Leadership in Scientific Education

The Graduate School of Biomedical Sciences has been training many of our nation’s finest scientists for more than four decades and inspiring them to translate their discoveries into effective treatments for human diseases.

Today, Mount Sinai is a leader in bringing “big data” to biomedical sciences, both in our laboratories and in our classrooms. By connecting with the Icahn Institute for Genomics and Multiscale Biology, the Graduate School has developed innovative courses that teach students how to use the new frontier of computational genomics in the laboratory setting. Many of our most devastating diseases are due to complex changes in our genes and how they interact with our environment. Our students learn how to embrace this complexity.

In the past year, we have developed and expanded courses specifically designed to teach young scientists how to work in teams, how to brainstorm to solve difficult questions, and how to transfer their knowledge to the private sector. Through courses such as “QED” (quod erat demonstrandum), “Translating Science,” and “Translational Neuroscience,” we are inviting lecturers from around the country to teach students how to achieve success in bringing therapeutics to the clinics.

continued on page 4

Alumni of Mount Sinai’s MD/PhD Program Advance Innovation

Wendy Rubinstein, MD, PhD: National Institutes of Health

As a young researcher at the Graduate School of Biomedical Sciences in the early 1980s, Wendy Rubinstein, MD, PhD, helped carry out some of the earliest work on transgenic mice in the lab of Jon W. Gordon, MD, PhD, a pioneer in the field of genetic engineering. This method of mammalian gene transfer research revolutionized biotechnology. Dr. Gordon and the late Francis “Frank” Ruddle, PhD, of Yale School of Medicine, had published seminal findings on the subject in 1980 and 1981.

Exposure to such cutting-edge research at Mount Sinai laid the foundation for Dr. Rubinstein’s successful career. She is now Director of the National Institutes of Health (NIH) Genetic Testing Registry, and a senior scientist at the NIH. Prior to this, Dr. Rubinstein was Clinical Associate Professor at the University of Chicago and Director of the NorthShore University HealthSystem Center for Medical Genetics, which provides care to patients with inherited diseases in the Chicago metropolitan area.

continued on page 4

For additional MD/PhD profiles go to page 3
Rigorous PhD Training at Mount Sinai Leads to Stellar Careers

Zachary Charlop-Powers, PhD: Rockefeller University

As a postdoctoral researcher at Rockefeller University in New York City, Zachary Charlop-Powers, PhD, is working to combat the rising problem of antibiotic resistance. In the Laboratory of Genetically Encoded Small Molecules, run by Associate Professor Sean F. Brady, PhD, Dr. Charlop-Powers is using bacterial genetics to mine the genomes of soil-dwelling bacteria for antibiotic-producing gene clusters.

“The majority of clinically used compounds come from bacteria,” he says, “but only a very small fraction of bacteria can be cultured in the laboratory. We can use genetics to explore the other 99 percent.”

Dr. Charlop-Powers credits his success as an investigator to the rigorous training he received at Mount Sinai, where he began his career as an assistant in the laboratory of Hugh A. Sampson, MD, Director of the Jaffe Food Allergy Institute, and Chief of the Division of Allergy and Immunology in the Department of Pediatrics, at The Mount Sinai Medical Center. It was there that his passion for basic science took hold, and he chose to pursue his doctoral degree under the direction of Ming-Ming Zhou, PhD, Professor and Chair of Structural and Chemical Biology, and Professor of Pharmacology and Systems Therapeutics, and Oncological Sciences.

Vincent Racaniello, PhD: Columbia University College of Physicians and Surgeons

Vincent Racaniello, PhD, Professor of Microbiology and Immunology at Columbia University College of Physicians and Surgeons, has done groundbreaking research on influenza viruses, poliovirus, echovirus, rhinovirus, and hepatitis C. Still, as important as research and teaching are to him, he revels equally in his role as a podcaster and blogger.

“I think it’s really important for scientists to communicate their work to the public,” says Dr. Racaniello, who hosts and produces three podcasts: This Week in Virology, This Week in Parasitism, and This Week in Microbiology. His listeners certainly include scientists, but also a diverse audience of students and nonscientists working in many fields. He also writes “virology blog.” Says Dr. Racaniello, “We take something obscure and try to appeal to the interests of a variety of people and engage them.” He has 17,000 students in his Virology course, which is available on iTunes.

Dr. Racaniello completed his PhD at Mount Sinai, studying genetic reassortment of influenza virus in the laboratory of world-renowned scientist Peter Palese, PhD, the Horace W. Goldsmith Professor of Medicine and Chair, Department of Microbiology. “It was the best thing I could have done. He was a fabulous mentor for me,” he says. As a postdoctoral fellow at the Massachusetts Institute of Technology, Dr. Racaniello used recombinant DNA technology to clone and sequence the genome of the small RNA animal virus poliovirus, ultimately generating the first infectious clone of an animal RNA virus, which revolutionized modern virology.

“Mount Sinai made me the scientist I am today,” says Dr. Racaniello. “I went into the scientific world fully prepared. Everything I do had its start here.”

Francesca Cole, PhD: MD Anderson Cancer Center

Francesca Cole, PhD, began her science career at Mount Sinai while still an undergraduate, studying factors regulating mouse and human muscle cell differentiation, in the laboratory of D. Stave Kohtz, PhD, Associate Professor of Pathology, and Oncological Sciences. After attending the Massachusetts Institute of Technology, she returned to Mount Sinai in 1996 to complete her PhD.

While at Mount Sinai, she joined the laboratory of Robert S. Krauss, PhD, Professor of Developmental and Regenerative Biology, and Oncological Sciences. “Dr. Krauss was a fantastic mentor and very supportive,” says Dr. Cole. “He was very demanding—in a good way—and trusted me to delve into new areas.” She also counts among her mentors Marek Mlodzik, PhD, and Paul M. Wassarman, PhD, the current and former chairs, respectively, of the Department of Developmental and Regenerative Biology.

Dr. Cole is now Assistant Professor in the Department of Molecular Carcinogenesis at the MD Anderson Cancer Center in Science Park, Texas. She has dedicated her career to understanding DNA double-strand break repair by homologous recombination to improve cancer diagnostics and therapies. Prior to joining MD Anderson last year, Dr. Cole spent seven years at Memorial Sloan-Kettering Cancer Center.

Dr. Cole remembers a strong bond among Mount Sinai’s scientists who, during a widespread power blackout in 2003, ran up and down 25 flights of stairs to help each other save their experiments after the outage compromised their freezers. “Mount Sinai was a great place to be,” she says. “We all worked very hard, but there was a joyful, supportive atmosphere. I was very happy there.”
Laura Coruzzi, PhD, JD: Jones Day

When Laura Coruzzi, PhD, JD, was a postdoctoral fellow in the Department of Microbiology in the late 1970s, she studied and isolated proteins, made antibodies, and believed she was heading toward a career in academia. She never imagined three decades later she would be named among the top 10 of America’s Best Life Sciences Litigators in the United States by Managing Intellectual Property.

By the early 1980s, however, two significant research and legal developments would influence her career path: gene splicing, which led to recombinant DNA technology and cloning, and a ruling by the U.S. Supreme Court that determined living organisms could be patented.

Dr. Coruzzi began to realize that with her research background, she could get a degree in law, and together they would help her have a greater impact in the emerging biotech field.

As she debated the move, she consulted acclaimed molecular and biochemical geneticist Robert J. Desnick, MD, PhD, Dean for Genetics and Genomic Medicine at Mount Sinai. “He gave me good career advice and guidance on how to present myself and my work,” says Dr. Coruzzi.

Today, Dr. Coruzzi is a partner at Jones Day in New York City, where she practices patent law related to the life sciences. “This has allowed me to use my knowledge of science to help companies introduce new drugs and vaccines to the world,” she says.

On Monday, April 15, Dr. Coruzzi will appear before the U.S. Supreme Court with a team from Jones Day for a case that will determine if human genes are patentable. She credits her training at Mount Sinai, particularly mentoring by Peter Palese, PhD, and Jerome L. Schulman, MD, Professor Emeritus of Microbiology, as well as her participation in seminars in which she had to present and defend her work, as building a foundation for the skills she uses when arguing cases in court. “I realize what a unique, forward-thinking program Mount Sinai has, and how fortunate I was to be a part of it,” says Dr. Coruzzi. “I have strong affection for Mount Sinai.”

James Rocco, MD, PhD: Massachusetts General Hospital

Early in his studies at the Graduate School of Biomedical Sciences, James W. Rocco, who received his MD/PhD in 1994, planned to pursue research in cardiovascular computer modeling. But, he says, Terry A. Kruwich, PhD, then Dean of the Graduate School, thought he would be interested in the new discoveries taking place in cancer biology, and urged him to work in a molecular biology lab.

Dr. Rocco says the high quality of his PhD training, and the expert faculty mentoring he received at Mount Sinai prepared him for the challenges of establishing and running an R01-funded research program through the National Institutes of Health.

“During my training, the Department of Otolaryngology at Mount Sinai was already regarded as a national leader in the surgical treatment and reconstruction of patients with head and neck cancer,” he says. This clinical exposure prepared him for a career in which to apply the best treatment for patients whose vital functions—such as eating, breathing, and speaking—are compromised by cancer of the head and neck.

“When I left Mount Sinai for residency training at Johns Hopkins [University School of Medicine], I planned on becoming a head and neck surgeon, with a research effort focused on the molecular biology of squamous cell carcinoma of the aerodigestive tract,” says Dr. Rocco. “And that is exactly what transpired.”

Yasodha Natkunam, MD, PhD: Stanford School of Medicine

Yasodha Natkunam, MD, PhD, says the fulfillment she received from her research rotations enabled her to flourish at Mount Sinai’s Graduate School of Biomedical Sciences. She received her doctorate degree in 1995 and her medical degree from Icahn School of Medicine at Mount Sinai in 1995.

A native of Sri Lanka, Dr. Natkunam arrived at Mount Sinai immediately after completing her undergraduate studies at Bryn Mawr College, with plans to pursue a career in pediatrics or internal medicine. But Dr. Natkunam, now a Professor of Pathology at Stanford School of Medicine and a member of Stanford’s Cancer Center, says she shifted her focus to include more research during graduate school, after working with several of Mount Sinai’s “intellectual giants.”

“My research training made me want to delve deeper into understanding the pathogenesis of the clinical manifestations I was seeing in patients,” she explains.

Dr. Natkunam credits several professors for inspiring her during her years at Mount Sinai, including: Kurt Hirschhorn, MD, Professorial Lecturer in Pediatrics and Genetics; and Adrian Greenstein, MD, Professor of Surgery. From Dr. Hirschhorn, she says she learned “the subtleties of the physical examination.” And from Dr. Greenstein, she says she learned to “appreciate the myriad complications of Crohn’s disease.”
Leadership in Scientific Education (continued from page 1)

Working with the Center for Technology, Innovation, and Entrepreneurship, students learn how to start their own companies, navigate the interface between law and science, and bring ideas to the marketplace. The Graduate School is preparing to formalize this approach through a new PhD track: Design, Technology, and Entrepreneurship. This will represent another first in a series of innovative training tracks at Mount Sinai, where students in our Master of Science, PhD, and combined MD/PhD programs will be formally trained in the new world of applied science. Such educational innovation will keep Mount Sinai at the forefront of training new scientists whose knowledge will lead to breakthroughs in the treatment of disease.

Mount Sinai's proud history of breaking new ground continues today with discoveries in areas such as enzyme replacement therapy and the use of stem cells to model disease. Our students are inspired by Mount Sinai's history and the important roles our alumni continue to play in advancing innovation.

Women in Science

Women in Science (WiS) provides female graduate students and postdoctoral researchers at Mount Sinai with a network of support and mentorship. The group extends access to professional development and outreach opportunities.

For additional information on WiS and upcoming events, email SinaiWiS@gmail.com.

Wendy Rubinstein, MD, PhD: National Institutes of Health (continued from page 1)

Dr. Rubinstein says her appreciation for the people who have donated their time and energy to education and research started during her first year at Mount Sinai and continues today.

One of those people was the late Marjorie Guthrie, widow of folk singer Woody Guthrie, who had visited Dr. Rubinstein's class at Mount Sinai to discuss her husband's struggle with Huntington's disease, an incurable, genetically transmitted degenerative disease of the nervous system. As a result of her husband's illness, Mrs. Guthrie had become an advocate for biomedical research, speaking before Congress and founding what later became the Huntington's Disease Society of America.

"I wasn't just sitting in class being lectured to. There were real-life experiences woven in" to the Mount Sinai curriculum, which made it more interesting, says Dr. Rubinstein. Later on in her career, she says she treated others with Huntington's disease, and did HTT gene testing at the bench.

Four Deans have presided over the Graduate School of Biomedical Sciences:

Irving L. Schwartz, MD 1965-1980
Terry A. Kruwlich, PhD 1981-2002
Diomedes E. Logothetis, PhD 2003-2006
John H. Morrison, PhD 2006 - present

Announcement

Revisit Weekend

The Graduate School of Biomedical Sciences will host its annual Revisit Weekend for its PhD and MD/PhD candidates, Thursday, April 4 – Saturday, April 6. Ramon E. Parsons, MD, PhD, the Ward-Coleman Chair in Cancer, and Chair of the Department of Oncological Sciences, will be the keynote speaker. To learn more about the program, go to www.MyGSocial.com.

Thursday, April 4 – Saturday, April 6

Events Include:

Keynote Address:
Thursday, April 4
2:15 pm
Hatch Auditorium

Faculty Poster Presentations:
Thursday, April 4
4:15 pm
Guggenheim Atrium

Mount Sinai

INSIDE MOUNT SINAI
2013 Marketing & Communications
Carrie Gottlieb, Editor
Marilyn Balamaci, Editor

SUBMISSIONS
Box 1475
inside@mssm.edu

VISIT INSIDE ON THE WEB
www.mountsinai.org/inside

To find out what's happening right now, follow Mount Sinai on Twitter @MountSinaINYC

Visit us on Facebook
facebook.com/mountsinainyc