IN JUNE, HAWAII BECAME THE FIRST STATE IN THE U.S. TO BAN CHLORPYRIFOS, THE MOST WIDELY USED PESTICIDE IN THE COUNTRY AND A NEUROTOXIN LINKED TO DEVELOPMENTAL DELAYS AMONG CHILDREN. In 2000, the federal government banned nearly all residential and indoor uses of the organophosphate. Its application in agricultural and industrial settings has remained a source of fierce debate; in 2017, then-Environmental Protection Agency head Scott Pruitt denied a petition to outlaw the compound, which has been registered for use in the United States since 1965.

Prior to a unanimous vote by Hawaii’s state legislature in favor of the bill in May, Virginia Rauh, ScD, professor of Population and Family Health and one of the nation’s leading chlorpyrifos researchers, traveled to Honolulu, where she met with Governor David Ige and state legislators to explain scientific analyses of the health risks of exposure during prenatal and early childhood development. Over the past 15 years, Rauh and collaborators at the Columbia Center for Children’s Environmental Health have studied the chemical, finding that the greater a person’s exposure during pregnancy, the lower her child’s IQ score. Another study documented exposure-related structural changes to children’s brains in areas governing attention, planning, and other executive functions. Ongoing research is investigating movement and motor symptoms that might relate to early Parkinson’s disease.

“I walked the legislators through what our research has found in the cohort of children here in New York City,” says Rauh. “We’ve studied chlorpyrifos before and after the residential ban in 2000, and the differences in exposure levels are stark. Given the ongoing agricultural applications in many parts of the country, children continue to be exposed to levels of chlorpyrifos that have been associated with a range of cognitive and motor deficits. Such risks are unacceptable and preventable with sound public health policy.”

HONOR ROLL

A SAMPLING OF AWARDS

- **John Santelli**, MD, MPH, professor of Population and Family Health, awarded $3.5 million by the NIH to investigate structural and social transitions among adolescents and young adults in Uganda.

- **ICAP**, awarded $25 million from the U.S. President’s Malaria Initiative.

- **Karolynn Siegel**, PhD, and **Eric Schrimshaw**, PhD, Sociomedical Sciences, awarded $2.5 million to study HIV risks.

- **Joseph Graziano**, PhD, and **Ana Navas-Acien**, MD, PhD, professors of Environmental Health Sciences, awarded $3.3 million by the NIH to investigate the health effects and geochemistry of arsenic.

A PLACE AT THE TABLE
STUDENTS TAP THEIR LEADERSHIP POTENTIAL

“If they don’t give you a seat at the table,” Shirley Chisholm, the first black woman elected to the U.S. Congress, once declared, “bring a folding chair.” This past winter, Columbia Mailman School students Misty Downey, MPH ’18, Caroline Johnson, MPH ’18, Audrey Nuamah, MPH ’18, and Chelsea Wynn, MPH ’18, took Chisholm’s injunction to heart, launching Columbia Emerging Women’s Leadership (CEWL).

Nearly 80 percent of employees who work in healthcare are women, but they comprise only 40 percent of key healthcare industry decision-makers. “Women face unique challenges related to health and success in the public health industry,” says Nuamah, “and these challenges are often compounded by intersectional factors such as race, sexual orientation, and religion, among others.”

The group’s first event, “What Do You Need to Lead?” served as a needs assessment; participants detailed their hopes for an organization dedicated to cultivating women as leaders.

The second event, “Workplace Bootcamp: A Mini-Series for Women to Start (and Stay) Strong On the Job,” addressed that feedback. Participating faculty provided guidance on developing an elevator pitch, navigating gender dynamics in the workplace, building interviewing skills, and handling workplace harassment.

“Learning from women who have come before us and supporting those who will come after is crucial,” says Nuamah. “In order to break the glass ceiling, we must use our collective strength. Until then, we will continue to bring our own folding chairs.”

A BOLD BEGINNING
IN PURSUIT OF EQUITY AND UNITY

AT THE 2018 COMMENCEMENT, 600 STUDENTS WERE AWARDED A MASTER’S DEGREES AND 40 RECEIVED THEIR DOCTORAL DEGREES. SETH BERKLEY, MD—CEO OF GAVI, THE VACCINE ALLIANCE, AND RECIPIENT OF THE DEAN’S VISIONARY LEADERSHIP AWARD—GAVE THE KEYNOTE ADDRESS. Since its inception in 2000, Gavi has supported the immunization of more than 640 million children in low-income countries and, as a result, prevented more than 9 million deaths. Essie Essamba Quakyi, MPH ’18, (Department of Sociomedical Sciences), was the student speaker chosen by a committee of students, faculty, and staff.

“Now we’re focused on the missing child,” said Berkley of his vision for Gavi to vaccinate another 300 million children by 2020. “We want to increase coverage and increase equity by finding the areas we haven’t been able to adequately reach, including some middle-income countries that are lagging behind.”

At the inaugural Students of Color Graduation Celebration, which honored the theme “unity across difference,” participants received kente cloth stoles. The first of its kind for a school of public health, the event was organized by the Black and Latinx Student Caucus and Advocates for Asian American Health, with help from the Office of Student Affairs and the Office of Diversity, Culture, and Inclusion. Then-New York City Health Commissioner Mary Bassett, MD, MPH, gave the keynote address. “You are so lucky to have family that extends beyond blood ties and extends to the solidarity of people with whom we share an identity, as people of African descent and people of color,” said Bassett, an adjunct professor in the Department of Epidemiology. “There may come a day when we don’t need this solidarity, but that time hasn’t come.”

HONOR ROLL

* Danting Liu, MPH ’18, named president of the Mailman School Graduate Student Association, reconstituted in 2018 with a five-member executive board, representatives from all six departments, and a doctoral council.
* Chelsea Samone Wynn, MPH ’18, winner of the Campbell Award for “exceptional leadership and Columbia Spirit” and Celia Anne Wright, MPH ’18, awarded the Bernard Challenor Spirit Prize for “building community, across department boundaries at the Mailman School.”
* Darby Jack, PhD, assistant professor of Environmental Health Sciences, awarded $2.5 million by the NIH to document children’s lung development following a cookstove intervention to reduce indoor air pollution.
* Wafaa El-Sadr, MD, MPH ’91, founding director of ICAP, recognized on CNN’s list of nine foreign-born Americans “who helped make America great,” for her work to provide women and their families with services to treat and prevent HIV/AIDS.
IN JANUARY, MUMBAI-BASED SCIENTIST YUSUF KHWAJA HAMIED, CHAIRMAN OF INDIAN GENERICS PHARMACEUTICAL GIANT CIPLA, PROVIDED THE FIRST INSTALLMENT OF A $1 MILLION GIFT TO ESTABLISH A FACULTY EXCHANGE PROGRAM TO ADVANCE SCIENCE AND IMPROVE PUBLIC HEALTH OUTCOMES IN INDIA. A champion of global access to affordable medications for HIV/AIDS, tuberculosis, asthma, and other ailments chiefly affecting developing countries, Hamied has provided for approximately 15 Columbia Mailman School faculty—selected by the dean of the school and the director of Columbia’s Global Center in Mumbai—to travel to India each year. Participants will pursue residencies of three to ten weeks, develop collaborative projects, and conduct research with faculty at Indian institutions. Collaborating Indian scientists will in turn take residencies at the Columbia Mailman School. The gift also provides for a lecture series and workshops, including an annual lecture in New York related to public health in India, as well as development of pedagogical resources, publications, webinars, podcasts, and outreach materials to disseminate research findings and public health data that emerge from the program.

IN SEPTEMBER 2017, THE CENTER FOR INFECTION AND IMMUNITY (CII) RECEIVED A FIVE-YEAR, $9.6 MILLION GRANT from the National Institutes of Health to create the Center for Solutions for Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (CfS for ME/CFS).

The CfS for ME/CFS is one of three inter-disciplinary, inter-institutional research groups—together with a data management and coordinating center—created to advance understanding of the disease in order to develop effective means to diagnose, treat, and prevent ME/CFS. As many as 2.5 million Americans have ME/CFS, a debilitating disease characterized by extreme fatigue after exertion that is not relieved by rest and other symptoms, including muscle and joint pain and cognitive dysfunction; there are no laboratory tests for diagnosis or specific treatments.

W. Ian Lipkin, MD, director of CII and John Snow Professor of Epidemiology, leads the CfS for ME/CFS, which will pursue basic research and develop tools to help physicians and individuals with ME/CFS monitor the course of illness. In laboratory studies, the investigators will analyze molecular footprints of potential bacterial, fungal, and viral triggers, together with corresponding immune responses, including autoantibodies. Other studies will analyze metabolites and gene expression in individuals with ME/CFS after physical activity and mine databases for insights into clinical features, comorbidities, and subtypes that could refine laboratory analyses and enhance their care. Scientists will also work with the ME/CFS community, including clinicians and people with ME/CFS, to design a mobile app called myME/CFS that will track symptom severity in tandem with stressors and interventions. Aggregated data from the app may yield insights into triggers that initiate or exacerbate disease, including links between infection and disease in a subset of patients. Overall, the CfS for ME/CFS studies may lead to the development of animal models of ME/CFS and/or clinical trials of antibiotics, pre- and probiotics, antifungals, antivirals, or immunomodulatory treatments.

"ONE OF OUR GOALS IS TO DISSOLVE BARRIERS AMONG SCIENTISTS, CLINICIANS, INDIVIDUALS WITH ME/CFS, AND ADVOCATES," says Dana March, assistant professor of Epidemiology and deputy director and administrator of CfS for ME/CFS. “By connecting with the global digital ME/CFS community, we aim to increase the visibility and reduce the stigma of what many have described as an invisible population."
WHEN IT COMES TO UNDERSTANDING HOW CHEMICAL POLLUTANTS AFFECT OUR HEALTH, GARY MILLER, PHD, TAKES A HOLISTIC APPROACH. INSTEAD OF EXAMINING ONE CHEMICAL AT A TIME, HE INVESTIGATES THEIR SYNERGY, STUDYING HOW COMBINED EXPOSURES ACROSS THE LIFESPAN—KNOWN AS THE EXPOSOME—RAISE THE RISK FOR DISEASE. A leading proponent of this wide-angle approach, Miller has orchestrated broad research collaborations across disciplines to make progress on diseases like Parkinson’s. As the Columbia Mailman School’s new vice dean for research strategy and innovation—and a faculty member in the Department of Environmental Health Sciences—he envisions a role as a “scientific matchmaker,” bringing together researchers from disparate areas to explore questions so complex they demand a multidisciplinary team’s expertise.

How do you explain the exposome? It’s the soup we live in. Every day, our bodies are exposed to complex mixtures of chemicals—pesticides, flame retardants, heavy metals, and so on. Traditionally, researchers have studied one chemical at a time, at high doses. Today, it’s possible to look at low levels of dozens, even hundreds, of chemicals to understand how they combine to affect our health in a way that is more true to life.

Who are your collaborators? In my own research into Parkinson’s disease, I’ve partnered with clinicians, surgeons, engineers, systems biologists, physicists, and biochemists. That’s just one disorder. Another project required that we demonstrate the utility of a microneedle–based collection system to sample biological fluids. The work required expertise in engineering, metabolomics, bioinformatics, and environmental health sciences.

Why cast your net so wide? Moving the needle on the most difficult, entrenched, and multifaceted public health challenges—whether Parkinson’s disease or obesity or climate change—demands a strong commitment to interdisciplinary research, both from investigators and the institution as a whole. When you are deliberate about building the right kinds of teams, you get the most creative and transformative results. The whole really is bigger than the sum of its parts.

What role does big data play? The old model was focused on the individual investigator. With the Human Genome Project, we saw the value of putting together bigger teams. Now there are large investments in precision medicine. Once we looked at health outcomes in 50 people; today, we’re looking to do it in a population of 100,000 or more. The only way to do this is by developing sophisticated teams of scientists with a variety of skills.

How does the institutional culture of the School measure up? I’ve been struck by the level of enthusiasm and willingness to try new things and be daring. There is a sense of urgency. People here want to do something important because there are so many important public health problems to solve. The energy here is a lot like a start-up, even though the School has been around for nearly a century.