular disease
- Sodium/Potassium ATPase signaling in regulating hypertension
- The genetics of diabetes
- The role of mitochondria in both energy and reactive oxygen species production

Environmental and Toxicology Studies

- The role of the liver and kidneys in the detoxification and activation of toxic compounds
- Temperature-based bone growth therapies
- Genetic differences in drug metabolizing enzymes
- Neonatal abstinence syndrome (NAS, neonate drug withdrawal)
- Nicotine-regulated blood vessel growth and increased angiogenesis in disease
- Environmental links between obesity and cancer

Other Studies include

- The role of nutrient transporters in regulating irritable bowel disease
- Preventing pathogenic microflora in cystic fibrosis patients
- Synaptic plasticity and mechanism of action of antidepressant drugs

Our primary goal through biomedical sciences is to use a translational research approach (i.e. the use of laboratory research to improve clinical treatments) to help reduce the numerous health disparities of the Appalachian patient population and to improve health outcomes for our region.

For more information, visit www.marshall.edu/bms, or contact the Office of Research and Graduate Education at mubiomed@marshall.edu or 304-696-3365.

PhD Application Deadline is January 15.
Scholarships are available for Research MS students.*

www.marshall.edu/bms