



SPECIAL ISSUE: Shared Vision 2020 for UM Medicine

DEAN'S MESSAGE: What's On My Mind

What's on my mind this month is the new Shared Vision 2020 plan for University of Maryland Medicine, which is aimed to accelerate the pace of discovery, collaboration, innovation and quality of patient-centered care across the Medical School and Medical System. Our new vision is meant to position us for maximum and extraordinary success in the face of the challenging times upon us. Together with our UMMS partners, we have decided to apply strategic, bold and different approaches to all our key mission areas—education, clinical care, finance and philanthropy, and research.

Last month, we distributed a summary of our “Shared Vision 2020 for UM Medicine,” which I hope many of you have had a chance to review and share with your colleagues, students, staff and trainees. This special edition of SOMnews will focus on aspects of Vision 2020 that are specific to the School of Medicine, and some of the initiatives already under way.

Despite the current economic climate and uncertainties regarding the future of academic medicine in general, and research funding in particular, **difficult times call for innovative thinkers who not only face challenges head-on, but welcome the opportunity to think strategically and think opportunistically.** Although limited resources could be used as an excuse to make conservative decisions, true leaders need to make bold choices to avoid the pitfalls of inertia, which can easily lead to decline over time. **This is why the key component of our Vision 2020 plan is to implement selective, strategic disruptive innovations across all our mission areas, starting in fiscal year 2014.**

The impetus behind this initiative is to take the idea of “disruptive innovation,” coined by Clayton M. Christensen, MPhil, MBA, the Kim B. Clark Professor



Christensen defines disruptive innovation as a process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves up the market, eventually displacing established competitors. By analogy, we will use this technique to displace the obstacles we face as we plan our future.

Over the course of the next seven years, we will apply selective, strategic disruptive innovations as we strive to accomplish the following:

- **In education**, we will transform our teaching philosophy and educational “products” by promoting student-driven innovation and discovery.
 - **In clinical care**, we will aim to become unquestionably the premier healthcare system for the State and region, distinguished by our clinical destination centers of excellence in many key areas.
 - **In finance and philanthropy**, we will work to attain a philanthropic goal well in excess of \$500,000 million through partnership, exploration of new revenue streams and strategic re-investment of reserve funding.
 - **In research**, we will make discoveries that significantly change the direction of scientific research and health care by tackling “Big Science” questions through team science initiatives and research consortium units, accompanied by huge federal funding support.
- In the past seven years we have seen extraordinary growth in virtually all mission areas, including an approximately 35 percent growth in total revenue, through increases in the number**

of grants and contracts, percentage of gifts, growth of the medical service plan, and other key areas. **We have achieved top-tier status and have become a national leader in clinical and academic medicine, as well as biomedical research, by adopting a fierce, goal-oriented, aggressive, strategic and opportunistic approach to maximize our academic yield.** While our historical performance will inform our efforts and help to shape us and influence our way forward, we cannot merely “rest on our laurels,” but need to adapt, modify and allow room for strategic disruptive innovations to continue our trajectory of success.

Vision 2020 is a culmination of ideas that came together through many discussions with senior staff, colleagues, ad-hoc advisory committees, and the input of the Research Affairs Advisory Committee. I am grateful for their invaluable assistance during the initial planning stages. However, now we need to put our philosophical position into practice and move Vision 2020 forward. The leadership cannot do this without the willingness of the entire SOM community to join us in this endeavor. The programs and initiatives you will read about in this special issue are just the beginning of how Vision 2020 can and will be implemented across the School.

As the summer comes to a close, and we turn our thoughts to the coming academic year, I hope these stories will serve to inspire and stimulate your own bold and strategic ideas for your academic unit.

In the relentless pursuit of excellence, I am

Sincerely yours,

E. Albert Reece

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



of Business Administration at Harvard Business School¹, and translate this idea, which was originally applied to the business world, into a driving principle for our Vision 2020. Christensen's series of books on innovation and growth in the business, education and health care sectors ultimately concludes that good organizations fail because leadership places too much emphasis on the principles and practices that brought them success in the past (i.e., sustaining practices), rather than actively seeking or allowing room for “disruptive innovation.”

¹Christensen CM. The innovator's dilemma: the revolutionary book that will change the way you do business. Reprint ed. New York (NY):HarperCollins Business Essentials; c2003. 336 p.

► BY KAREN ROBINSON

A Strong Educational Foundation in Research & Critical Thinking

The University of Maryland School of Medicine has implemented a new course to stimulate critical thinking and enhance intellectual acuity and inquisitiveness in medical students, in order to prepare them for the challenges of clinical practice or research. The course—called Foundations of Research and Critical Thinking—strengthens the curriculum’s focus on research and critical thinking by requiring each medical student to create and execute a scholarly scientific research project. Each student will select a mentor for his/her project, prepare a proposal, and complete either a clinical, translational, or basic science research project or a grant application. The course represents an innovative approach to medical education that is in place in few medical schools nationwide.

The Foundations of Research and Critical Thinking course has two components. First, in their first year of medical school, students will take part in a series of lectures and small-group sessions. Lectures will focus on topics such as “The Physician as an Academic Investigator,” “How to Critically Evaluate and Write a Scientific Paper,” and “Ethical and Responsible Conduct of Research.” The second component of the course is a scholarly project that for most students will take place during the summer between the first and second years of medical school.

“We are enhancing the skills of our students to include intellectual acuity and critical thinking, enabling them to become sharper physicians and biomedical scientists.”

For their scholarly project, students will develop a proposal for a basic, translational, or clinical biomedical research project. With the assistance of their mentor, they will complete the research project and submit a final report summarizing their work. As an alternative, they can complete an extensive grant application describing a research hypothesis and project. Students may also satisfy the requirements of the course by completing one

of the school’s dual-degree programs, combining the medical degree with a PhD or a Master’s degree—the combined MD/MPH (Master of Public Health) program, for example.

“This is the latest step in our ongoing effort to make our medical education comprehensive, teaching our future doctors every aspect of medicine, from science to patient care,” says George Fantry, MD, Assistant Dean for Student Research and Education and Associate Professor, Department of Medicine. “We are enhancing the skills of our students to include intellectual acuity and critical thinking, enabling them to become sharper physicians and biomedical scientists.”

“We hope that they will use these skills to provide better patient care and revolutionize medicine with biomedical innovation,” says Donald R. Matteson, PhD, Associate Professor, Department of Physiology, and Director of Student Research Education and the dual degree programs. “They’ll use these skills in problem-solving as they diagnose and treat patients, or as scientists, as they create and study research hypotheses to advance medicine. This course is keeping the University of Maryland School of Medicine in the top tier of medical schools, providing students with the best education possible.”



George Fantry, MD



► BY CAELIE HAINES

New Critical Care Resuscitation Unit



James O'Connor, MD

A new Critical Care Resuscitation Unit (CCRU) opened at the R Adams Cowley Shock Trauma Center on July 18, 2013.

The CCRU is designed to improve the flow of critical-care patients to appropriate patient care areas at the University of Maryland Medical Center (UMMC). “The CCRU will focus on critically ill patients with advanced surgical specialty needs who are transferred from outside hospitals,” explained Lewis Robinson, MD, PhD, who is medical director of the new unit.

“Examples of patients include those with acute care surgical or soft tissue problems, cardiothoracic and vascular emergencies, as well as neurological and neurosurgical emergencies.”

Over the course of only a few hours, CCRU patients are evaluated by a nurse practitioner and attending physician, stabilized, and then sent to a bed in an appropriate critical-care unit. These patients come from outside hospitals that are not able to offer the same level of care that is available at UMMC. The CCRU streamlines the process for the referring physician, so with one phone call a patient can be on his/her way to definitive care at UMMC, and “everyone is on the same page about how

we’re going to handle this patient,” said James O’Connor, MD, Associate Professor, Department of Surgery and Chief of Critical Care at Shock Trauma. “That’s really important. You want to streamline the process for the referring physician, and yet you want to make sure that the care the CCRU is providing is exactly the care that referring physician wanted for that patient. It will be a collaborative effort here.”

Collaboration in health care will become more and more necessary as the Affordable Care Act and other big changes in medicine start to make an impact. “Regionalization of surgical critical care services is an important aspect of the changing healthcare environment, and the CCRU will assist UMMC in being a regional and national leader in a high quality, systematic approach to regionalization,” said Dr. Robinson. “To our knowledge, this novel effort is the first of its kind in the US, and it promises to keep UMMC at the forefront of innovative surgical critical care.”

The staff of the CCRU is comprised of experienced Shock Trauma personnel. “The CCRU will be staffed 24/7 with University of Maryland Shock Trauma Center (STC) and School of Medicine critical-care physicians, who will work collaboratively with nurse practitioners and physician assistants, critical-care nurses, and respiratory therapists,” said Dr. Robinson. “The CCRU will also benefit from STC pharmacists’ consultation, and utilize the diagnostic and therapeutic resources of STC.”

Eventually the CCRU will be an eight-bed unit, but it will start with four beds and ramp up from there. “This is a brand new unit, a brand new service, and a totally new way of doing business, so we wanted to start a little smaller,” said Dr. O’Connor. Even with just four beds, there will be a constant flow of patients into and out of the unit.

“Patients will not receive their definitive care here—they will come and get what resuscitation they need and the appropriate tests, in coordination with the ICU team or other service where the patient might be going for definitive care,” said Dr. O’Connor. Added Dr. Robinson, “The ideal length of stay will be 6-8 hours, until the patient either goes to the operating room or to a long-term specialty ICU for definitive management (e.g. the surgical ICU).”

As Dr. Robinson mentioned, this unit will be the first of its kind in the U.S. “There is literature out there about this concept, but to our knowledge, no one has actually operationalized this,” said Dr. O’Connor. “It’s quite exciting.”

Examples of patients include those with acute care surgical or soft tissue problems, cardiothoracic and vascular emergencies, as well as neurological and neurosurgical emergencies.

► BY JULIE WU

Genomics Collaboration

Team Science Tackles Tough Questions About Personalized Medicine



Claire M. Fraser, PhD, Director, Institute for Genome Sciences, and Alan Shuldiner, MD, Associate Dean for Personalized Medicine

Our knowledge of the complete sequence of the human genome, a growing understanding of how variation in the human genome is related to thousands of diseases, and the advent of rapid, affordable genomic technologies have made precision or personalized medicine—using a person's genetic information to tailor diagnosis and medical treatment—a reality. A dedicated team of clinicians, physician-scientists and biomedical investigators is needed to translate this knowledge into routine patient care. **At the University of Maryland School of Medicine, such a team of faculty investigators—composed of experts from the Program in Personalized and Genomic Medicine (PPGM) and the Institute for Genome Sciences (IGS)—have started working together to address some of the challenges that personalized medicine presents.**

One of the new PPGM-IGS joint projects is sequencing the exons (the sections of a person's genome that are translated into proteins) of children with illnesses that have escaped diagnosis, despite many thousands of dollars spent on conventional diagnostic testing—so-called diagnostic odysseys. However, there are numerous issues when physicians and researchers begin to “hunt” for mutations that may cause disease.

“For example, what if a physician orders genome sequencing for a patient to test for mutations that predispose to breast cancer, and as a result, may discover that the patient also has a mutation that is highly linked to Alzheimer's, a disease for which there are currently no good treatment alternatives,” says Alan Shuldiner, MD, the John L. Whitehurst Professor of

Medicine, Associate Dean for Personalized Medicine, Head of the Division of Endocrinology, Diabetes and Nutrition, and Co-Director of the University of Maryland Clinical and Translational Research Institute. “The identification of incidental findings—in this case, finding risk for Alzheimer's when searching for risk for breast cancer—caused by sequencing a person's genome poses non-trivial ethical, legal, diagnostic and treatment implications. Furthermore, if this information becomes part of a patient's medical record, how this information may affect health and life insurance rates needs to be carefully considered.

“Fortunately the federal Genetic Insurance Non-Discrimination Act (GINA) provides some protection from these potentially devastating consequences, but they fall short, and additional laws will be required to properly protect patients from genetic discrimination,” Dr. Shuldiner adds.

Scott Devine, PhD, Associate Professor of Medicine, and one of the IGS faculty members on the collaborative team, is overseeing the exon sequencing. As a co-principal investigator on one of the world's largest projects to catalog human genetic variation, the 1000 Genome Project, Dr. Devine is a sequencing expert and describes some of the technical barriers to widespread personalized medicine.

“A big challenge is that the raw data obtained after sequencing just one person's genome is very large,” Dr. Devine says. “Therefore, as we begin to sequence multiple people's genomes, we need to consider who will store this data, how much of this data will be useful to diagnosing patients, and how will physicians interpret this data in order to have meaningful conversations with their patients. In the case of people with rare diseases, we also need to think about creating a database of their mutations, because this information could be essential to helping others who display the same symptoms.”

To start to address some of the major issues which arise when doctors and researchers begin to hunt for mutations that may cause disease, the School of Medicine developed an elective course for second-year medical students, called the “Role of Personal Genomes in Medicine.” Drs. Shuldiner and Devine, along with other University of Maryland faculty, have taught portions of the course.

“During the course, the students receive an opportunity to genotype their own blood for genetic variants that predict response to various drugs, as well as risk for adverse side effects,” says Dr. Shuldiner. “It is very powerful for the students to review their own data to determine which medications they would be predicted to respond or not respond to and which drugs they should avoid due to an increased risk of adverse side effects. The exercise illustrates the utility of how they will use genetic information as physicians to more effectively prescribe medications to their patients.”

As PPGM and IGS continue to work collaboratively, and with others, on projects in personalized medicine, core team members recognize that as they begin to analyze the genetic information collected from patient samples collaborations will also be needed with colleagues from the School of Law, School of Pharmacy, and the School of Social Work. According to Drs. Shuldiner and Devine, discussions with faculty across the campus have already begun.

“Five years ago, it took weeks to sequence a person's genome, and now it takes just a little over a day,” reflects Dr. Devine. “In five years from now, the entire industry will change, and the role of our team and others doing this type of work is to create a space to understand, study, safeguard, and responsibly use all the data we will collect about a person's genetic makeup to help improve human health.”

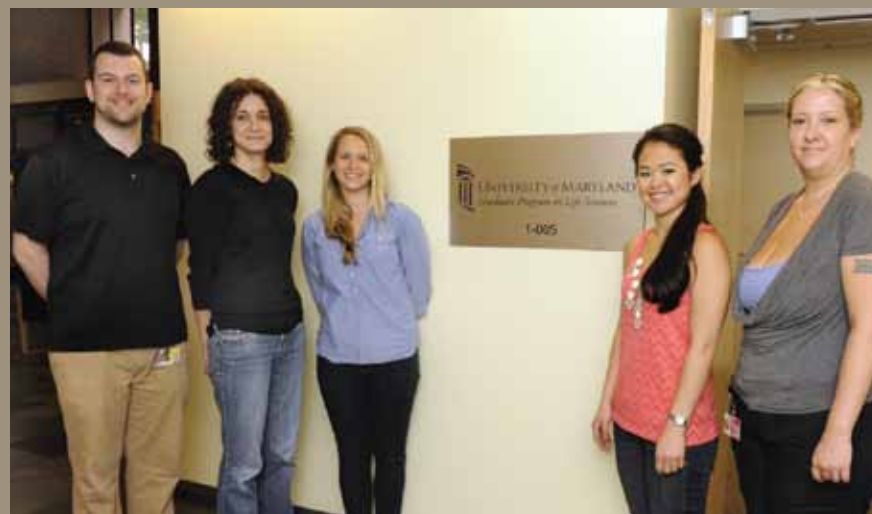
Science Communications Internship

The Graduate Program in Life Sciences (GPILS) and the Office of Postdoctoral Scholars (OPS) have partnered with the Office of Public Affairs (OPA) in the School of Medicine to offer a new internship opportunity for graduate students and postdoctoral fellows in Science Communications.

The internship started in June with lectures by OPA staff on Writing for Public Relations, Media Relations, Research Communications, Social Media, and Digital & Broadcast Media. It will culminate in a hands-on internship working on gathering stories and other content that may be used for the School of Medicine website, press releases and future issues of SOMnews.

The inaugural class of interns are:

- Katie Howell, *Graduate Student, Program in Microbiology and Immunology*
- James Irving, *Graduate Student, Program in Neuroscience*
- Elyse Sullivan, *Graduate Student, Program in Neuroscience*
- Renee Cockerham, *Postdoctoral Fellow, Department of Anatomy and Neurobiology*
- Kelly Beazley, *Postdoctoral Fellow, Department of Biochemistry and Molecular Biology*



Left to right: James Irving, Renee Cockerham, Elyse Sullivan, Katie Howell and Kelly Beazley

First “Festival of Science” to Accelerate Innovation and Discovery in Medicine

► BY JULIE WU



Francis Collins,
MD, PhD

On November 22, 2013 the School of Medicine will launch a major initiative, ***Accelerating Innovation and Discovery in Medicine***, aimed at significantly and measurably increasing the pace and scope of clinical and basic sciences research that ultimately impacts human health. **A cornerstone of this initiative will be the formation of an external Scientific Advisory Council, which will visit us annually and provide critical advice** on our research portfolio, programs and plans, as well as offer guidance and support for junior faculty presenters.

This effort will be kicked off with a full-day symposium, the “Festival of Science,” to celebrate the groundbreaking research being conducted on campus. To celebrate this auspicious event, **Francis Collins, MD, PhD**, Director of the National Institutes of Health, will give the inaugural keynote address.

The first Scientific Advisory Council consists of five internationally acclaimed biomedical researchers and physician-scientists:

Rita Colwell, PhD

- Professor and Chair, US Life Sciences at UMCP • Former Director, National Science Foundation
- 2006 National Medal of Science recipient

Carol Greider, PhD

- Professor & Chair, Molecular Biology at JHU • Awarded 2009 Nobel Prize for Physiology or Medicine • Member, Institute of Medicine of the National Academies

Philip Needleman, PhD

- President/CEO, St. Louis Science Center • Member, Institute of Medicine of the National Academies • Former President, Searle R&D

Ralph Snyderman, MD

- Chancellor Emeritus, Duke University & James B. Duke Professor of Medicine • Former President & CEO, Duke University Health System • Former Chair, Association of American Medical Colleges • Member, Institute of Medicine of the National Academies

Elias Zerhouni, MD

- President of Global R&D, Sanofi Pharmaceutical • Former Director, National Institutes of Health • Member, Institute of Medicine of the National Academies

“I am thrilled that, arguably, the world’s most preeminent scientists have agreed to be a part of this important initiative,” said Dean E. Albert E. 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. “When I invited these distinguished scientists to join us for this important project, not only were they eager to help, several of them mentioned how impressed they were with the dynamic progress the School of Medicine has made over the past several years,” added the Dean.

Three academic units will be featured each year at the Festival of Science to showcase the breadth and depth of the work ongoing at the School of Medicine. The symposium will give presenters an opportunity to receive feedback and advice from the Scientific Advisory Council and their colleagues during the open sessions. Presenters and School of Medicine leaders also will have the chance to speak with Council members during small-group meetings. This year, projects from the Department of Pharmacology, the Department of Surgery, and the Institute for Genome Sciences will be highlighted, which will reflect a sampling of our robust basic, translational and clinical research portfolio.



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