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Dean's Research Newsletter, Spring 2020

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I am particularly gratified to witness the innovative research underway here at New York Medical College (NYMC). As we face this enormous health crisis, it is through research that we will advance all of the countries around the world in developing new treatments for COVID-19 and other serious health issues facing our nation. That is why I am proud to see so many timely research projects already taking place here for, as we know, research drives clinical practice. News of some of that invaluable research being conducted by our faculty and students, is included in this newsletter. I look forward to sharing more updates in future issues.

Facilitating research is very important for both our faculty and students. Christopher S. Leonard, Ph.D., professor of physiology, is chairing the Research Support Services Committee, which will be working to identify how we can further support research. The Committee recently conducted a survey of our faculty to gain their vital input as we seek ways to improve the research and

scholarship environment at NYMC.

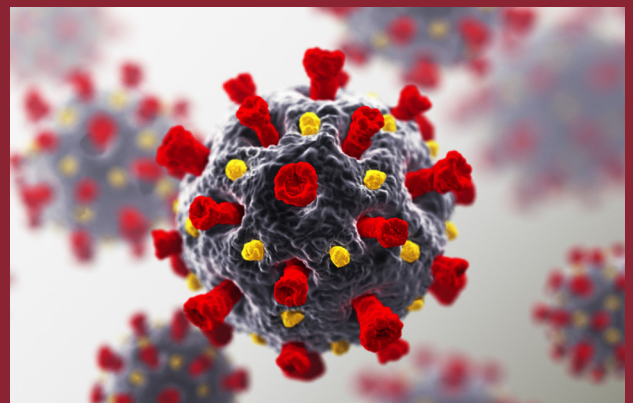
Congratulations to everyone as you continue your research, collaborations and success in securing grants. Be safe and well.

Jerry L. Nadler, M.D., MACP, FAHA, FACE
Dean of the School of Medicine
Professor of Medicine and Pharmacology

Recommended Article
in the *Westchester County Business Journal*

Seeking a Cure: Regeneron and NYMC
in COVID-19 Study

Salomon Amar, D.D.S., Ph.D., vice president for research & professor of pharmacology, microbiology and immunology
Lawrence J. DeLorenzo, M.D., professor of medicine
Donald S. Chen, M.D., assistant professor of medicine
Alison T. Lennox, M.D., clinical assistant professor of medicine and pediatrics



NYMC Collaborates with Regeneron for COVID-19 Clinical Drug Trials

When COVID-19 first hit our shores with no vaccine nor proven drug treatment in sight, new innovative collaborations sprouted up across the nation, as leading research institutions, pharmaceutical companies and hospitals joined forces to find a solution fast. Among them—a collaborative clinical drug trial by NYMC and Regeneron Pharmaceuticals launched at Westchester Medical Center (WMC) within the first few weeks. Seeking a partner with whom to establish a clinical drug trial that could be used to treat critically ill patients with COVID-19, Regeneron proposed the collaboration—not only for NYMC’s state-of-the-art virology labs and internationally regarded experts—but because of the College’s decades-long involvement in the annual development of the influenza vaccine.



Salomon Amar, D.D.S., Ph.D.

“As a result of COVID-19, people from across all sectors are coming together to help drive efforts to find a treatment and stop the virus,” says Salomon Amar, D.D.S., Ph.D., vice president for research at NYMC and provost for biomedical research at Touro College and University System (TCUS). “In any situation, wherever there is darkness—any negative impact—there is always some light. For the COVID-19 crisis, this new collaborative spirit represents that light.” [Read full article on the clinical drug trials.](#)

Medical Student Part of Project to Test NYC Subways for COVID-19



Ebrahim Afshinnkoo, left

Rising fourth-year medical student **Ebrahim Afshinnkoo**’s passion for research has long been in evidence. So it came as no surprise that when the COVID-19 pandemic hit New York. Mr. Afshinnkoo rose to the occasion as part of a team to test New York City (NYC) hospitals and urban environments for the prevalence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and other viruses and to address the limitations in testing.

“It was an ‘all hands on deck’ situation in the lab, and I jumped at the opportunity to do my part,” says Mr. Afshinnkoo. “With clinical rotations suspended, I wasn’t able to help support our health care workers on the front lines, but I was able to help fight the pandemic through this research.”

It was during his undergraduate years at Macaulay Honors College at the City University of New York (CUNY) - Queens College that Mr. Afshinnkoo first began working with Christopher Mason, Ph.D., associate professor at Weill Cornell Medicine, on a project to collect DNA from the NYC subway system to study the urban microbiome and create a molecular portrait of NYC. That project later led him and Dr. Mason, in 2015, to co-found the MetaSUB (metagenomics of subways and urban biomes) International Consortium. Mr. Afshinnkoo currently serves as clinical director for MetaSUB.

“An event such as the COVID-19 pandemic was one of the reasons we founded the consortium, so that we could utilize next-generation sequencing technology to catalog and characterize urban microbiomes and aid public health officials and clinicians with surveillance and tracing,” says Mr. Afshinnkoo. “So when COVID-19 hit, we galvanized our resources to collect samples and try to adjust our protocols (which had been DNA-based sampling and analysis) to include RNA in order to detect SARS-CoV-2.”

[Read full article on Ebrahim Afshinnkoo’s work.](#)

NYMC Faculty Member Joins Team to Develop Alternate Form of Ventilation

For the past several weeks, **Albert Kwon, M.D.**, assistant professor of anesthesiology, has taken a step back from his critical role as an anesthesiologist at WMC to work on a critically important research project with equally lifesaving prospects.

As the acute need for ventilators amid the COVID-19 health crisis emerged and with the potential looming for a shortfall of thousands of units, a group of MIT engineers, teaming with doctors with clinical experience in treating respiratory conditions, looked to a ten-year-old design for an inexpensive alternative for ventilation as the possible solution. The alternate design sought to automate the standard manual process of squeezing by hand an emergency resuscitator bag (known as an Ambu bag), currently readily available in large numbers at hospitals.



Albert Kwon, M.D., center

Dr. Kwon, an MIT alumnus, first heard about the project during a call to a professional colleague on an unrelated matter and was quickly recruited to become part of team. Initially he was tasked with conducting an animal study to validate the functionalities of a ventilator. [Read full article on the project.](#)

GRANTS & DEPARTMENT RESEARCH

Nearly \$1 Million Grant to Again Support NYMC in Developing Flu Vaccine



Doris J. Bucher, Ph.D.

As the COVID-19 pandemic continues, researchers around the world are scrambling to develop a vaccine. More than a century ago, the 1918 influenza pandemic, which killed 50 to 100 million people worldwide, sparked similar vaccine-related research, and today, the Centers for Disease Control (CDC) estimates that the influenza vaccine reduces the risk of flu illness by between 40 percent and 60 percent.

NYMC has been at the forefront in aiding in the development of the annual influenza vaccine for decades. Each year, NYMC researchers develop two to four high-yield, high-growth influenza virus reassortants as ‘seed’ viruses for the production of the world’s annual supply of influenza vaccine—some 400 million doses worldwide.

This year, that research will be supported by a \$956,604 grant from the International Federation of Pharmaceutical Manufacturers and Associations (IFPMA). Since 2002, NYMC has annually received similar funding for influenza vaccine development from IFPMA and the Biomedical Advanced Research and Development Authority (BARDA), totaling approximately \$18 million to support this important research.

“Every year is critical, with the influenza vaccine preventing thousands of deaths and several hundred thousand hospitalizations,” says **Doris J. Bucher, Ph.D.**, associate professor of microbiology and immunology, who has overseen the laboratory and directed the production of the seed viruses at NYMC since 2004. “We also developed the seed viruses for the 2009 swine flu vaccine. Because our approach was more rapid than a competing methodology, it resulted in a better product, which was recognized by the vaccine manufacturers with increased funding.” [Read full article on influenza vaccine development.](#)

Grants Corner

Mitchell S. Cairo, M.D., professor of pediatrics, medicine, pathology, microbiology and immunology and cell biology and anatomy and co-chief of hematology, will serve as PI for a \$504,183 grant from Jazz Pharmaceuticals, Inc. for a “Pilot Study to Determine the Safety of Defibrotide in Children with High Risk Kawasaki Disease.”

Abhay Dhand, M.D., associate professor of medicine, has received a \$38,750 grant over the course of three years from Tetrphase Pharmaceuticals for “In-vitro Susceptibility of Eravacyline Against Multi-Drug Resistant Enterococci and Enterobacteriaceae.”

Xiang Dong, M.D., clinical associate professor of surgery, has been awarded a \$303,924 grant from The MT Group, Inc. for “Translational Medicine: Discovery and Evaluation of Biomarkers/Pharmacogenomics for the Diagnosis and Personalized Management of Patients.”

Allen J. Dozor, M.D., professor of pediatrics, has been awarded a \$21,205 grant by AstraZeneca Pharmaceuticals to conduct a “multicenter, double-blind, randomized, placebo-controlled, parallel group, Phase 3, safety extension study to evaluate the safety and tolerability of Tezepelumab in adults and adolescents with severe uncontrolled asthma.”

Marina Holz, Ph.D., dean of the Graduate School of Basic Medical Sciences and professor of cell biology and anatomy, has received a \$30,000 grant from the American Cancer Society to support “Tamoxifen Signaling in ER-negative Breast Cancer.”

Jeontaik J. Kwon, M.D., M.S.E., assistant professor of surgery, has been awarded a \$26,780 grant from Thomas Jefferson University in support of “Evaluation of a Closed Incision Negative Pressure Dressing (PREVENA) To Prevent Lower Extremity Amputation Wound Complications.”

Edmund F. Lagamma, M.D. '76, professor of pediatrics, biochemistry and molecular biology, has been awarded a \$24,020 grant from Aerogen Pharma for a study to “determine the efficacy, safety and tolerability of AeroFact™ (Aerosolized SF-RI 1) administered by nCPAP vs nCPAP alone in treatment of preterm infants at risk for worsening respiratory distress syndrome.”

Xiu-Min Li, M.D., M.S., professor of microbiology and immunology and otolaryngology, received a \$55,000 grant over the course of two years from the Moss Family Foundation for “Mechanisms Underlying the Effects of TCM Dietary Supplements on Improving Gastrointestinal Symptoms Related to Eosinophilic Esophagitis: Preclinical Study.”

Student Research Opportunities

While many NYMC faculty have had to suspend their research activities to prioritize patient care, those not on the front lines of the pandemic are able to dedicate more time to student mentoring. In addition, numerous COVID-19-related projects have emerged and welcome student involvement. These projects have been met with great enthusiasm as students from pre-clinical and clinical years have filled the available spots within days. To help manage the outpouring of student interest, student leadership positions have emerged to facilitate medical student contributions during this challenging time.

Bertie Zhang, a current third-year medical student, has been coordinating and recruiting for COVID-19 research projects based at NYC Health + Hospitals/Metropolitan. Through close collaboration with hospital administration, project leads and NYMC leadership, she has played a key role in connecting student researchers to multiple projects in the Department of Medicine and Department of Emergency Medicine. Current Metropolitan projects include an inpatient COVID-19 database, a disposition follow-up QI project and a multicenter COVID-19 study. A survey of all NYMC-affiliated faculty is underway to identify all such opportunities for student research. An updated list of available projects (COVID-19-related and non-related) for School of Medicine (SOM) students will be posted on LEO/LCMS+ under the SOM-Research heading. In addition, a link to the Google sheet will be sent directly to all students.

Dr. Jonathan Fisher Receives \$1.375 million Grant to Study Enhancing Sensory Acuity with Ultrasound

Jonathan Fisher, Ph.D., assistant professor of physiology, recently received a four-year \$1.375 million grant from the National Institutes of Health (NIH) to support his research on using ultrasound to enhance sensory acuity.

“The surface of our brain, the cerebral cortex, contains a ‘map’ of the senses. This map is ‘plastic,’ and can change depending on your experiences. When you practice the piano, for example, the regions on your brain that represent the fingers change. If a limb is amputated, the topology of the sensory map may change. Noninvasive, low-intensity focused ultrasound (FUS) can adjust this mapping—however nobody really knows how, why or how far we can take this technology,” says Dr. Fisher. “The applications range from therapy to science fiction.”

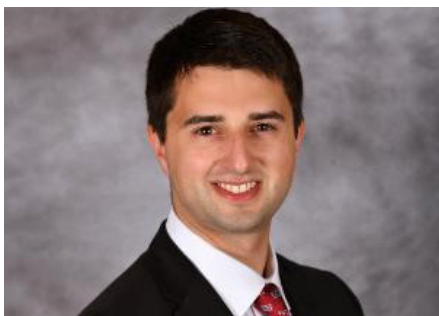


“Brain stimulation technology is actually a staple of neurotherapeutics. Transcranial magnetic stimulation, for example, is ubiquitous and has been used for everything from assessing brain injury to treating depression and eating disorders. Deep brain stimulation can be used to treat epilepsy or essential tremor. However, those technologies affect golf ball-sized volumes of the brain. Ultrasound can be focused into beams thinner than a grain of rice. Imagine how finely we could tune the treatment.”

According to Dr. Fisher, despite the allure of FUS as a modulation approach, many aspects of the technology relevant to translational capability are unclear, and conflicting results have been reported for even macroscopic effects. The federal funds, which will support the project, “Neural mechanisms of ultrasound-induced enhancement of sensory acuity,” will allow Dr. Fisher to characterize the transformation of targeted stimulation to behavioral changes.

“By leveraging novel optical tools and behavioral experimental approaches, the proposed research will address key knowledge gaps that currently limit development and refinement of FUS neuromodulation for use in humans.”

NYMC Recent Graduate’s Novel Research May Improve Ability to Predict Outcomes for Older Neurosurgery Patients



Having authored 18 peer-reviewed publications and having mentored as many as 15 junior medical students at a time, **Matthew McIntyre, M.D. '20**, who graduated in April, is poised to become a rising star in the field of neurosurgical research.

Inside the bustling hallways of NYMC, you may have found Matthew McIntyre helping a junior medical student to design a study or to review their data set. At first glance, it’s an ordinary tableau that can be found in almost any lab at a major health sciences college. However, upon closer inspection, what makes this scene extraordinary is that at the time, Dr. McIntyre was still just a medical student himself.

The team Dr. McIntyre is currently mentoring is looking at frailty—a state of reduced physiologic reserve—as a measure to predict outcomes in neurosurgical patients.

Though age and frailty are highly correlated, Dr. McIntyre explains that different studies have shown frailty to be independent of age. As a result, current prediction models are not comprehensive enough to give neurosurgeons a definite understanding of a patient’s anticipated outcome, but it is Dr. McIntyre’s goal to change that. [Read full article about Dr. McIntyre.](#)

Research Support Services Committee Update

The Research Support Services Committee (RSSC) is a standing committee of the NYMC faculty charged with ensuring that research services are providing appropriate support to the faculty. Historically, the committee has monitored administrative services, such as purchasing and research administration, and has worked with other committees essential to research activities to improve library and IT services and core facilities. The committee also provided key input to the Research Advancement Task Force, which was convened by Alan Kadish, M.D., president of NYMC and TCUS, in 2011 and developed a focused plan for increasing NYMC research and proposed improvements to research support processes, several of which have been implemented, including overhauling the purchasing system. The RSSC reports to the Executive Committee of the Faculty Senate and the NYMC SOM Dean.



At the January meeting, with support from the executive committee and SOM Dean Jerry Nadler, it was agreed to survey the faculty to better understand their current and future research needs. After collecting and reworking materials from several sources, including the prior Research Task Force survey, the RSSC implemented and launched a new survey on the Qualtrics platform with essential contributions from Lenore Carpinelli in the SOM dean's office.

The survey is now closed, and we thank the many faculty who took their valuable time to contribute. There were 120 responses from faculty in 21 of 27 basic science and clinical departments in the SOM, Graduate School of Basic Medical Sciences and School of Health Sciences and Practice. Survey results are being analyzed, but some preliminary notes of interest are:

- Useful suggestions to increase extramural funding successes
- Excellent rating for quality of Laboratory Animal Resources, which is the most-used core
- Good/Average rating for Core Histology Facility, which is second most-used
- Excellent/Good rating for q-PCR facility, which is third most-used
- High level of support for implementing automated monitoring of ultra-freezers, freezers, incubators, etc.
- ~75% of faculty would participate in an automated NYMC network data backup service

Once analyzed, the RSSC will use this information to further improve research operations by following up on issues raised, and by making recommendations to the executive committee and Dean Nadler. We will also share the data with other divisions as appropriate, with the anticipation these findings will be used for strategic planning.

Reporting for the RSSC, Christopher S. Leonard, Ph.D., chair

Research Information Updates/NIH Links

Bridge & Seed Funding Grant Programs: The deadline for submissions of proposals under the Bridge and Seed Funding Grant Programs has been extended until **May 15, 2020**. Special attention will be given to Seed Grant applications covering COVID-19. Program guidelines, instructions and application [forms are available here](#).

[Weekly NIH Announcements and NIH Funding Opportunities](#)

NYMC Office of Research Administration: [Learn more about funding opportunities here](#).

Research Gate: [Read about recent publications here](#).