

## Unique training brings young scientists up to speed in translational research

Curtis Pickering



### TRIUMPH POSTDOCS

At the intersection of basic science and clinical medicine is translational research. Translational research includes aspects of both disciplines and encompasses a variety of research projects, with the aim of understanding and developing treatments for disease. This specialized field requires specific skills that are not taught in traditional graduate and medical school education. Although there are many training opportunities for physicians who are interested in translational research, early-career scientists have limited training options in this field.

A group of translational cancer researchers at the MD Anderson Cancer Center recognized this disparity and, in response, they designed the TRIUMPH (Translational Research In Multi-Disciplinary Program) program, which welcomed its first class of fellows in Fall 2008. TRIUMPH's goal is to prepare basic scientists for a career in translational cancer research. The program supplements traditional postdoctoral research with clinical and translational education, clinical experience and mentoring. TRIUMPH is one of the only translational research postdoctoral programs in the USA and many aspects of this particular program are unique. One such aspect begins even before day one: rather than joining a specific lab, fellows arrive at MD Anderson before choosing a research laboratory. The first few weeks are spent in interviews with MD Anderson faculty involved with the program. Currently, about 30 researchers are affiliated with TRIUMPH and they represent a broad spectrum of research interests, laboratory environments and mentoring styles. Although it can be disconcerting to relocate for a postdoctoral position without knowing which lab you will be working in, the initial interview process allows the new fellow to explore the diversity of research at the MD Anderson Cancer Center and find the right laboratory to match his or her interests. The interviews also allow the fellow to meet many great researchers who could become future collaborators or mentors as their career progresses.

Another unique aspect of the TRIUMPH program is its curriculum. Fellows take five courses in topics relevant to translational research, such as medical school histology, and clinical trial design and management. These courses are not a part of most graduate school education and are rarely available to postdoctoral fellows, however, in TRIUMPH they will serve as

an introduction to clinical language and clinical perspectives on research. Since the fellow's future career relies heavily on effective communication with clinicians, these courses will prove valuable during future discussions and collaborations with clinicians.

Clinical rotations are an additional part of the TRIUMPH curriculum. Each fellow participates in five clinical rotations that are tailored to personal interests but include rotations in radiation oncology, pediatrics, surgical oncology, medical oncology and investigational cancer therapeutics. During these 2-month rotations, the fellow is exposed to all aspects of cancer care, including presentation and diagnosis in the clinic, discussion of treatment options, effects of treatment and development of therapeutics. This experience is intended to present the entirety of the disease and the diversity of the unmet clinical needs that can be addressed by translational research. These rotations, completed during the second year of the program, also serve as an opportunity for the fellow to interact with clinicians and learn specific characteristics about each tumor type. For example, breast cancer and lung cancer are dramatically different diseases from presentation to treatment, and these clinical differences should influence how each disease is studied in the laboratory.

In many postdoctoral fellowships, there is no formal mentoring program and finding guidance is the sole responsibility of the fellow. However, mentoring is an important aspect of TRIUMPH. The program provides a formal committee structure with several mentors besides the primary research mentor. This mentoring committee is analogous to a graduate student's thesis committee, following the fellow's progress and providing assistance as necessary. Members of the TRIUMPH executive committee also provide a resource for mentorship and may remain as active participants in the fellowship experience.

The TRIUMPH program is also a 3-year postdoctoral research fellowship, generously funded by GlaxoSmithKline. Fellows are expected to develop a translational-focused research project and publish their findings in high-quality journals. The MD Anderson Cancer Center is both a top-tier cancer hospital and a leading cancer research center, creating an ideal setting for training in translational research.

Overall, TRIUMPH is a new and unique postdoctoral program that fills a void in the available training opportunities for translational cancer research. It provides specialized training and mentoring that are usually not available to postdoctoral researchers. The program is focused on many aspects of translational research and is located at one of the top translational research institutions in the USA. Although the TRIUMPH program is still young, we are confident that it will prove successful and serve as a model for additional programs throughout the world.

Additional information about the TRIUMPH program is available at: [www.mdanderson.org/Prof\\_Education/Triumph](http://www.mdanderson.org/Prof_Education/Triumph).

*Curtis Pickering PhD (cpickering@mdanderson.org) is a TRIUMPH postdoctoral fellow investigating the role of miRNAs in the metastasis of head and neck squamous cell carcinoma in the lab of Dr Jeffrey Myers.*

doi:10.1242/dmm.003202

## Creative approaches in public science education

Cynthia Wichelman



L. Michael Brunt, MD, Professor of Surgery, shows MMS students how to use laparoscopic instruments. Photo courtesy of Washington University School of Medicine.

Universities and research institutions are exploring new teaching approaches to educate the public about biomedical science. At Washington University in St Louis, the Mini-Medical School and Science On Tap programs are stimulating students to think about medicine and research. These programs are heavily and enthusiastically attended; they infuse the public with a remarkable amount of information, and yet the students request even more sessions to further satisfy their growing interest in medicine and science research.

### Mini-Medical School

Now in its eleventh year, Washington University School of Medicine's Mini-Medical School (MMS; <http://minimed.wustl.edu>) provides the greater St Louis, MO, and Eastern Illinois community with the opportunity to learn more about medicine and to become better health care consumers. Students receive a behind-the-scenes look at the medical school and learn about diseases first hand from faculty experts. They can move away from potentially false information from the media or unverifiable internet resources.

The entire program consists of three 8-week sessions, each of which meets one night a week. Outside of the classroom time (Table 1), students can tour clinical and biomedical research

**Table 1. Mini-Medical School curriculum**

Level	Courses
MMSI	Lectures; hands-on suture/laparoscopy lab and an Alzheimer's testing lab; tours
MMSII	Lectures; physical examination and anatomy lab; physical therapy lab; microsurgery lab and CPR certification; tours
MMSIII	Grand rounds: presentation of patient cases follow lectures; tours

facilities. They learn how to access information about a variety of medical topics at the Bernard Becker Medical Library, they see the latest therapeutic techniques used at the Rehabilitation Institute of St Louis and they explore the Genome Sequencing Center where the human genome was mapped, and where new medical applications of genome sequencing are being explored and many new species are decoded each year.

MMS was first conceived and developed by Dr John Cohen at the University of Colorado in Denver, in 1989. Although most MMSs are supported by medical schools, some are funded by hospitals or other organizations such as the RAND Corporation. At their peak of popularity in the late 1990s, about 80 MMSs were offered across the USA, with several more in Canada, Ireland and even one in Malta. Fewer MMS programs exist now. The NIH Office of Science Education previously tracked MMSs, but unfortunately, as of this writing, its website is outdated and many of the MMSs listed are no longer offered.

Washington University's MMS remains a popular venue and each 8-week session has sold out since its inception in 1999. The cost of each course is US\$125.00, which includes the syllabus, lectures, labs, tours and dessert. MMS presentations encompass a vast array of medical topics, from pancreatic cancer, Parkinson's Disease and heart disease to medical ethics and business aspects of medicine. Complex material is tackled in an accessible style, with clarification of medical terms and interactive time for questions. Students experience labs and clinical situations from a hands-on approach, like a professional. For instance, the physical examination lab teaches students many aspects of conducting a physical exam, including the acquisition and interpretation of vital signs; head and neck exam; heart and lung exam; and abdominal exam. The anatomy lab enables students to 'glove up' and touch normal and diseased human organs, and the suture lab lets students test their level of surgical dexterity. In the final course, MMS III, students hear about diseases from doctors, as well as from patients themselves, and this leads to some of the most memorable evenings. The patients also enjoy sharing their personal stories at MMS III and seek to return each year.

Each MMS class has 115 students, with over 3500 graduates to date. Student backgrounds are diverse, including engineers, teachers, chief executive officers, artists, students, professors, lawyers and homemakers. A wide range of ages is represented, from teens to seniors. Students must be at least 15 years old to enroll, and our eldest enrolled student to date was 92 years old.

Several students have made a difference to the health of a loved one by noticing concerning symptoms and bringing the person to an emergency room in a timely fashion. Three students have used their newly acquired cardiopulmonary resuscitation (CPR) skills to save a life. Most graduates report that they feel more comfortable asking their physicians questions and that they use their appointment time more productively, for example, by giving a good medical history. Many students prefer to return to Washington University School of Medicine/Barnes-Jewish Hospital for their medical care, often to see a physician they heard speak at MMS. Students frequently report that they are very excited to share their new knowledge with others. Lecture topics change somewhat each year, which has led several students to take the series a second or even a third time.

The Washington University School of Medicine strongly supports community education and has funded MMS since its inception, despite operating expenses that exceed the revenue from tuition. Upon completion of MMS I, II and III, the students have obtained a great deal of medical knowledge, as well as a better understanding of how hospitals operate and the difficult ethical issues facing doctors and patients. Students take MMS because they want to learn more about medicine. Some are caring for a loved one at home; others are stay-at-home parents wanting to be better informed; some always wanted to attend medical school, whereas others will be applying to medical school; and for others, the knowledge will help them in their careers, such as in venture capital or law. MMS graduates can become savvy medical consumers and ultimately lead healthier, more productive lives.

### Science On Tap

A complementary public science program available at no cost to the St Louis community is Washington University's Science On Tap (<http://scienceontap.wustl.edu>). It is modeled after Café Scientifique (<http://www.cafescientifique.org>), a forum for discussing important and interesting scientific issues in an informal setting. Based on the first such cafes held in the UK, Café Scientifiques are held around the world, including in some remote rural villages; however, styles vary widely.

Science On Tap is in its fourth year and is held at the Schlafly Bottleworks in St Louis, a popular microbrewery that supports community events. On the last Wednesday of the month, it features presentations by Washington University faculty members outside the Medical School. Presentations are 25 minutes, followed by a lively, 1-hour discussion. PowerPoint is discouraged and only allowed to present crucial graphics. An average of 125 attendees fill the room with only an e-mail as a reminder. The varied subjects have included *Plants and People – Is Your Beer Green* by Barbara Schaal, PhD, Professor of Biology and *Time Glows By: Watching Biological Clocks Tick in the Brain* by Erik Herzog, Associate Professor of Biology. The diversity of attendees stimulates useful, cross-disciplinary discussions.

MMS and Science On Tap have both thrived because of Washington University's strong belief in community outreach and education; the university's dedicated and talented faculty who welcome the opportunity to disseminate their knowledge beyond the usual confines of academia; and because of the numerous members of the St Louis community who are always eager to learn more. The example set by these St Louis-based programs is indicative that medical and research institutions have much to offer their community.

*Cynthia Wichelman, MD, FACEP ([wichelmc@wustl.edu](mailto:wichelmc@wustl.edu)) is the Mini-Medical School Course Director, Science On Tap Moderator and Assistant Professor of Emergency Medicine at Washington University School of Medicine.*

doi:10.1242/dmm.003269

## DMM support for collaborative science

DMM Travelling Fellowships bring researchers with unique perspectives together to tackle challenging disease-related issues. These fellowships provide students, post-docs or clinical fellows with up to £2500 (or local currency equivalent) towards travel expenses to establish collaborations with a laboratory outside of their home institution. These collaborations should expand the breadth of the applicant's research into new areas and promote the understanding of disease processes or treatment through the use of model organisms.

### Congratulations to two recent DMM Travelling Fellowship winners:

#### *Neuroprotective agents released in breast-feeding mothers*

The best cure for neurological disease might be prevention. Very few therapies effectively treat neurological disorders, such as stroke, epilepsy, neurotrauma and neurodegenerative disease.

**América Vanoye**, a PhD student at the National Autonomous University of Mexico, is investigating the neuroprotective effect that breast-feeding has on mothers. Her work focuses on the effects of steroid hormones on the hippocampus. She uses lactating rats as a natural model to understand neuroprotection, which could be conferred by different hormones such as oxytocin, a pituitary hormone that stimulates milk ejection. With this award, her work is expanding to include collaborators at the Neurosciences Institute at Barcelona Autonomous University in Spain.

#### *New genes responsible for osmoregulation*

Salt balance influences a variety of conditions, such as blood pressure, gastrointestinal processes and renal function. However, the proteins involved in the normal and disease physiology of osmoregulation remain largely unknown. **Anne Sinke**, is a PhD student at Radboud University Nijmegen Medical Center in The Netherlands who works to understand the key regulators of osmoregulation in health and disease. His haplotype association mapping in mice identified a novel cation channel necessary for maintaining salt balance. This DMM fellowship makes it possible for Anne to extend his current mouse research through collaboration with members of the Jackson Laboratories in the USA. There, he will carry out metabolic experiments in transgenic mice and characterize this newly identified gene.

doi:10.1242/dmm.003277