



DEAN'S MESSAGE: What's On My Mind

What's on my mind this month are the many innovations in education we have implemented at the School of Medicine over the last year, fulfilling one of the key goals of Shared Vision 2020, to introduce a new teaching philosophy focused on training the next generation of innovators and discoverers.

Over several issues of SOMnews, we have discussed the progress of the new Foundations of Research and Critical Thinking (FRCT)

course, and have shared the thoughts of the faculty leaders who brought this course into fruition. This revolutionary approach to implementing a culture of inquisitiveness and analytical thinking skills in our medical students, as well as impressing upon them the integral role that biomedical research plays in transforming medical practice, has caught the attention of the national media. This course has been

mentioned in *US News & World Report*, as well as in the academic medical community, with our FRCT course being featured in recent issues of *The Chronicle of Higher Education* and the *AAMC Reporter*. However, we must never lose sight of how this course has and will impact our students and their perception of what research means to their chosen career path. Therefore, I am very pleased that in this issue of the newsletter, we include an article that shares medical students' perspectives of the new required course.

Not only do we want to impress upon all our students the importance of research from the perspective of the healthcare practitioner or scientific researcher, but we also want them to realize the impact that research has on them as patients. Last year, we highlighted a summer elective course for our second-year medical students, called the "Personal Genomes in Medicine." Co-directed by Alan Shuldiner, MD, and Miriam Blitzer, PhD, the course gives students a glimpse into the world of personalized medicine, and a greater understanding of how a patient's genetic information could be used to tailor treatment and therapies. Students who chose to take this elective received an opportunity to genotype their own blood to search for genetic markers that could predict their response to certain medications, as well as markers that could predict potential side effects to medications.

The success of the course, and the powerful effect that analyzing one's own genes can have on a developing physician, led us to expand this opportunity to all incoming medical students. This fall, our second-year medical students will have a chance to examine their own genetic data to determine which drugs they might be predicted to respond to and which drugs they might want to avoid, based on their examination of a select group of genetic markers.

Our graduate students continue to conduct outstanding research, presenting at national conferences, publishing in high-impact journals, and successfully competing for federal research funding. The School of Medicine programs equip our students with the skills necessary to launch their careers as independent investigators. However, the most successful scientists today are not only the most inquisitive and adept in the laboratory, but also those who can convey their work and their enthusiasm for science to multiple audiences. In this age of social media, online publishing, YouTube,

and other mass communication outlets, scientists must be able to discuss their research articulately for their peers, grant reviewers, and, potentially, the evening national news. Effective communications skills must be practiced and refined, which is why I am pleased that the School of Medicine's Office of Public Affairs and Communications will kick off its second Science Communications Internship for graduate students and postdoctoral fellows this month.

As I considered the question of who exactly are

the "next generation of innovators and discoverers," my answer comprises many different groups of individuals. Our current medical, allied health and graduate students represent one group. Indeed, these individuals have chosen to pursue careers in medicine and biomedical research, contributing in a variety of methods to a greater understanding of human health and disease, thereby improving the well-being of all people. However,

a passion to pursue medicine often begins long before medical or graduate school, and even before college. With the increased emphasis in science, technology, engineering and mathematics (STEM) education, young minds are being encouraged to seek answers to some of the most vexing problems in health today.

For example, the Society for Science & the Public has held a Science Talent Search for high school students for over seventy years. Sponsored by the Intel Company since 1998, this competition recognizes exceptional high school senior research projects. The 2014 winner, a 17-year-old from California, used a multidisciplinary approach to identify a potential new class of drugs against the influenza virus. Other finalists in this year's competition developed projects that may provide insights into arrhythmias, predict the spread of breast cancer, and determine the effects of exposure to electronics on adolescent sleep, learning and stress.

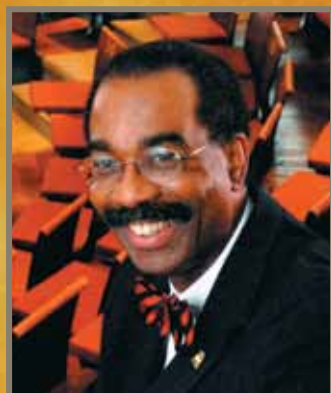
These young minds are truly incredible, and their bold, perhaps brash, approaches to solving complex biomedical questions are desperately needed in research today. In our most recent update on the Accelerating Innovation and Discovery in Medicine (ACCEL-Med) initiative, I briefly mentioned the School of Medicine's new "Young Brain Initiative (YBI)." My goal for this program is to encourage the type of innovative, "outside the box" thinking which led a young physician and a medical student to discover insulin. The YBI will not only encourage our students to pursue major research questions, but senior faculty and staff will help guide the most promising student projects, and those students will receive recognition for their incredible efforts at future graduation award ceremonies.

As we head into the summer months, we reflect on the many new directions our educational initiatives will take our current and incoming students and how these steps move us ever closer to fulfilling our Vision 2020.

In the relentless pursuit of excellence, I am

Sincerely yours,

E. Albert Reece, MD, PhD, MBA
Vice President for Medical Affairs, University of Maryland
John Z. and Akiko K. Bowers Distinguished Professor and
Dean, University of Maryland School of Medicine



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Bridging the Gap Between Clinical and Laboratory Science



The Graduate Program in Life Sciences (GPILS) is now offering a special five-credit, 17-week Translational MS Core course designed to provide a comprehensive overview of current knowledge in cellular, molecular, and structural biology and form the backbone for subsequent specialized studies in translational research.

“One of the key audiences is Master’s students who come into GPILS who are definitively using the Master’s as a bridge between undergraduate and medical school,” says course director Kara Scheibner, PhD, who is also an Assistant Professor in the Department of Pediatrics. “We have some people who do that.”

However, this is not the only audience. The course has been designed with several other types of students in mind, including Master’s students who are also working; Master’s students whose goal is to work in translational research; postdoctoral fellows who are working in cellular and molecular biology, but have not trained extensively in these areas; clinical fellows who are transitioning into research; and professionals (nurses, etc.) who are involved in clinical research and want to gain a more comprehensive cellular and molecular background.

The course is a mixed-format class, with both online and classroom elements. “The main Core course that all PhD students take is 6–8 hours

a day, but not all students can put that kind of time commitment in,” says Dr. Scheibner. “So what we have them do in this class is listen to 4–5 hours of lectures a week, the same lectures that are being given in the main Core course (the lectures are recorded and posted on iTunes University for students to access). They can go online and get the Power Points that go with the lectures, and as the Power Points are playing they have audio.” Blackboard discussion boards allow for class discussions after each lecture.

Once a week, students are also required to attend class in person, but the classes are held in the late afternoon for those who might be working or attending other courses earlier in the day. Here students get the chance to interact more fully with the faculty members whose lectures they accessed online, and also present their projects.

Although the content is the same as what is taught in the main Core course, not all of it is included for this course. “For a translational student, they need the basics of cellular and molecular biology and genetics and those things, but they don’t need some of these other things, like x-ray crystallography, that are just over and beyond [what non-PhD students need to know],” explains Dr. Scheibner.

The next session of the class starts in August. Students and clinical fellows on campus who are interested in participating can email Dr. Scheibner at kscheibner@som.umaryland.edu for registration information.

Translating Genomic Discoveries Into Clinical Practice

DESPITE REMARKABLE ADVANCES in genomic medicine, translation into clinical practice has been slow. There are multiple barriers to implementation of genomics advances into health care. To identify and overcome these barriers, in 2011 the University of Maryland established the Program for Personalized and Genomic Medicine (PPGM). Supported by institutional funds from the University of Maryland School of Medicine (UMSOM) and University of Maryland Medical Center (UMMC), the mission of PPGM is to advance discovery in genomics and other “omic” sciences; to accelerate translational research and implementation of these discoveries into more effective and safe individualized health care; and to enhance the training and education of current and future generations of health care providers and scientists through a personalized and genomic medicine-driven curriculum.

In order to promote research in and the early adoption of evidence-based personalized and genomic medicine into clinical practice, PPGM has orchestrated a multi-faceted education and outreach program for medical and graduate students, residents, clinical and research post-doctoral fellows, and faculty. These education programs actively solicit engagement and utilization of PPGM resources and infrastructure.

PPGM co-sponsors Grand Rounds in clinical departments and research seminars in basic science departments, for which they tailor presentations to the specific research and clinical interests of the respective audience. Presentations embedded in routine weekly departmental didactic conferences have been especially effective in beginning to transform the culture and establish an ongoing dialogue through which clinicians and researchers brainstorm about exciting new ideas and projects. These forums stimulate new evidence-based personalized and genomic medicine implementation projects to address clinically important problems.

The future of discovery, clinical and translational research, and implementation of personalized and genomic medicine lies with the next generations of

scientists and healthcare providers. For the past two summers, a multi-disciplinary team has conducted a four-week elective entitled “Personal Genomes in Medicine” for rising second-year medical students. As an educational exercise, students enrolled in the elective had the option of using their own personal sample for pharmacogenomic testing using the Affymetrix Drug Metabolism, Excretion and Transport (DMET™) test.

This experience proved very successful as a learning tool and in demonstrating to students the utility of pharmacogenomics. In the fall of 2013, DMET™ testing was also offered to pharmacy students in the “Advanced Pharmacogenomics” elective, and this summer all rising second-year medical students at the SOM, not only those in the elective class, will have the same opportunity. Their DMET™ results—either their own or from a de-identified control—will be used as a learning tool throughout their second-year curriculum. The goal is that, through the investigation of their own genomes, students will gain new knowledge and champion the application of pharmacogenomics and personalized medicine during their third- and fourth-year clinical rotations and beyond.

Along with Alan Shuldiner, MD, the John L. Whitehurst Endowed Professor, Department of Medicine, and Director of the Program in Personalized and Genomic Medicine, Miriam Blitzer, PhD, Professor, Department of Pediatrics, heads this collaborative effort, which requires input from multiple schools. This is a fine example of how we are “many schools but one University” at the University of Maryland, and how the Program for Personalized and Genomic Medicine is working to redefine collaboration.



So Long and Farewell to the Class of 2014

Monsoon-like weather could not keep the smiles off the faces of the Class of 2014 as they received their doctoral hoods in a special graduation ceremony at the Baltimore Convention Center on May 16, 2014. “As your Dean for the last four years, I have witnessed your growth, your ups and downs, and the perseverance that has culminated in your graduation today,” said E. Albert Reece, MD, PhD, MBA, Vice President for Medical Affairs, University of Maryland, and the John Z. and Akiko K. Bowers Distinguished Professor and Dean, University of Maryland School of Medicine. “I imagine that it is with both excitement and trepidation that you anticipate taking the time-honored oath of our profession. Of course, you undoubtedly also feel an incredible sense of pride and gratitude, because what you have achieved over the last several years is an outstanding accomplishment. It is to be expected, however, that today also brings with it some understandable anxiety,

as the enormity of your life-long commitment to the care of others continues to unfold.”

Entering medicine at a time of uncertainty, with a vastly changing healthcare system, and new and emerging life-saving technologies, Dean Reece encouraged the students to let go of that anxiety and take advantage of the chance to make their mark in medicine. “Seek and seize opportunities to challenge and change established practices,” he said. “Become a leader within our profession, and advance our noble cause with great urgency.”

Dean Reece also encouraged students to do what they love and let their passion power their persistence. “I believe this is one profession where the difference between love and apathy can be the difference in life and death for those you serve,” said the Dean. “As I reflect on my own personal and professional experiences, I can attest to the fact that doing what you love is, indeed, a strong indication that you are doing what you were meant to do. Whether you are treating patients, unlocking the mysteries of health and disease, or mentoring the next generation of physicians and scientists, I hope you find the same profound joy that has inspired me to lead with the expectation of pursuing excellence, every day.”

Keynote speaker Governor Martin O’Malley is well-acquainted with the excellent physicians produced here at the School of Medicine, as he has encountered many of them while visiting with firefighters, police officers and other public servants who have been hurt in the line of duty and saved by University of Maryland doctors. “I know this institution well enough to know that anyone receiving medical care from you will be grateful for the heart that has driven you to reach this milestone,” he said.

The governor admitted, though, that he believes there is a certain madness in the path our young doctors have chosen. “I don’t mean that as an insult, merely an observation,” he explained. “You are among the view human beings

on this planet who are choosing to write your story in the spaces the rest of us wry to hide from—sickness, death. You choose to write in the first person for the next person the story of looking mortality square in the eyes.”

Choosing medicine wasn’t a crazy choice for David Knipp, who is a fifth-generation graduate of the University of Maryland School of Medicine, but it was a choice. “I was never pushed into medicine,” he said. “I came about it through my own passions, and I think that is the way it should be. And because of that, I will enjoy practicing medicine for years to come.” As for the legacy of having five generations of fathers and their sons attend the school, “I couldn’t be prouder to be part of the Knipp family and carry on the medical legacy that we have here in Baltimore.” David was this year’s recipient of the Faculty Gold Medal for Outstanding Qualifications

for the Practice of Medicine, which honors graduates with outstanding scholarly accomplishments and those qualities of humanity and dedication most desirable in a physician. Like his father Harry, Class of 1976, David is going into Radiology.



Clockwise from top: Fifth-generation graduate David Knipp; GPILS graduates; Class president Joey Mechak; Keynote speaker Governor Martin O’Malley; A student being presented with her doctoral hood.

At bottom: PTRS graduates



It was a rainy day four years ago when the Class of 2014 put on their white coats for the first time, “and now we’re here graduating,” said class president Joey Mechak. Although in his speech to the class he compared this medical school journey to a marathon, he still said the time had “flown by. It’s really kind of hard to believe that we’re finally here.” He encouraged his classmates to “look back and see how far we’ve come. We’re no longer those eager, anxious medical students at the starting line, we’re now competent, caring doctors and finishers in this med school marathon. We should take this day to be proud of all we’ve accomplished, to remember and reflect on what we’ve learned from everyone here at Maryland, and to thank all of those who helped us reach this finish line.”

Looking beyond medicine here at the School of Medicine, pre-commencement celebrations were also held on May 15 for students pursuing degrees other than an MD. These ceremonies included the Department of Physical Therapy & Rehabilitation Sciences (PTRS), the Department of Medical & Research Technology, the Pathology Assistants program, the Master’s in Genetic Counseling program, the Masters in Public Health program, PhD graduates, and the Graduate Program in Life Sciences (GPILS). The University of Maryland, Baltimore’s graduation ceremony was held on the afternoon of May 16, but the traditional procession from University Park to the First Mariner Arena was cancelled due to the weather.





Students Step into Scholarly Research Roles

Many rising second-year medical students will spend the summer experimenting, studying and analyzing in an attempt to answer pressing medical questions. Topics will range from the comparison of tendon transplant outcomes in brachial plexus injury to understanding breast cancer drug resistance. The Class of 2017 is tackling these and additional research projects to fulfill new initiatives put forth by the Foundations of Research and Critical Thinking (FRCT) course, launched in August 2013. The newly required research course was designed to foster medical students' scientific curiosity while preparing them for the challenges of clinical research.

Class President Elie Miller will look at the results of double-tendon and single-tendon transplants in brachial plexus repair for pediatric patients. He will travel between UMMC and hospitals in Philadelphia to compare children's midline movement outcomes. "In today's day and age, clinical medicine and medical research are not separate fields. They come hand in hand," he said. "Even if a student intends to be a full-time clinician and not practice research it is still incumbent on them to understand research."

Early in their first year, the Class of 2017 had to choose a scholarly project. Their research could take place over the summer or become a longitudinal research project spanning their years of medical school. Alternatively, the requirement might be fulfilled by a fourth-year research elective month. Throughout the year these students have been guided by the Office of Student Research to identify physicians and

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research mentors. They also attended didactic and small-group sessions covering topics such as the basics of statistical analyses and the ethics of approving novel drug therapies.

Anthony Kronfli, class vice-president, emphasized the need for students to stay abreast of emerging treatments in medicine. "You have to keep up with the

new studies published and clinical trials, because by the time [that treatment] hits the market doctors will need to know a lot about it," he said. "The good, well-known universities in this country are involved in these discoveries and advancing clinical medicine." Kronfli came to medical school with significant biochemical research and was excited to expand his experience into clinical endeavors. He will be examining new drug therapy through levels in monkeys who have undergone heart transplants. Kronfli hopes this will lead to drugs with better efficacy that can guarantee more reliable graph acceptance. "With biochemical research you have to dig deep to see real-world applicability," he said. "Here you can see it."

Classmate Richa Kalsi will work in Dr. Angela Brodie's lab, looking at certain proteins' functional role in mediating aromatase inhibitor resistance. She feels this research will allow her to delve into the finer points of oncology. "My studying tends to be peppered with questions more detailed than we always get in lecture," she said. "I appreciate the opportunity to explore something I like and get into the level of what we know and don't know."



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