

SUMMER/FALL 2023

# EINSTEIN

THE MAGAZINE FOR ALUMNI AND FRIENDS OF ALBERT EINSTEIN COLLEGE OF MEDICINE



## A PATH TO SUCCESS

The Einstein Enrichment Program prepares Bronx students  
for careers in medicine and science

# A Message From the Board Chair

I am enormously pleased that Einstein's Board of Trustees has appointed Yaron Tomer, M.D., as the College of Medicine's ninth dean. He has served with distinction for the past seven years as professor and chair of the department of medicine at Einstein and Montefiore, and assumed his new duties on Oct. 2.

Dr. Tomer, who was also the Anita and Jack Saltz Chair in Diabetes Research, has established an exceptional record as an outstanding visionary and inclusive leader. I am confident that he will lead Einstein into an even brighter and more successful future. You can learn more about Dr. Tomer on pages 2 and 3. I'd also like to express my gratitude to Harris Goldstein, M.D., senior associate dean for scientific affairs, who has served Einstein so capably as interim dean these past few months.

In more good news, I am delighted to report that our cancer center has been awarded "comprehensive" status by the National Cancer Institute (page 10). The newly renamed Montefiore Einstein Comprehensive Cancer Center began as the country's fourth NCI-designated cancer center—and has undergone a dramatic transformation and expansion since Edward Chu, M.D., M.M.S., became the director in 2020.

Additionally, this issue of Einstein magazine contains news about our biomedical investigations. Our story, "Cannabis: From Menace to Medicine," focuses on a group of Einstein and Montefiore researchers who are exploring medical marijuana's potential for treating various types of pain as well as autism spectrum disorders. The researchers are



also working to educate patients about the risks and benefits of medical cannabis and have established clinical guidelines for its use (page 26).

In our cover story, "A Path to Success," we catch up with five graduates of the Einstein Enrichment Program, which has been preparing Bronx students for careers in medicine and science for more than 30 years (page 20).

Finally, the magazine pays tribute to two members of the Einstein family whom we lost in recent months: long-time fellow trustee Arnold S. Penner and pioneering scientist Fernando Macian-Juan, M.D., Ph.D. (page 68). They and other members of the Einstein community listed in the "In Memoriam" section (page 67) will be greatly missed.

*Ruth L. Gottesman*

RUTH L. GOTTESMAN, ED.D.  
*Chair, Albert Einstein College of Medicine  
Board of Trustees  
Einstein Professor Emerita of Pediatrics*

## EINSTEIN

Science at the Heart of Medicine

Summer/Fall 2023

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# IN THIS ISSUE

## COVER STORY

### 20 A PATH TO SUCCESS

The Einstein Enrichment Program prepares Bronx high school students for careers in medicine and science

## FEATURES

### 26 CANNABIS: FROM MENACE TO MEDICINE

Einstein and Montefiore researchers are investigating its potential for treating pain, autism spectrum disorders, and more

### 38 CELEBRATING A SCIENTIFIC LIFE

Renowned molecular and developmental biologist Lucy Shapiro, Ph.D. '66, is still making groundbreaking discoveries

### 44 FIRE IN THE BRAIN

Einstein scientists are working to quench the inflammation behind obesity, type 2 diabetes, depression, and other diseases

### 56 WOMEN FUNDING SCIENCE

The Spirit of Achievement Luncheon breaks records for supporting research at Einstein

### 60 BRIDGING A GAP IN HEALTHCARE

Montefiore's new Community Health Worker Institute is training Bronx residents to help patients find vital resources



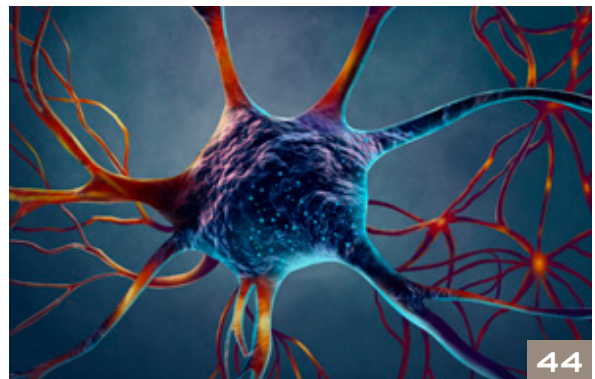
20



26

## DEPARTMENTS

- 2 Campus News
- 10 Research Notes
- 14 Lab Chat: Frank Soldner, M.D.
- 18 Mavens of Medicine: David Loeb, M.D., Ph.D.
- 52 Passionate Pursuits: Damien Jackson, M.Ed.
- 54 Crossword: Albert's Puzzler
- 55 Motivations: The Front Line of Philanthropy
- 64 Class Notes
- 69 A Look Back



44

**ON THE COVER:** Bronx high school students enrolled in the Einstein Enrichment Program participate in life-support training in July in the Montefiore Einstein Center for Innovation in Simulation. Photo by Jörg Meyer.



Visit [magazine.einsteinmed.edu](https://magazine.einsteinmed.edu) or hover your smartphone camera over this code.

## Yaron Tomer, M.D., to Lead Einstein as New Dean

**Y**aron Tomer, M.D., has been named the Marilyn and Stanley M. Katz Dean at Einstein and assumed his new role on Oct. 2. As dean, Dr. Tomer will lead more than 1,900 full-time faculty, further advancing Einstein's mission of state-of-the-art research, education, diversity, community engagement, and philanthropy. Under Dr. Tomer's guidance Einstein will continue its national leadership in biomedical research while offering one of the nation's largest programs for medical education.

"Dr. Tomer stood out for his deep background in basic-science research, bench-to-bedside care, and commitment to Einstein's mission to prepare a diverse body of students to become knowledgeable and compassionate physicians and innovative scientific investigators," says Philip O. Ozuah, M.D., Ph.D., president and chief executive officer, Montefiore Medicine. "He comes to this position at a critical time, as the next generation of physicians and scientists will face an ever-changing and challenging landscape. His leadership will foster an environment that will prepare students and faculty to make lasting contributions to science."

### EMPHASIS ON INNOVATION

Prior to his appointment, Dr. Tomer served as chair of the department of medicine at Einstein and Montefiore and was the Anita and Jack Saltz Professor in Diabetes Research. As department chair, he led more than 700 full-time faculty members.

His lifelong emphasis on innovation yielded significant growth in the department's research with the recruitment of



new faculty and an increase in National Institutes of Health (NIH) funding to \$66 million in 2022 (ranked no. 27 by the Blue Ridge Institute for Medical Research, an independent nonprofit that publishes its annual list based on NIH support).

Dr. Tomer is especially committed to fostering the careers of junior faculty; currently, the department of medicine has 18 NIH grants for early-career scientists (also known as K-series awards).

Dr. Tomer also launched the department of medicine's strategic plan for diversity, equity, and inclusion (DEI), recruiting an inaugural associate chair for DEI to oversee its implementation. During the COVID-19 pandemic Dr. Tomer successfully led the department's response to the unprecedented crisis.

Upon accepting the position as dean, Dr. Tomer said, "I am honored and humbled by the confidence the Board has expressed in my leadership. Over



the course of my tenure at Einstein, I've had the opportunity to see, firsthand, the impact our students and faculty have had in transforming communities and advancing science. I am fully committed to building a more diverse physician workforce that reflects the fabric of our society, and to our shared cause of social medicine and social justice."

### **WORLD-RENOWNED RESEARCHER**

Before joining Montefiore Einstein as chair of medicine in 2016, Dr. Tomer served as vice chair for research, division chief of endocrinology, and the Lillian and Henry M. Stratton Professor of Molecular Medicine, all at the Icahn School of Medicine at Mount Sinai in New York.

"Dr. Tomer's life's work and his international reputation will strengthen Einstein's place as a destination for the world's brightest faculty and students," says Ruth L. Gottesman, Ed.D., chair of Einstein's Board of Trustees. "The Board is honored that Dr. Tomer has chosen to continue his work with Montefiore Einstein by leading our great medical school."

Dr. Tomer is a world-renowned researcher with a robust, NIH-funded laboratory. He is the recipient of several awards recognizing his research accomplishments, including the prestigious 2023 Sidney H. Ingbar award from the American Thyroid Association.

Born and raised in Israel, Dr. Tomer graduated magna cum laude from the Sackler School of Medicine in Tel Aviv. He trained in medicine and endocrinology at the Icahn School of Medicine at Mount Sinai.



Yaron Tomer, M.D., speaks at an Einstein "Women in Research" celebration in New York City in September. With him, at top, are Einstein professors Amit Verma, M.B.B.S., and Ana Maria Cuervo, M.D., Ph.D.

**"Dr. Tomer stood out for his deep background in basic-science research, bench-to-bedside care, and commitment to Einstein's mission."**

— PHILIP O. OZUAH, M.D., PH.D.,  
PRESIDENT AND CEO,  
MONTEFIORE MEDICINE

## Dean Tomer Announces Major Appointments



**Jennifer Garner, M.S.W.**, has been named senior associate dean for operations and finance at Einstein.

Most recently she was the unified administrator and senior director in the department of medicine at Einstein and Montefiore. “Ms. Garner brings 23 years of experience in finance and operations and a record of successful strategic planning to this role,” says Yaron Tomer, M.D., the Marilyn and Stanley M. Katz Dean at Einstein. “She will help establish and assess priorities involving the College of Medicine’s overall operations and budgetary resources to ensure that

planning, action, and measures of success are aligned to advance Einstein’s mission.”

Ms. Garner has overseen the financial and operational integrity of the department of medicine’s \$84 million clinical budget and \$66 million research budget. She worked closely with Dr. Tomer in spearheading strategic planning efforts and in implementing innovative programs that led to substantial annual increases in both departmental revenue and provider clinical productivity.

Ms. Garner’s prior roles include administrator of the division of endocrinology, diabetes, and bone disease at Mount Sinai Health System and operations director at the Hospital Medicine Group in Baton Rouge, La.



**Elizabeth Kitsis, M.D., MBE**, a rheumatologist, professor of medicine, and vice chair for faculty affairs in the

department of medicine at Einstein and Montefiore, has been appointed inaugural senior associate dean for faculty affairs and strategic planning.

“In her new role, Dr. Kitsis will support Einstein’s diverse faculty in all aspects of professional development and well-being, including oversight of faculty appointments and promotions, annual evaluations, and faculty mentoring,” said Yaron Tomer, M.D., the Marilyn and Stanley M. Katz Dean

at Einstein. “Importantly, she will lead our strategic planning process to ensure the College of Medicine continues its mission of excellence.”

Previously, Dr. Kitsis oversaw the appointment, promotion, and credentialing of more than 700 faculty. She led the development of the department of medicine’s strategic plan, and led the creation of its Physician Awards program, Faculty Scholars program, professional development reviews, well-being initiative, and GRANDMED speaker program.

Dr. Kitsis joined Montefiore Einstein in 2008 as director of bioethics education. She was appointed associate chair for faculty affairs in the department of medicine in 2014 and was promoted to vice chair in 2016.

## Dr. Pandit Named Assistant Dean for Faculty Development



**Kiran Pandit, M.D., M.P.H.**, in June was named the assistant dean for faculty development and educational

assessment, part of the office of medical education at Einstein.

Dr. Pandit, who is also an assistant professor of emergency medicine, comes to Einstein from Columbia University, where she received her medical and public health degrees and completed her residency in emergency medicine before joining its faculty.

At Columbia she led a departmental effort to revamp and improve the teaching assessment process for emergency medicine faculty and served on several M.D. curriculum committees, including the course evaluation subcommittee and the curriculum revision committee.

Dr. Pandit says her vision for the new position is to “strengthen the community of faculty at Einstein and Montefiore by supporting their development as educators, researchers, and scholars. I want to help them reach their goals of teaching and training a variety of learners, discovering and disseminating knowledge, and leading others locally, nationally, and globally.”

She added, “Our faculty are our institution’s greatest asset, and we aim to support them as they constantly strive to grow, reach new heights, and impact the world in greater ways.”





Amy Ehrlich, M.D., talks to a patient in a Montefiore clinic.

## New Chief of Geriatrics Named

**A**my Ehrlich, M.D., was appointed in September as the new chief of the division of geriatrics in the department of medicine at Einstein and Montefiore. Dr. Ehrlich, a professor of medicine at Einstein, has served as associate chief of geriatrics at Einstein and Montefiore as well as medical director of Montefiore Home Care for the past 10 years.

Her research interests include screening for mild cognitive impairment and dementia in ethnically and racially diverse primary-care settings and the prevention of burns and fires in older adults’

homes. In her role as medical director of Montefiore Home Care, she worked with the interdisciplinary team to develop disease-specific programs that help address challenges in transitions of care.

Dr. Ehrlich received her medical degree from Harvard Medical School and trained in internal medicine at Beth Israel Hospital. She started her career at the East Boston Neighborhood Health Center and in 1993 joined the faculty in geriatrics at Montefiore. She has held various leadership roles, including medical director of the geriatrics ambulatory practice and director of the geriatrics fellowship program.

## Gerontological Society Recognizes Dr. Verghese



The Gerontological Society of America (GSA) in June selected **Joe Verghese, M.B.B.S., M.S.**, director of the Einstein Montefiore Center

for the Aging Brain, for its 2023 Joseph T. Freeman Award, which acknowledges a prominent clinician in the field of aging in both research and practice.

GSA is the largest interdisciplinary

organization in the United States devoted to the field of aging. The recipients’ achievements serve as milestones in the history and development of gerontology.

Dr. Verghese is chief of the integrated divisions of cognitive and motor aging at Einstein and Montefiore. He also is the Murray D. Gross Memorial Faculty Scholar in Gerontology, the director of the Resnick Gerontology Center, and a professor in the Saul R. Korey Department of Neurology and of medicine at Einstein.

## Leukemia & Lymphoma Society Honors Dr. Will



The Leukemia & Lymphoma Society (LLS) in July selected **Britta Will, Ph.D.**, co-leader of the National Cancer

Institute–designated Montefiore Einstein Comprehensive Cancer Center’s Stem Cell & Cancer Biology Research Program, as the recipient of its prestigious Scholar Award.

The honor includes a stipend of \$120,000 for each of five years and is given to support talented tenure-track junior faculty who have established themselves as blood cancer researchers and are on a trajectory of leadership in the field.

LLS is the largest voluntary health organization dedicated to fighting blood cancers worldwide and funds innovative research as well as a substantial career development program that aims to accelerate the professional advancement of rising stars in the research community.

Dr. Will, associate professor of oncology, of medicine, and of cell biology at Einstein, investigates hematopoietic stem cells and their role in driving two age-related and largely incurable blood cancers: acute myeloid leukemia and myelodysplastic syndromes.

In 2020 she was awarded the prestigious Pershing Square Sohn Prize for Young Investigators in Cancer Research.

## Neuroscientist Receives McKnight Scholar Award



**Peri T. Kurshan, Ph.D.**, assistant professor in the Dominick P. Purpura Department of Neuroscience and in the department

of genetics at Einstein, in June received a 2023 McKnight Scholar Award from the McKnight Endowment Fund for Neuroscience.

This prestigious and competitive award—only 10 were given nationwide this year, across the many subdisciplines within the field—recognizes young investigators' promising work in neuro-

science. Since the award was introduced in 1977, it has funded more than 260 innovative investigators and spurred hundreds of breakthrough discoveries.

Dr. Kurshan investigates how synapses—the connections between neurons—are assembled and how defects in their assembly can lead to neurodevelopmental problems such as autism spectrum disorders. The McKnight award will support Dr. Kurshan's research aimed at unraveling the mechanisms of synapse development, from molecules to behavior.

McKnight Scholar Award recipients receive \$75,000 per year for three years.

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## Einstein Holds First RNA Biology Symposium

**D**ozens of scientists from across New York City converged upon the Michael F. Price Center/Block Research Pavilion in June to attend the inaugural RNA Symposium hosted by Einstein's RNA Club.

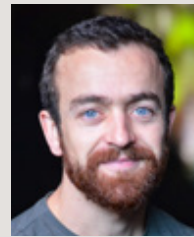
The daylong event featured lectures, discussions, and a poster session highlighting different aspects of RNA research. James Manley, Ph.D., the Julian Clarence Levi Professor of Life Sciences at Columbia University, delivered the keynote address to students, postdoctoral researchers, and faculty members.

Einstein's RNA Club was found-

ed in November 2022, when Robert Singer, Ph.D., professor of cell biology, professor in the Dominick P. Purpura Department of Neuroscience, and director of Einstein's Program in RNA Biology, teamed with Sulagna Das, Ph.D., Einstein research assistant professor of cell biology, and Einstein postdoctoral fellows Weihai Li, Ph.D., and Dong-Woo Hwang, Ph.D., to establish the group.

Their objective was to offer fellow College of Medicine researchers and others working with RNA a platform for discussing RNA biology.

## Researcher Named Leon Levy Scholar



**Geoffrey Terral, Ph.D.**, a postdoctoral researcher in the lab of Renata Batista-Brito, Ph.D., in the

Dominick P. Purpura Department of Neuroscience at Einstein, in June was named one of 10 recipients of the newly reinstituted Leon Levy Scholars in Neuroscience program at the New York Academy of Sciences and the Leon Levy Foundation.

The postdoctoral program supports exceptional young researchers across New York City as they pursue investigations in neuroscience and advance in their careers toward becoming independent principal investigators. The program aims to broaden the neuroscience field while helping promising researchers who might otherwise not have equal opportunity to secure funding. Each of the selected scholars will receive support over a three-year term.

The scholars program features structured mentorship by distinguished senior scientists. Workshops are designed to help scholars with grant writing, as well as developing leadership, communications, and management skills.

Dr. Terral was recognized for his examination of the morphology and connectivity of inhibitory neurons and their functional ability to generate brain waves.



# Einstein Hosts Inaugural Diversity Week

To recognize the importance of diversity in science and medicine, Einstein's office of diversity and inclusion hosted its inaugural Diversity Week in April as part of National Minority Health Month.

National leaders in science and medicine, including three Einstein alumni, gave daily lectures related to diversity, equity, and inclusion in academic medicine. Talks included such topics as "Advancing Diversity, Equity, and Inclusion in Obstetrics and Gynecology," "The Impact of a Key Social Determinant on My Career as a Thoracic Surgeon," and "Advancing Equity in Clinical Care."

Lynne Holden, M.D., senior associate dean for diversity and inclusion at Einstein, said Diversity Week was "an opportunity to bring to campus, in person or virtually, leading physicians, scientists, and thought leaders who



Einstein medical student Isaac Faith takes part in a question-and-answer session.

could share their insights and perspectives with our community members." Dr. Holden is also a professor of emergency medicine at Einstein and an emergency medicine physician at Montefiore.

Camille Clare, M.D. '97, professor and chair of obstetrics and gynecology

at Downstate Health Sciences University, kicked off the week's events with the ninth annual Roger Duvivier lecture. Other alumni lecturers included Raja Flores, M.D. '92, system chair, department of thoracic surgery, and professor of cardiothoracic surgery at the Icahn School of Medicine at Mount Sinai, and Yvette Calderon, M.D. '90, chair and professor of emergency medicine at Mount Sinai Beth Israel and dean/vice president for equity in clinical care at Mount Sinai.

National Minority Health Month is dedicated to raising awareness about the disproportionate burden of disease on racial and ethnic minorities and to promoting community education to reduce health differences.



## WATCH THE VIDEO

The ninth annual Duvivier Lecture kicked off Diversity Week: [magazine.einsteinmed.edu/diversity23](https://magazine.einsteinmed.edu/diversity23)

# Pathway Program Awarded Pinkerton Grant

BEYOND ALBERT, a new summer high school program at Montefiore Einstein Comprehensive Cancer Center (MECCC), has received a \$75,000 grant from the Pinkerton Foundation.

The funding supports student stipends, food, and transportation as well as two field trips, an end-of-summer symposium, and career and professional development programming. The grant also permits the program to take part in the New York City Research Mentoring Consortium,

comprising 20 partner programs across New York City. These include the Bronx Zoo and academic institutions such as the Rockefeller University, the Icahn School of Medicine at Mount Sinai, the NYU Tandon School of Engineering, and various scientific institutions and programs.

The BEYOND ALBERT (Bronx Einstein Youth Oncology Network Dedicated to Academic Learning, Biomedical Education and Research Training) High School Research Program supports students in the Bronx

in a two-part educational research experience during the summer and after school. Students can work in the labs of MECCC faculty members and learn scientific research skills.

The Pinkerton Foundation is an independent organization that supports community-based programs for youth in New York City.



## WATCH THE VIDEO

Learn more about BEYOND ALBERT: [magazine.einsteinmed.edu/beyond23](https://magazine.einsteinmed.edu/beyond23)

## CAMPUS NEWS

# Investing in Einstein: \$100 Million Gift to Advance Education and Research



The largest outright gift in Einstein's history, an anonymous \$100 million contribution to the College of Medicine for basic, translational, and clinical biomedical investigations and education programs, was announced in January 2023 by Philip O. Ozuah, M.D., Ph.D., president and chief executive officer of Montefiore Medicine. The transformational contribution will expand Einstein's research capabilities and provide direct financial support to students and enhance their learning facilities.

"Such a momentous investment is a testament not only to the donor's generosity and dedication to advancing medical education and research, but also to their confidence in Einstein's future success and growth," says Dr. Ozuah. "This inspirational gift will also help us further our commitment to excellence in biomedical research and medical and graduate education and training, and ultimately advance human health in the Bronx, our nation, and the world."

The historic gift will establish new

programs and initiatives, says Yaron Tomer, M.D., the Marilyn and Stanley M. Katz Dean at Einstein. It will "ensure our position as a biomedical and educational powerhouse, generating scientific discoveries and translating research breakthroughs into treatments. In addition, it will have a ripple effect of inspiring other donors to come forward and support Einstein's research and educational missions," he adds.

The new programs and initiatives are detailed below.



### MEDICAL EDUCATION

#### **Anatomy Lab.** Cur-

rently housed on the sixth floor of the Forchheimer Building, the anatomy lab plays a key role in medical education, providing students with a hands-on understanding of the human body. The anonymous gift will equip Einstein students with the most up-to-date technology in a renovated 17,000-square-foot space in the Van Etten Building, which will also house a new functional anatomy and surgical skills center. The vacated Forchheimer

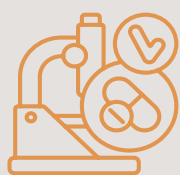
space will be converted into 3,500 square feet of research labs for investigators.

"With the new anatomy lab joining our Clinical Skills Center in the Van Etten Building, the site will become the hub for hands-on training and evaluation for our medical students," says Joshua Nosanchuk, M.D., senior associate dean for medical education at Einstein, "and will enrich the students' educational experience with state-of-the art facilities."

#### **Medical Student Scholarships.**

One of Einstein's priorities is to support highly qualified students who are least able to afford tuition at the College of Medicine. The anonymous donor has committed \$15 million for need-based scholarships for medical students. (See "\$15M Gift," Winter/Spring 2023 issue.) The donation consists of two parts: a \$10 million outright gift for student support, plus another \$5 million endowment to match other scholarship donations ranging from \$50,000 to \$250,000. Since the announcement, the matching gift offer has inspired \$3 million in further donations, primarily from alumni.





## BIOMEDICAL RESEARCH & TRAINING

### Scientist Recruitment.

- *Early-Career Investigators.*

World-class investigation is the engine that drives Einstein's biomedical research enterprise. In recent years, the College of Medicine has been enriched by the influx of new cancer-focused investigators associated with the National Cancer Institute-designated Montefiore Einstein Comprehensive Cancer Center. The anonymous gift will expand Einstein's enrichment efforts by helping to recruit multiple early-stage faculty members focused on other research areas, such as neuroscience, aging and metabolism, and immunology/infectious diseases.

- *Stem Cell Institute Director.* Long a home to basic and translational scientists who collaborate with their colleagues around campus, Einstein's Ruth L. and David S. Gottesman Institute for Stem Cell Biology and Regenerative Medicine is a key driver of research advances in cancer, diabetes, and neurological and cardiac development. The gift will support the recruitment of a new director for the center to build upon the

accomplishments of its inaugural director, Paul Frenette, M.D., who passed away two years ago.

- *Graduate Student Funding.* Einstein's graduate division provides exceptional education and training to more than 200 Ph.D. candidates who drive research at the College of Medicine. While at Einstein, graduate students mature as scientists under the guidance of their mentors and become prepared for their careers in science and industry.

The gift will provide generous support to enable the enrollment of several new Ph.D. students each year, covering tuition and a stipend for their first year on campus before they commit to specific labs. The funding will also provide supplemental support for labs lacking resources for graduate students.

- *Innovation Funds.* While the National Institutes of Health (NIH) finances the vast majority of research projects conducted at Einstein, the NIH is disinclined to fund high-risk/high-reward research. Philanthropy plays a critical role in filling this gap. The gift will supply funds for investigators launching new research projects and advancing promising findings from the lab to the clinic.

- *Seed Funding.* NIH funding usually requires investigators to generate preliminary data to demonstrate the feasibility of their proposed projects. This requirement can stand in the way of advancing promising research. The gift will provide seed funding for early- and mid-career investigators who are establishing or expanding their labs, allowing them to generate the initial data needed to secure NIH grants.

- *Acceleration Fund.* Translating a finding in the lab into a treatment requires funding to bridge the phase between discovery and translation into therapies. The new acceleration fund will provide resources to drive innovation forward, allowing researchers to better demonstrate the value of their findings to possible investors and life-science companies that can move treatments into clinical trials.

- *Shared Facilities.* Crucial support for Einstein's investigational enterprise is provided by more than 40 college-sponsored research facilities offering a wide range of cutting-edge analytic, engineering, and production services focused on work with proteins, genes, cells, and tissues. The gift will finance the purchase of state-of-the-art instruments and equipment, to provide our researchers with the newest technologies.

"Our researchers cannot make scientific breakthroughs without access to the most up-to-date equipment supported by highly trained staff in our shared facilities," says Harris Goldstein, M.D., senior associate dean for scientific affairs. "This gift is critical to ensure that our researchers can pursue the most-creative and technologically advanced research and that we recruit the finest faculty, postdocs, and students and secure highly competitive NIH grants."

# RESEARCH NOTES

## Cancer Center Awarded Comprehensive Designation

**M**ontefiore Einstein Comprehensive Cancer Center (MECCC) has been awarded “Comprehensive” designation by the National Cancer Institute (NCI); it’s the ultimate standard, achieved by only 55 other NCI cancer centers in the United States.

With its five-year, \$20 million Cancer Center Support Grant, MECCC will help advance the translation of novel cancer research into new treatments, new screening and diagnostic tools, and equitable access to care throughout the Bronx, Westchester County, and the lower Hudson Valley.

### SCIENCE + PATIENT CARE

“We are deeply honored to be recognized for the unique and special contributions of our cancer center,” says Edward Chu, M.D., M.M.S., director of MECCC, the Carol and Roger Einiger Professor of Cancer Medicine, and professor of oncology, of medicine, and of molecular pharmacology at Einstein, and vice president of cancer medicine at Montefiore. “This NCI designation is a testament to the remarkable strength of our exceptional science integrated with extraordinary multidisciplinary patient care.”

“We are proud of the entire team at the cancer center,” says Philip O. Ozuah, M.D., Ph.D., president and chief executive officer of Montefiore. “Our ongoing strategic investments and transformative institutional support ensure that Montefiore Einstein will continue to redefine



medical excellence and be at the forefront of discoveries and treatments that serve our patients with cancer and our community as a whole.”

### A NATIONAL MODEL

From genetic variants to systemic inequities, MECCC investigators strive to uncover the drivers of cancer disparities and develop interventions that result in better outcomes. Strong partnerships with community-based organizations bolster cancer screenings and other preventive measures specific to the needs and concerns of the Bronx community. Attention to social determinants of health, such as

diet and exercise, inform and enhance patient care and support services.

“We are a national model for community outreach, engagement, and cancer health equity,” says Dr. Chu. “It is critical that we do everything within our power to ensure that all patients receive the highest quality care.”

MECCC educates and trains the next generation of cancer investigators and physician-scientists through pathway programs that begin as early as high school. Initiatives such as BEYOND ALBERT, a summer science program for Bronx high school students, and the Einstein Discover Research Program, a training program for master’s degree candidates at the City University of New York’s Lehman College, offer opportunities for individuals from groups historically underrepresented in medicine and science.







Marla Keller, M.D., left,  
and Mimi Kim, Sc.D.

## Clinical and Translational Research Institute Awarded \$35M

**T**he Harold and Muriel Block Institute for Clinical and Translational Research at Einstein and Montefiore (ICTR) has received a seven-year, \$30 million grant from the National Institutes of Health (NIH).

The new award will ensure that the ICTR will further its vision to improve health in the Bronx, Westchester County, and the lower Hudson Valley by accelerating the translation of scientific discoveries into effective and equitable prevention and treatment approaches. Two additional grants from the NIH totaling \$5 million will support the ICTR's graduate and early-career-development programs.

"Since establishing the ICTR in

2007, our goal has been to reduce barriers that researchers face in making new discoveries and to speed up the rate at which scientific findings are incorporated into clinical practice," says Marla Keller, M.D., co-principal investigator on the primary grant, director of the ICTR, and professor and vice chair of medicine at Einstein and Montefiore. "And while we have always prioritized addressing health disparities, we are launching new resources to catalyze and support research that will significantly advance health equity."

The award will focus on advancing translational science, a new field of investigation dedicated to enhancing the efficiency and effectiveness of all

translational research. "We will introduce innovations in critical areas, such as community engagement, health informatics, and data science, that will facilitate research across a range of diseases and conditions," says Mimi Kim, Sc.D., co-principal investigator on the primary grant, associate director of the ICTR, and professor and head of the division of biostatistics in the department of epidemiology & population health at Einstein and Montefiore.

The ICTR's education and training grants will support both the Ph.D. in clinical investigation, which is embedded in Einstein's biomedical graduate program, and a career-development program for junior faculty that links with the ICTR's master of science in clinical research methods program, which has been instrumental in building the physician-scientist workforce at Einstein and Montefiore. The ICTR will diversify the research workforce by increasing the number of trainees from groups historically underrepresented in medicine and prioritizing representation of nurses and Ph.D. scientists in its training programs.

"At the core of Einstein and Montefiore has always been a commitment to equitable access to healthcare, education, and research for all people in our communities," says Paul Marantz, M.D., M.P.H., co-principal investigator on the education and training grants, associate director of the ICTR, associate dean for clinical research education, and professor of epidemiology & population health at Einstein.

In addition to Dr. Marantz, Michal L. Melamed, M.D., and Dean Hosgood, Ph.D., are co-principal investigators on the career development grant and the graduate program grant, respectively.



## Solved: The Brain's Strategy for Making Long-Lasting Memories

Helping your mother make pancakes when you were 3 years old ... riding your bike without training wheels ... your first kiss: how do we retain vivid memories of long-ago events? As described in a paper published in April 2023 in *Neuron*, Einstein researchers have found the explanation.

"The ability to learn new information and store it for long periods is one of the brain's most remarkable features," says Robert H. Singer, Ph.D., who is co-corresponding author of the paper. "We've made a startling discovery in mice regarding the molecular basis for making those long-term memories." Dr. Singer is a professor of cell biology and in the Dominick P. Purpura Department of Neuroscience and the director of the Program in RNA Biology at Einstein.

Some aspects of the cellular basis of memory were already known. Memories are made by neurons (nerve cells) and stored in a brain region called the hippocampus. They form when repeated neural

stimulation strengthens synapses—the connections between nerve cells. Proteins are needed to stabilize the long-lasting synaptic connections required for long-term memories. The blueprints for those proteins are molecules of messenger RNA (mRNA) that, in turn, are transcribed (copied) from memory-associated genes.

"The paradox is that it takes a long time—several hours—to form a lasting memory, yet the mRNAs and proteins associated with making proteins disappear in less than an hour," says Sulagna Das, Ph.D., first and co-corresponding author of the paper and research assistant professor of cell biology at Einstein. "How could that be?"

### SYNAPSE HOT SPOTS

To answer that question, the research team developed a mouse model in which it fluorescently tagged all the molecules of mRNA that flow from *Arc*, a gene critically important for converting our activities and other experiences into

long-term memories. The researchers stimulated synapses in neurons from the mouse hippocampus and then—using high-resolution imaging techniques they'd developed—observed the results in individual nerve cells in real time.

To their amazement, they saw that a single stimulus to the neuron triggered numerous cycles in which the memory-coding gene *Arc* produced mRNA molecules that were then translated into synapse-strengthening *Arc* proteins.

"We saw that some of the protein molecules made from that initial synaptic stimulus go back to *Arc* and reactivate it, initiating another cycle of mRNA formation and protein production, followed by several others," says Dr. Singer.

Adds Dr. Das: "With each cycle, we saw more and more protein accumulating to form 'hot spots' at the synapse, which are where memories are cemented into place. We'd discovered a previously unknown feedback loop that explained how short-lived mRNAs and proteins can create long-lived memories."

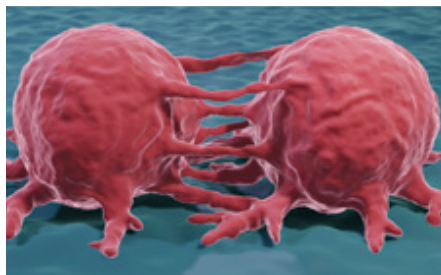
### INSIGHT INTO NEUROLOGICAL DISORDERS

Consider what's involved in memorizing a poem, suggests Dr. Singer: "To make a lasting memory requires that you read the poem repeatedly, and each reading can be thought of as an intermittent stimulus that adds memory-building protein to the synapse." Dr. Das notes that faulty expression of the *Arc* gene has been implicated in memory difficulties in humans and is linked to neurological disorders, including autism spectrum disorder and Alzheimer's disease. Additional authors include Pablo Castillo, M.D., Ph.D., and Pablo Lituma, Ph.D. (formerly at Einstein), of Weill Cornell Medical College.

# How an Anti-Metastasis Drug Combo Works

**M**etastasis—the leading cause of cancer death—occurs when so-called disseminated cancer cells (DCCs) escape from primary tumors and travel through the bloodstream to other organs, where they reactivate.

In 2015, Julio Aguirre-Ghiso, Ph.D., and colleagues published evidence indicating that the combination of two U.S. Food and Drug Administration–approved drugs—5-azacytidine (AZA) and retinoic acid (atRA)—can restore gene programs that suppress the growth of malignant cancer cells. Those results led the V Foundation for Cancer Research to fund a clinical trial to evaluate whether the drug combination can prevent or delay metastasis progression in prostate cancer patients; Dr.



Aguirre-Ghiso was the principal investigator on the V Foundation grant, which also explored how AZA and atRA could block metastasis.

In a paper published online in June 2023 in *Cell Reports*, Dr. Aguirre-Ghiso's team found that the drug combination suppresses metastasis in oral carcinoma animal models. DCCs that become metastatic were found to deactivate TGF- $\beta$ /SMAD4 signaling, which maintains DCCs in a dormant state; combining

AZA with atRA epigenetically reprogrammed the DCCs, restoring TGF- $\beta$ /SMAD4 signaling and preventing DCCs from reactivating. By inducing DCC dormancy, the AZA and atRA combination may represent a new therapy for preventing or delaying metastatic disease.

Dr. Aguirre-Ghiso is the Rose C. Falkenstein Chair in Cancer Research, a professor of cell biology, of oncology, and of medicine, the co-director of the Gruss Lipper Biophotonics Center at Einstein, the co-leader of the Tumor Microenvironment & Metastasis program at the National Cancer Institute–designated Montefiore Einstein Comprehensive Cancer Center, and the director of its Cancer Dormancy and Tumor Microenvironment Institute.

# A Simple Treatment for a Severe Skin Problem

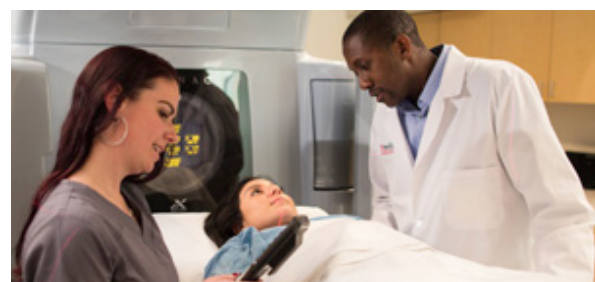
**R**esearchers at the National Cancer Institute–designated Montefiore Einstein Comprehensive Cancer Center (MECCC) have found a low-cost antibacterial regimen for preventing acute radiation dermatitis (ARD). This painful skin condition affects up to 95% of people undergoing radiation treatment for cancer but lacks a standardized treatment.

Beth N. McLellan, M.D., and colleagues reasoned that *Staphylococcus aureus* (SA) bacteria—which typically live harmlessly on the skin—might play a role in ARD. To find out, they conducted a study involving 75 patients undergoing radiation therapy.

Participants were randomized to receive either the standard of care at

MECCC (normal hygiene and moisturizers) or the experimental antibacterial regimen, involving the body cleanser chlorhexidine and mupirocin 2% nasal ointment. (The team had found in other research that many patients with SA on their skin also tested positive for nasal SA, suggesting that SA from the nose might be infecting the skin.)

Although more than half the patients treated with the antibacterial regimen developed mild-to-moderate ARD, no patients developed moist desquamation—the most severe type of ARD, which causes the skin to break down and develop sores—and no patients experienced adverse effects from the treatment. In contrast, severe ARD affected 24% of the



participants receiving the standard of care.

The treatment could potentially save hundreds of thousands of people each year in the U.S. from severe ARD and its excruciating side effects. The findings were published in May 2023 in *JAMA Oncology*. Dr. McLellan is a professor of medicine at Einstein, the chief of the division of dermatology at Montefiore and Einstein, and a member of MECCC.



### Lab Chat

**F**rank Soldner, M.D., studies how genetic, epigenetic, and environmental factors contribute to the development of neurological disorders. A native of Germany, Dr. Soldner joined the Einstein faculty in 2019. He is now an assistant professor in the Dominick P. Purpura Department of Neuroscience and an assistant professor of genetics. His research is funded in part by a grant from the Aligning Science Across Parkinson's initiative.

#### Why did you shift from clinical practice to basic research?

In medical school [at the University of Tübingen, Germany], I took advantage of an opportunity to do Ph.D.-level research, to get a taste of it. That led to a fellowship in stem cell research at the National Institutes of Health [NIH], and I was hooked. It was a very interesting time for the field.

#### How so?

New technologies were fundamentally changing basic research, especially the use of induced pluripotent stem cells [iPSCs]. We take a patient's blood or skin cells, reprogram them into pluripotent stem cells, and then coax the stem cells to differentiate into cells of interest such as a person's neurons. That allows us to study human neurological disease in cell culture.

#### Are iPSCs important in your work?

They've been central to my research since my postdoctoral studies with Dr. Ron McKay at the NIH and Dr. Rudolf Jaenisch at the Massachusetts Institute of Technology. Together we found new ways to use iPSCs to study the genetic basis of PD [Parkinson's disease].

#### Inherited genetic mutations account for just 10% of PD cases. What causes the other 90%?

Dozens of genetic variants have been identified in that large majority of PD patients with no family history of the disease—what we call “sporadic PD.” Those variants are not sufficient to cause PD on their own but are thought to substantially increase the risk for developing it.

#### Are you studying those variants?

I'm studying how the risk variants interact with other genetic and environmental factors to cause sporadic PD, and how the same variants may interact with inherited mutations to influence the development and progression of familial forms of PD. This involves using iPSCs as well as three-dimensional brain organoids.

#### Brain organoids?

In essence, these are minibrains that we grow in tissue culture from the cells of patients. Organoids replicate some of the structural and functional features of actual human brains, so they move us one step closer from iPSCs to modeling the real thing.



#### What are you studying with your latest NIH grant?

Histone acetylation, a common epigenetic process that influences gene expression. Compelling evidence suggests that histone acetylation is dysregulated in neurodegenerative diseases, but the underlying mechanisms are not known.

#### Is there a role for artificial intelligence [AI] in your work?

Genetics researchers have been using machine learning, a form of AI, for some time. For example, AI helps us see in large datasets patterns that we cannot detect with conventional tools.

#### What do you like to do outside the lab?

My wife and I are foodies. We love sampling restaurants in New York. We also love to travel, usually internationally, but since COVID-19 we've been exploring national parks around the United States. This country is so diverse, so beautiful.

Photo by Jörg Meyer

## RESEARCH NOTES: MAJOR NIH AWARDS



### Gaining Insights Into TB

Michael Berney, Ph.D., has received two five-year National Institutes of Health (NIH) grants totaling \$5.7 million to study *Mycobacterium tuberculosis* (*Mtb*), the bacterium that causes tuberculosis (TB). One grant funds research on phthiocerol dimycocerosate (PDIM)—a lipid in *Mtb*'s cell envelope that strongly influences *Mtb*'s virulence and drug resistance. Spontaneous PDIM loss has plagued TB research for decades. Dr. Berney and colleagues are developing new tools to prevent PDIM loss, allowing reproducible research into TB pathogenesis and discovery of vaccines and drugs. Under the second grant, Dr. Berney and a Swiss collaborator will use a new methodology combining metabolomics and CRISPR interference to characterize large libraries of anti-TB compounds with unknown modes of action. Their resulting atlas of *Mtb* gene/drug/metabolic interactions should aid in developing new drugs to help eradicate TB. Dr. Berney is an associate professor of microbiology & immunology at Einstein.



### Investigating the Rise of Type 2 Diabetes in Children

The number of youths under age 20 living with type 2 diabetes nearly doubled between 2001 and 2017. Aside from a rise in childhood obesity, the reasons for this increase aren't clear. The NIH has awarded the Children's Hospital at Montefiore (CHAM) and Einstein a six-year, \$4.1 million grant to participate in a national study to identify possible biological and social factors (such as food insecurity and housing insecurity) that may be causing children and adolescents to develop the condition. The site was chosen in part because Bronx children have elevated rates of obesity-related metabolic disorders. The national study will enroll 3,000 children at 15 clinical sites. At CHAM and Einstein, 250 overweight or obese children between ages 9 and 14 will be enrolled. The project leader is Carmen R. Isasi, M.D., Ph.D., professor of epidemiology & population health and of pediatrics and associate director of the New York Regional Center for Diabetes Translation Research at Einstein.



### Assessing Brain Activity to Predict Dementia Risk

The ability to detect dementia early—before a person's daily functioning is noticeably impaired—might allow for interventions that delay cognitive decline. The NIH has awarded Pierfilippo De Sanctis, Ph.D., a five-year, \$3.8 million grant to test whether dementia can be predicted by measuring patterns of brain activity in older adults engaged in complex gait (walking) tasks. Using novel portable electroencephalographic devices that they've developed, Dr. De Sanctis and colleagues will determine the neural signature of functional decline by comparing cognitively unimpaired older adults with and without subclinical Alzheimer's disease as they perform complex gait tasks. By accurately predicting dementia risk at an early stage, this noninvasive and relatively inexpensive approach may help elderly people maintain their quality of life. Dr. De Sanctis is an assistant professor of pediatrics and in the Saul R. Korey Department of Neurology at Einstein.

## RESEARCH NOTES: MAJOR NIH AWARDS



### Curbing Smoking Among People with HIV

About half of the people with HIV (PWH) in the United States smoke cigarettes, and smoking is now the leading killer of PWH. The National Cancer Institute (NCI) has awarded Jonathan Shuter, M.D., and colleagues a five-year, \$3.5 million grant to test whether a novel harm-reduction approach designed specifically for PWH who smoke can reduce morbidity and mortality. The intervention includes cutting down on cigarettes, screening for lung cancer, and controlling blood pressure. Four hundred PWH who smoke will receive either the harm-reduction intervention or routine care. After nine months, participants in the two groups will be assessed for primary outcomes, including changes in the number of cigarettes smoked daily, the proportion of participants screened for lung cancer, and changes in blood pressure. Dr. Shuter is a professor of medicine and of epidemiology & population health at Einstein and an infectious-disease specialist at Montefiore.



### Hope for a Herpes Vaccine

No vaccines can prevent herpes simplex virus (HSV) infections, which cause serious health problems. Previous failed vaccine efforts targeted HSV glycoprotein D (gD), which elicits only neutralizing antibodies. Betsy Herold, M.D., and colleagues have developed a “non-gD” candidate vaccine that elicits antibodies that generate antibody-dependent cell-mediated cytotoxicity (ADCC). The NIH has awarded them a five-year, \$3 million grant to characterize these ADCC-mediating monoclonal antibodies in mouse models of HSV infection; determine how deletion of gD allows for the generation of ADCC; and study interactions between gD and the immunomodulatory molecule herpes entry mediator, which most immune cells express. The findings may lead to vaccines for HSV and other pathogens. Dr. Herold is a professor of pediatrics, of microbiology & immunology, and of obstetrics & gynecology and women’s health at Einstein, and is the chief of the division of pediatric infectious diseases and vice chair for pediatric research at CHAM and Einstein.



### Studying Redevelopment’s Impact on Heart Health

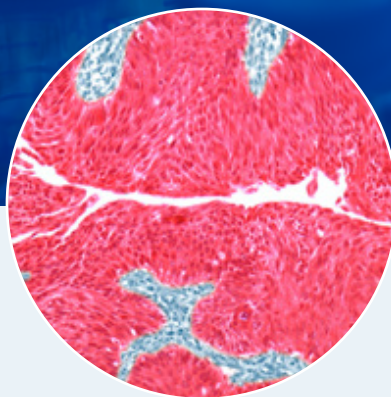
Researchers led by Earle Chambers, Ph.D., M.P.H., have received a four-year, \$2.9 million grant from the NIH to study how neighborhood redevelopment affects cardiovascular disease (CVD) among older Black and Hispanic residents in the Bronx, home to the poorest urban congressional district in the United States and to numerous redevelopment projects. CVD is the country’s leading cause of death. The researchers will compare the prevalence of CVD events (such as heart attacks and strokes) and CVD risk factors (such as hypertension, diabetes, and obesity) among cohorts of midlife and older residents of two Bronx neighborhoods: the Jerome Avenue area, which is undergoing redevelopment, and the Southern Boulevard area, which is not. Dr. Chambers is a professor and the director of research in the department of family and social medicine and a professor of epidemiology & population health and of psychiatry and behavioral sciences at Einstein.





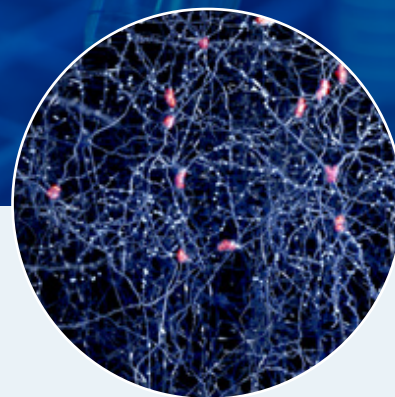
### Training Cancer Specialists to Focus on Health Equity

The NCI-designated Montefiore Einstein Comprehensive Cancer Center (MECCC) has received a five-year, \$2.9 million NCI grant to train physicians and scientists to conduct clinical and translational oncology research, with a special emphasis on investigating and addressing health inequities in the Bronx. The funding, part of the Paul Calabresi Career Development Award for Clinical Oncology (PCACO), will support up to four scholars for two to three years. The MECCC has enrolled 24 scholars since receiving its first PCACO grant in 2010. Principal investigators are Amit Verma, M.B.B.S., MECCC's associate director of translational science and director of the division of hemato-oncology at Einstein and Montefiore; and Yvonne Saenger, M.D., co-director of the cancer therapeutics program and director of the cancer immunotherapy program at MECCC and associate professor of oncology, of microbiology & immunology, and of pathology at Einstein.



### Developing Novel Compounds Against Bladder Cancer

The survival rate for bladder cancer—one of the most common cancers in the United States—has not improved over the past three decades. Xingxing Zang, Ph.D., has received a five-year, \$2.7 million grant from the NCI to identify and develop novel immune checkpoint inhibitor (ICI) drugs for treating bladder cancer. ICIs are monoclonal antibodies that prevent tumor cells from suppressing attacks by immune cells. Dr. Zang has already identified a novel therapeutic target: the previously unrecognized immunosuppressive pathway in which the protein HHLA2 on bladder-cancer cells binds to the receptor KIR3DL3 on T cells and natural killer cells. He will study the function of the KIR3DL3/HHLA2 pathway in bladder cancer and develop ICIs to interrupt the pathway. Dr. Zang is a professor of microbiology & immunology, of oncology, of medicine, and of urology, the Louis Goldstein Swan Chair in Women's Cancer Research at Einstein, and a member of MECCC.



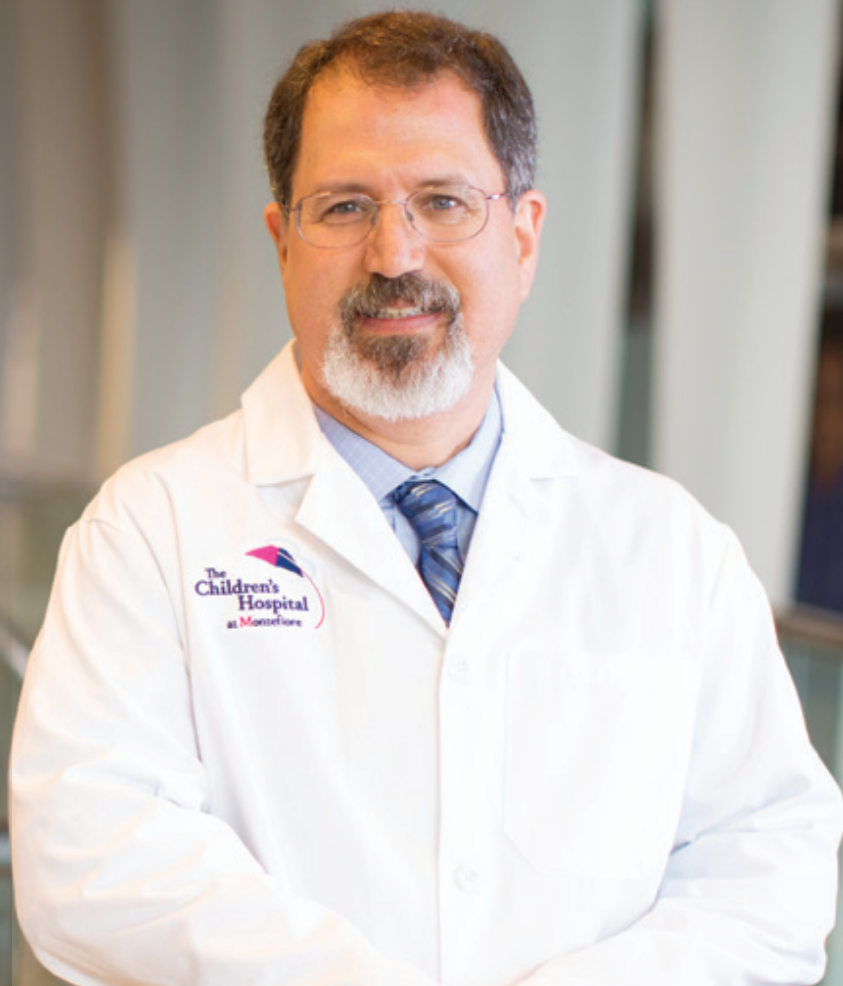
### Understanding Brain Activity During Sleep and Wakefulness

Sleep and wakefulness influence both cognitive and overall health, yet the neural mechanisms that regulate them are not well understood. The NIH has awarded Renata Batista-Brito, Ph.D., a five-year, \$2.6 million grant to investigate the role played by long-range inhibitory neurons of the cerebral cortex during sleep and wakefulness. Dr. Batista-Brito and her colleagues hypothesize that the activity of cortical long-range inhibitory neurons that express SST and nNOS—the so-called SST/nNOS neurons—generate slow cortical rhythms that regulate the transition from the brain's highly active “up” state to its less-active “down” state. Since those rhythms are believed to affect memory and other brain functions, the activity of SST/nNOS neurons may therefore profoundly influence our sleeping and waking lives. Dr. Batista-Brito is an assistant professor in the Dominick P. Purpura Department of Neuroscience, of genetics, and of psychiatry and behavioral sciences at Einstein.

# MONTEFIORE AND EINSTEIN MAVENS OF MEDICINE

## Making a Difference for Kids with Cancer

Q&A With Dr. David Loeb



**D**avid Loeb, M.D., Ph.D., is a professor of pediatrics and of developmental and molecular biology at Einstein, the chief of hematology/oncology in the department of pediatrics and at the Children's Hospital at Montefiore, and a member of the National Cancer Institute–designated Montefiore Einstein Comprehensive Cancer Center (MECCC). A native of Maryland, he graduated with an M.D. and a Ph.D. from Columbia University's Medical Scientist Training Program. He came to Einstein and Montefiore in 2017 after 17 years at Johns Hopkins University.

### **When did you first know that you wanted to study cancer?**

My summer after high school I worked in a lab at the National Institutes of Health doing cancer research. I decided that I wanted to study biology, get a Ph.D., and run my own lab. When I got to the clinical part of my M.D./Ph.D. program, I discovered that I really liked taking care of patients, so I opted to become a clinician-researcher. During my pediatrics rotation, I realized that there was a specialty called pediatric oncology.

**Why have you focused on sarcomas [cancers of the bone and soft tissues]?**

I was a junior researcher working on leukemia when Hopkins created a program for sarcoma, a cancer that strikes mainly children and adolescents, and I was asked to run it. I soon realized that outcomes for almost every field of pediatric oncology had improved in the previous few decades, but the survival outlook for kids with metastatic sarcomas was no better than in the 1980s. If you're curing only 20 percent of those kids, there's a huge opportunity to do research that will make a difference in patients' lives.

**Isn't pediatric oncology a tough field emotionally?**

I hear that all the time. There's no better way to stop small talk at a party than to say that you treat kids with cancer for a living. But the truth is that even though they have cancer, kids are often cheerful and upbeat. The pediatric floor of the hospital is a happy place to be, and I like working with kids.

**What brought you to Einstein?**

I responded to the search committee on something of a whim. Then I went to dinner with several division chiefs, and it was one of the first times in my life that I felt imposter syndrome. It occurred to me that working in a place filled with so much intelligence and talent would be a good thing. Almost everybody I talked to on campus with a lab was excited about the projects we could collaborate on. I was also drawn to the social-justice mission that permeated all my conversations on both the medical and the research side.

**One of your lab's achievements was developing a new mouse model for metastatic sarcoma. Why was that needed?**

Until then, most people used what's called a tail-vein model, injecting cancer cells into a mouse's tail and hoping that the bloodstream would carry them to a place in the body where they would start to grow—not the best model for metastasis, since a primary tumor wasn't involved. We discovered that we could create a primary tumor by implanting tumor fragments into a mouse's leg bone, allowing us to study how cancer cells find their way from that tumor to the lungs and other organs and to investigate therapies to prevent that from happening.

**Could you talk about the connection between signaling pathways and bone cancer?**

The Wnt signaling pathway normally drives precursor cells to form bone cells, but can lead to cancer when it goes awry. We showed that aberrant Wnt signaling is involved in both Ewing sarcoma and osteosarcoma—the two most common forms of bone tumors in children, adolescents, and young adults. Now we've identified a compound from a small pharmaceutical company that appears to stop abnormal bone-cell growth by targeting a different pathway. If the drug proves effective in mouse models, I'm optimistic that the company will support a clinical trial in kids with bone cancer.

**How did you realize that an antiviral drug might work against cancer?**

That's a cool story. I was having coffee with a former postdoc colleague who mentioned that he was working with a

compound originally developed as an antiviral; it inhibits the enzyme DDX3, which RNA viruses such as HIV and hepatitis C depend on. My friend had found that it killed breast cancer stem cells and suggested we try it against Ewing sarcoma stem cells. We found that DDX3 is expressed at high levels in almost all the sarcomas we looked at, and that this DDX3-inhibiting compound kills sarcoma stem cells. We later discovered that DDX3 helps repair DNA damaged by radiation, suggesting that the DDX3 inhibitor could boost the efficacy of the radiation therapy that many sarcoma patients require. In the radiation oncology world, one of the holy grails is relatively nontoxic drugs that make therapy more effective without having to increase the radiation dose. My friend has formed a company to develop the drug and we hope to test it in clinical trials next year.

**What are you working on that could have a big impact in the near future?**

We need a better way to identify which kids are likely to be cured by their original therapies and which ones face a high risk for relapse and require continued treatment. So my MECCC colleague Dan Weiser [M.D.] and I are looking for biomarkers of cancer spread, based on tumor DNA and cytokines [small proteins] in the bloodstream. MECCC is part of a multi-institution clinical trial collecting and analyzing blood, at predefined times throughout their treatment, from young patients with solid tumors. We're optimistic about finding biomarkers that will help us distinguish between kids who need additional, intensive treatment and those who can entirely avoid further therapy. **E**





# A PATH TO SUCCESS

## THE EINSTEIN ENRICHMENT PROGRAM PREPARES BRONX STUDENTS FOR CAREERS IN MEDICINE AND SCIENCE BY TERESA CARR



When Annel Fernandez was in high school, she thought she might one day pursue medicine as a career. As a daughter of immigrants from the Dominican Republic, she saw firsthand how chronic diseases and a lack of access to healthcare affected the quality of life of her friends and family in the South Bronx.

Then, in her sophomore year, she learned about and was accepted into the Einstein Enrichment Program (EEP).

“It just felt like home,” she says of EEP, which offered her exposure and mentorship in the fields of science and medicine throughout her high school years. “Being surrounded by mentors and faculty who care about you and believe in you does wonders for your ability to succeed.” Dr. Fernandez is now an internal-medicine resident in Boston.

Launched at Einstein in 1988, EEP serves high-achieving Bronx high school

students from groups historically under-represented in the science, technology, engineering, and mathematics (STEM) fields or who are economically disadvantaged. The program is supported on an annual basis primarily by the New York State Education Department’s Science and Technology Entry Program, with Einstein contributing some of the funding. This year’s EEP has space for 77 participants, and the number of applicants always exceeds the available spots.

Most students enter the program as high school sophomores or juniors who have grade point averages of 85 or higher. Twice a week after school, students go to Einstein lecture halls for instruction in algebra, biology, chemistry, and physics and to hear from healthcare professionals,

prepare for standardized tests, learn study skills, and work through college and financial-aid applications. (The program was virtual during the past three years because of the COVID-19 pandemic.) In the summer, EEP students spend four days a week over four weeks pursuing research projects and shadowing healthcare professionals.

“We attract a dedicated, hard-working group of young people,” says Nilda I. Soto, who retired in May 2023 after 33 years as EEP’s director. She’s justifiably proud of the program’s success. “One hundred percent of our graduates go on to college, often with scholarships,” she says. She notes that alumni have entered careers in business, law, and teaching in addition to healthcare.

The program’s new director, Reginald Hayes, Einstein’s assistant dean of outreach and pathway programs in the office of diversity and inclusion, is concerned that the pandemic has worsened the already wide educational deficit between underresourced Bronx schools and those in more-affluent areas. “That

High school students enrolled in the Einstein Enrichment Program use a bag valve mask on an adult mannequin as part of basic life-support training in July in the Montefiore Einstein Center for Innovation in Simulation.

Photo by Jörg Meyer







At top, Cynthia Akwatu, at far left, as an Einstein Enrichment Program participant; above, as an Einstein medical student; and below, second from left, with friends at a 2018 EEP awards dinner, where she was the student speaker.



**"I want to do something meaningful day to day that also positively affects the community as a whole."**

— CYNTHIA AKWATU,  
MEDICAL STUDENT

deficit is why EEP has existed for so long and why the need for the program continues," he says.

We caught up with five EEP alumni to talk about where they are now and how the program has helped shape their lives and careers in medicine and science.

## CYNTHIA AKWATU EINSTEIN CLASS OF 2026

Watching doctors in action while she was still in high school steered Cynthia Akwatu toward a medical career. During her summers in EEP, she shadowed a pediatric gastroenterologist and a trauma surgeon at Jacobi Medical Center. She got to watch physicians examine a child's esophagus with an endoscope, perform laparoscopic gallbladder surgery, and remove a bullet from a gunshot wound.

The medical teams told her that she could sit in the back if she got nauseated or dizzy, but instead she experienced fascination—and ambition. "My first times in the operating room made me realize what an impact a doctor can have on a patient's life," she says. "It made me want to go into some type of surgical specialty."

Ms. Akwatu's parents emigrated from Nigeria to the United States before she was born, and she is a citizen of both countries. As a Nigerian American, she felt comfortable that many of the healthcare professionals she met through EEP—including the physicians she shadowed—were from groups underrepresented in medicine. "They were people who looked like me," she says. "If they could become doctors, I knew I could too."

She was valedictorian of her Bronx high school and had the highest grade point average among the graduating seniors in EEP. She received several scholarships to attend the University of Pennsylvania, where she earned a bachelor

of arts degree in neuroscience. She is now attending Einstein on a full scholarship awarded by the federal government's National Health Service Corps program.

Ms. Akwatu is interested in a career in obstetrics and gynecology. She is motivated by statistics showing that the Bronx has one of the country's highest maternal mortality rates, with Black women far more likely to die in childbirth than women of other races. "That resonated with me," she says. "I want to do something meaningful day to day that also positively affects the community as a whole."

## ANNEL FERNANDEZ, M.D. INTERNAL MEDICINE

For the three years that Dr. Fernandez participated in EEP, her father worked in a bodega and did other part-time work. Yet he also found time to drive his daughter and her classmates to Einstein, often waiting in the car for hours until it was time to drive them home. "It was a huge sacrifice and commitment from him," says Dr. Fernandez. "But my family's understanding was that this program was so important to our future."

EEP helped her tap into her desire to serve people in her community. For example, working with other EEP students, she developed information for teens on sexually transmitted diseases, which she distributed at health fairs. She helped create brochures outlining ways in which teens could cope with having a parent diagnosed with breast cancer.

She founded a health leaders' club at her all-girls high school after noticing that many students lacked knowledge about the path toward a medical degree. She brought physician speakers from EEP to her school and led events educating her peers about relevant health topics. "It was a way for me to share and



**“Being surrounded by mentors and faculty who care about you and believe in you does wonders for your ability to succeed.”**

— DR. ANNEL FERNANDEZ



Above, Annel Fernandez with Einstein Enrichment Program director Nilda I. Soto and science instructor Lou Cirillo in 2012; at top right, as a resident at Harvard's Brigham and Women's Hospital in Boston; at right, as a Bronx high school senior in 2012.



expand on this wonderful resource that is EEP,” she says.

Dr. Fernandez’s next destination—Columbia University—was a bit of a culture shock. After struggling to fit in and keep up academically, she found support from someone she’d met through EEP—a pediatric resident a few years her senior who, like her, was Hispanic and from the Bronx. “She gave me the confidence to know that I could do it,” says Dr. Fernandez. “Eleven years later, she’s still my mentor.”

After graduating with a psychology degree, Dr. Fernandez worked at the Hospital for Special Surgery in New York City, assisting with clinical trials in rheumatology. She went on to medical school at Columbia’s Vagelos College of Physicians and Surgeons and last year began her internal-medicine residency at Harvard’s Brigham and Women’s Hospital.

Dr. Fernandez is planning to specialize in gastroenterology. She hopes to serve as a bridge between academic medical centers and community organizations, advancing research that actively engages community members. “I’m truly passionate about creating evidence-based health interventions in real-world settings—that’s the work I want to do,” she says.

## MAUDINA GUMBS, M.D. PEDIATRICS

**M**audina Gumbs, M.D., knew she wanted to be a doctor the moment she first used a stethoscope. During her summer EEP program, she was shadowing a pediatric resident at Montefiore who guided her through examining young patients. “That’s when I felt that this was my calling,” she recalls.

After using the stethoscope on a couple of patients, she was reluctant to let go of the precious instrument. “The resident looked at me and said, ‘My stethoscope, please,’” she says, laughing. “But I was having a moment with myself, holding the stethoscope and feeling like I was the physician.” EEP also gave her the opportunity to meet healthcare professionals from backgrounds like hers. An Einstein medical student who was a speaker for one of her EEP classes ended up becoming one of her best friends. “She was also a Black female interested in pediatrics, so we bonded.”

Following high school, Dr. Gumbs enrolled in the City University of New York’s Sophie Davis School of Biomedical Education in a seven-year program that combines undergraduate education with medical school.

**“The EEP allowed a girl from a small high school in the Bronx to explore her interests. Everything that I wanted to be, I am.”**

— DR. MAUDINA GUMBS





Students fulfill all the requirements for a bachelor of science degree during the first three years of the program before completing four years of medical school—in Dr. Gumbs's case, New York Medical College.

She was then accepted as one of just four residents in Montefiore's competitive social pediatrics program and found she connected well with patients, who trusted and appreciated her. "I'm a Black woman, and I practice in a predominantly Black and Hispanic area," she says.

Dr. Gumbs now works at Montefiore's Comprehensive Family Care Center. A Bronx native, she still lives in the borough, treats many families from her neighborhood, and is the mother of two girls, ages 4 and 9. She believes that her effectiveness as a pediatrician stems from the close relationships she forms with her patients. When she recently made a hospital visit to see a newborn, the baby's parents asked her to be the godparent.

"The EEP allowed a girl from a small high school in the Bronx to explore her interests," Dr. Gumbs says. "Everything that I wanted to be, I am. And being part of EEP is definitely why I'm here today."

## MOHAMMAD KABIR, PH.D. RARE DISEASES

When Mohammad (MD for short) Kabir, Ph.D., was 12, he moved with his parents from Bangladesh to the Bronx. Mastering English—his fifth language—took him a while, but the sciences came naturally. His guidance counselor suggested during Dr. Kabir's first year in high school that he apply for EEP, but he was worried about the required essay; his family had no computer.

He wrote a one-page essay with pencil and paper and was accepted into the program. "It completely changed my life," says Dr. Kabir, who recently graduated with a Ph.D. in biomedical sciences with a focus on chemical biology and medicinal chemistry from the Icahn School of Medicine at Mount Sinai.

EEP exposed him to scientific thinking, he says, and to role models in medicine. One summer, he helped develop a tool to assess whether patients were ready to move on from intensive care. The next, he shadowed an emergency physician at Montefiore Medical Center as the doctor treated everything from convulsions to a severed finger. He admired the doctors who had the confidence and the

competence to jump in and save a life.

Dr. Kabir says that he graduated from EEP knowing two things: "First, that I wanted to be a scientist, and second, that I wanted to use science to help people."

After falling in love with research while attending the City College of New York, Dr. Kabir spent three years at the National Institutes of Health in Bethesda, Md., helping develop drugs to treat rare diseases. He has continued that line of research at Mount Sinai, where he looks for molecules that target proteins implicated in cancers and other diseases. He recently developed a technology for creating drugs that suppress tumor growth and potentially treat peripheral neuropathy. After another year or so of research, he plans to launch a company to bring that technology to patients.

Dr. Kabir says he is grateful for the support he received through EEP and soon will pay it forward. This fall he'll be mentoring students enrolled in Einstein's EEP.

Service is the thread connecting generations of EEP students, says Mr. Hayes, the EEP director. "The young people we are training and sending forth realize that the health professions are about helping people," he says. "They've connected their privilege in having opportunities to their responsibility to serve humanity, to treat people with dignity and respect."

## AMADOU N'DOW, M.D. EMERGENCY MEDICINE

Amadou N'Dow, M.D., an emergency medicine physician at Mercy Medical Center in Bethpage, N.Y., had wanted to be a doctor since he was a toddler. Severe childhood allergies meant that he spent lots of time in doctors' offices, where he developed close relationships with his healthcare team. In particular,



**"I graduated from EEP knowing two things. First, that I wanted to be a scientist, and second, that I wanted to use science to help people."**

— DR. MOHAMMAD KABIR



**"My family, my peers, my friends and their families—none wanted to go into medicine. What normalized it for me was EEP—being exposed to healthcare professionals who looked like me and to other students from similar backgrounds who shared my interests." — DR. AMADOU N'DOW**



At left, Amadou N'Dow, M.D., with his mother, Luner Graham, in 2003 at his graduation from Mount Saint Michael Academy in the Bronx; above, as an emergency department physician in Long Island, N.Y.



he looked up to his pediatrician, who was also of African descent. (Dr. N'Dow has an African father and a Jamaican mother.) He remembers thinking, when he spotted an EEP flyer in his high school guidance counselor's office, "Why not?"

"Initially, I think, the biggest attractions were the free MetroCard subway pass and the stipend students receive over the summer," he says, laughing. (EEP students earn between \$500 and \$750 for participating in summer research programs.) But he now sees that time as pivotal to his career. "Medicine can be a difficult path to pursue where I come from," says Dr. N'Dow. "My family, my peers, my friends and their families—none wanted to go into medicine. What normalized it for me was EEP—being exposed to healthcare professionals who looked like me and to other students from similar backgrounds who shared my interests."

After graduating from Binghamton University, Dr. N'Dow spent a couple

of years taking additional science classes at the City University of New York and conducting research at Einstein. His efforts paid off, and he joined the Class of 2013 at Drexel University College of Medicine in Philadelphia.

"Even now, in my hospital, I can count on one hand the number of doctors who look like me, a Black male physician," he says. "When I see patients in the emergency department and I'm interacting with people from all different backgrounds, that's the one thing they say—'Oh, wow, I've never seen a Black male physician.' So even in 2023, it's not nearly as common as people would think."

Dr. N'Dow vividly remembers, while in EEP, shadowing a senior pharmacist at Jacobi Medical Center. "He was an older Jamaican gentleman who carried himself in such a professional manner and treated everyone with respect, including folks he supervised," he recalls. "I wanted to emulate that attitude, and it's become part of my identity as a physician." **E**

## A Pathway to Diversity

**H**ow can medical schools such as Einstein sustain their commitment to diversity in their M.D. programs in light of the U.S. Supreme Court ruling earlier this year on race-conscious admissions?

Lynne M. Holden, M.D., senior associate dean for diversity and inclusion at Einstein, says one way is through pathway programs such as the Einstein Enrichment Program. "These programs introduce young people from groups that are underrepresented in science and medicine to health careers and enhance their ability to apply to and matriculate into medical school," she says.

"Einstein's various pathway programs have offered thousands of students a chance to shadow physicians, attend medical workshops and lectures, perform research, connect with mentors, build networks, and much more. Now more than ever these programs are needed to help students from underrepresented groups."

Dr. Holden, who is also a professor of emergency medicine at Einstein and an emergency medicine physician at Montefiore, speaks from personal experience. "I would not be where I am without the help of six pathway programs," she says. "Pathway programs are not only near and dear to my heart, but they're integral for academic enrichment, experiential learning, and exposure to biomedical professionals and networking with like-minded peers."





# CANNABIS: FROM MENACE TO MEDICINE

Once regarded as a threat to civilized society, cannabis is morphing into a promising drug

BY GARY GOLDENBERG

**A**ddiction specialist Julia Arnsten, M.D., M.P.H., is frustrated. “You’d think that by now, thousands of years after healers began using cannabis, we’d have more answers about its medicinal value,” says Dr. Arnsten, chief of the division of general internal medicine at Einstein and Montefiore and professor of medicine, of epidemiology & population health, and of psychiatry and behavioral sciences at Einstein.

Illustrations by Stephanie Dalton Cowan



Rx

☐ Indica

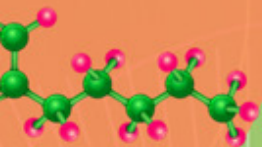
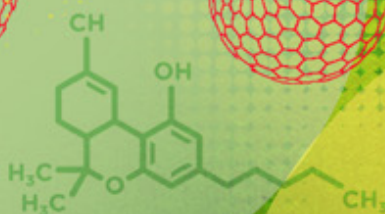
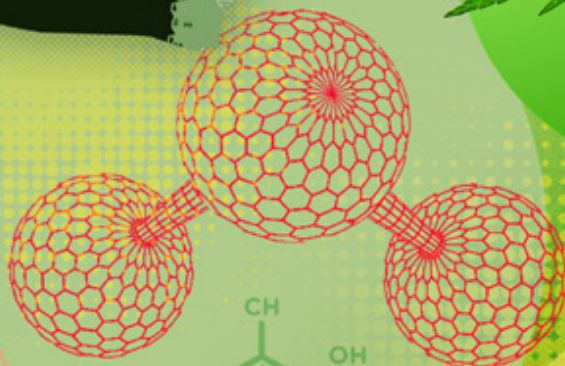
☒ Sativa

☒ Hybrid

Strain Jolly Heron

In compliance with CA Prop 215 SB 420  
Section 11362.5 and 11362.7 of HSC Do not  
drive or operate heavy equipment Keep out  
of reach of children  
Unlawful to redistribute

3.5 Gram(s)







## CANNABIS: FROM MENACE TO MEDICINE



**"Our goal here is pain relief. We're just trying to demonstrate safety and efficacy."**

—DR. JULIA ARNSTEN

In 2016, after New York State legalized cannabis for medical use, Dr. Arnsten began looking for safer alternatives to opioids for the one in five American adults suffering from chronic pain. Medical cannabis—offering pain relief with far less potential for abuse compared with opioids—seemed to fit the bill. Yet conducting research with cannabis was, and still is, rife with legal and regulatory hurdles. (See the glossary on the facing page for the difference between cannabis and marijuana.) "Our goal here is pain relief," says Dr. Arnsten, distilling her work down to its essence. "We're just trying to demonstrate safety and efficacy."

She is among a group of Einstein and Montefiore researchers investigating the potential of cannabis for treating various types of pain as well as autism spectrum disorders and other conditions. They're also working to educate patients about the risks and benefits of medical cannabis, reduce disparities in access to the drug, and establish clinical guidelines for its use.

The need is urgent: Although federal law still prohibits the use of cannabis, all but three states (see the map on page 30) have now legalized it in some form—and its use is increasing, with nearly one in five Americans having tried cannabis at least once during 2019, according to the U.S. Centers for Disease Control and Prevention. But like all drugs, cannabis can cause adverse effects, such as cannabis-use disorder (see facing page). Ideally, Einstein and Montefiore's medical-cannabis research will help reveal both benefits and risks.

### MEDICAL CANNABIS VS. OPIOIDS

"Over the years, I've had a lot of patients who've told me that cannabis helped alleviate their pain, and they wanted

something other than opioids," Dr. Arnsten says. "But even after medical cannabis was legalized in New York, I didn't want to be just another dispenser, recommending this or that flower to smoke. We knew very little about how to use cannabis or if it worked at all. As practitioners in the field, we weren't managing it properly."

In 2017, Dr. Arnsten and colleagues launched the Medical Marijuana and Opioids (MEMO) study—the first long-term investigation into whether cannabis can reduce opioid use among adults with chronic pain; it was recently completed.

The study, funded by the National Institutes of Health (NIH), involved 225 participants with different ailments and varying degrees of opioid use. Based on interim responses on a self-assessment scale, cannabis users reported less pain, greater enjoyment in life, and higher levels of activity, while at the same time noting that they were able to reduce their use of opioids.

The trial suffered from a major limitation: The researchers had no control over the types of cannabis extract purchased by participants.

Cannabis comes in many forms: It can be smoked or vaped (inhaled) or swallowed in gummies or tinctures; doses can vary, and so can the ratios of active ingredients. To abide by state and federal regulations, however, the researchers were required to send study subjects to licensed state dispensaries, where pharmacists ultimately decided which participants got which formulations, based on clinicians' recommendations.

Dr. Arnsten hopes to get more data from a randomized, double-blind study called ReLeaf, which is funded by the Laura and John Arnold Foundation and ends in October 2023. Like MEMO,

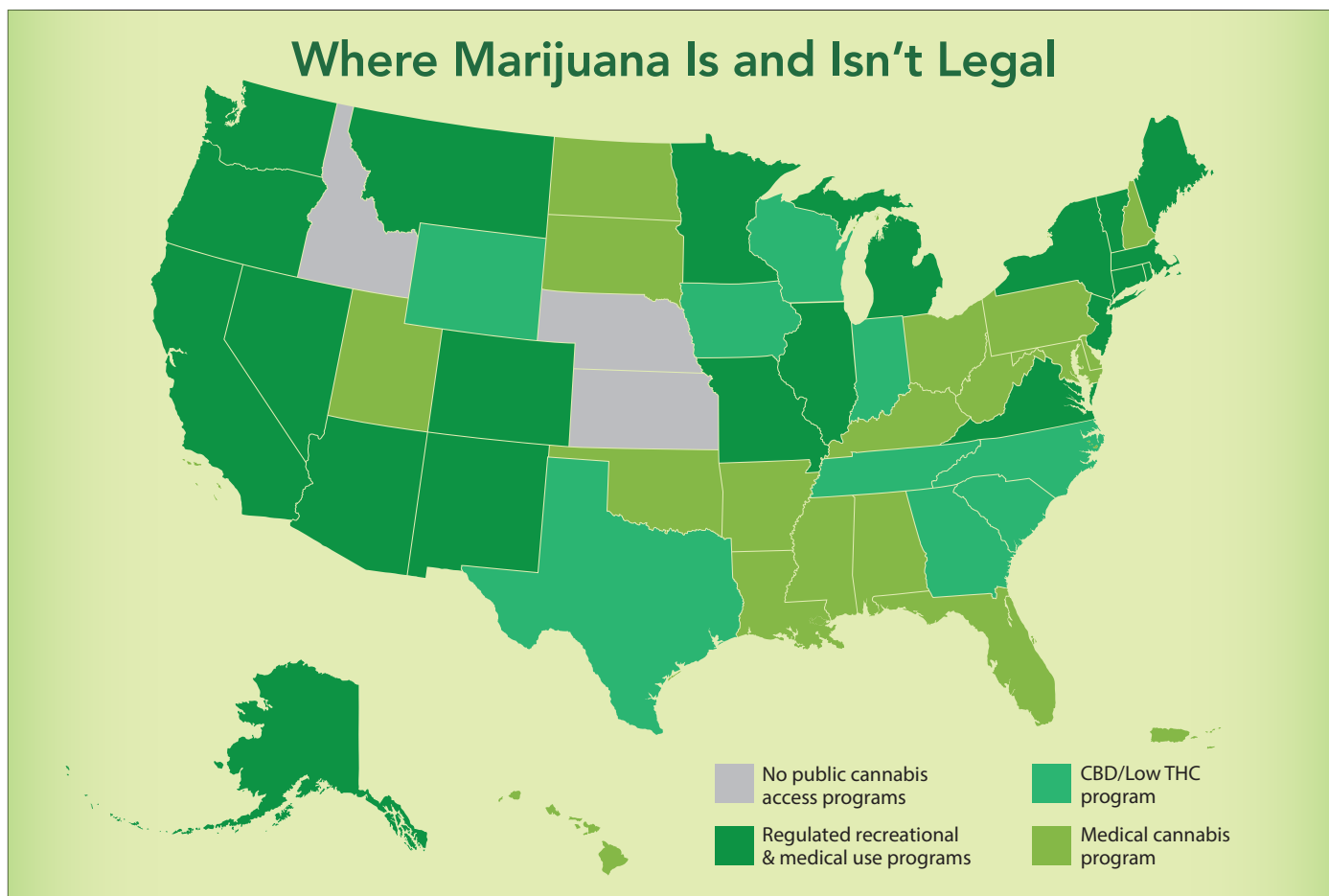






# A Cannabis Glossary

- **Cannabinoids:** A class of compounds, found in the cannabis plant as well as humans and other animals, that bind to certain nerve-cell receptors.
- **Cannabis:** Any plant of the genus *Cannabis* with leaves and flowering tops having intoxicating effects as well as psychoactive effects in the brain that can alter perception, mood, cognition, and behavior.
- **Cannabis-use disorder:** The inability to stop using cannabis even if it's causing health and social problems. A 2015 survey published in *JAMA Psychiatry* found that approximately three in 10 cannabis users have the disorder. Long-term or frequent cannabis use has also been linked to increased risk of psychosis or schizophrenia in some users.
- **Endocannabinoids:** Cannabinoids naturally produced by our bodies.
- **Hashish:** Concentrated resin made from the flowering buds of female cannabis plants, which produces a more-potent high than marijuana.
- **Hemp:** A variety of cannabis cultivated for its fiber, edible seeds, and oils, usually containing very low levels of THC. Hemp is legal in the U.S.
- **Marijuana** (a.k.a. weed, pot, Mary Jane): While often used interchangeably with cannabis, these terms refer more specifically to those parts of the plant that, when smoked or swallowed, make you feel high.
- **Medical cannabis or medical marijuana:** Derivatives of the cannabis plant that are used to ease symptoms caused by certain medical conditions.
- **Phytocannabinoids:** Any of the 100 or so compounds found in the cannabis plant, including:
  - *Cannabidiol (CBD)* and *Cannabidivarin (CBDV)*: Two chemically similar cannabis ingredients that have psychoactive properties but don't produce a high. CBD, the second most common cannabis ingredient after THC, is widely sold for treating conditions such as pain, anxiety, inflammation, and insomnia. Under federal law, U.S. consumers can purchase CBD and CBDV products as long as they are hemp derived and contain only trace levels of THC.
  - *Tetrahydrocannabinol (THC)*: The primary psychoactive ingredient of cannabis, responsible for making people feel high.



Source: The National Conference of State Legislatures, June 2023

**“Over the years, I’ve had a lot of patients who’ve told me that cannabis helped alleviate their pain, and they wanted something other than opioids.”**

— DR. JULIA ARNSTEN

ReLeaf is assessing whether cannabis can reduce opioid use among patients with chronic pain.

But in a clever twist, each of ReLeaf’s 267 participants receives a voucher for purchasing one of four different oral cannabis extracts (including a placebo) at state dispensaries. This novel study design allows the researchers to randomly allocate specific formulations and still comply with regulations. After the participants have undergone 14 weeks of treatment, the researchers measure their cumulative opioid use, pain levels, mental health symptoms, and adverse events.

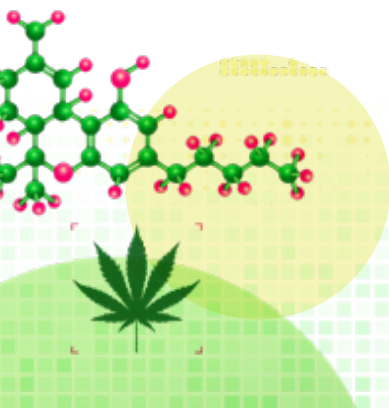
More typically in recent years, the NIH has favored research into the risks of cannabis rather than into its benefits. An analysis published in 2020 in *Science* found that the NIH’s National Institute of Drug Abuse—the biggest funder of cannabis research—spent more than

\$1 billion on cannabis studies between 2000 and 2018. More of those funds went to research into cannabis misuse and adverse effects than to studies of cannabis and cannabis-derived ingredients as therapeutic drugs.

### CONFRONTING A NEW HEALTHCARE DISPARITY

New York’s legalization of medical cannabis in 2016 didn’t guarantee access to the drug. In New York, as in most states, a person must first receive permission (referred to as “certification”) from a practitioner licensed to prescribe controlled substances.

The cost of getting certified (typically \$200) is not covered by health insurance, nor is the cost of the cannabis, which can amount to hundreds of dollars a month at a licensed dispensary and must be paid in cash.



# A User's Experience

Anyone who thinks medical-cannabis users are just looking to get high should talk to “Connie” (not her real name), a young woman from Rockland County, N.Y., who is a patient of Julia Arnsten, M.D.

Fourteen years ago, Connie crashed while riding an all-terrain vehicle, smashing a cervical vertebra and breaking her nose. The accident left her with chronic neck pain, periodic migraines, and debilitating anxiety. Physical therapy, yoga, weight training, and Botox injections offered some relief. But even though her symptoms persisted, she insisted on avoiding prescription painkillers.

“They make me sick,” she says. “And I grew up in a town where it seemed everyone was abusing oxycodone and getting hooked on heroin.” Instead, she began experimenting with street marijuana. Smoking weed provided modest relief, and she became a regular user.

Years later, Connie’s mom, then a Montefiore employee, told her about the medical center’s new medical-cannabis program, where patients can get counseling about the plant’s therapeutic uses and, if appropriate, a certificate for obtaining cannabis at licensed pharmacies. Connie got her certificate after consulting Dr. Arnsten, one of the program’s founders and chief of the division of general internal medicine at Einstein and Montefiore.

Medical cannabis eased Connie’s pain and migraines, significantly



**“I know some people think it leads to heavier drugs. But I can tell you it never made me want to do that.” — “CONNIE”**

improving her quality of life. “It also helped me relax and get a good night’s sleep,” she adds. She used the drug as she recovered from two operations without having to resort to conventional pain meds.

Connie soon realized that it was better to buy cannabis from a licensed provider than from a dealer. “When you’re buying it illegally, you don’t know what you’re getting, or what strains might be best for you. For example, I learned that sativa [one of the two main strains of cannabis] can actually trigger anxiety,” says Connie, who spends \$200 to \$300 a month on the drug.

Connie admits that medical

cannabis—which she smokes, vapes, or eats depending on her symptoms—can get her high if she takes too much. But that’s an unwanted side effect, not the goal. She makes a point of not taking cannabis before she goes to work or gets behind the wheel, just in case it impairs her faculties.

“I’m a big advocate of medical marijuana,” says Connie, now an administrative assistant at Montefiore. “I know some people think it leads to heavier drugs. But I can tell you it never made me want to do that. At most, it made me want to get hamburgers or pizza and sit down in front of the TV.”





## CANNABIS: FROM MENACE TO MEDICINE

**"There are many unsavory practitioners out there who certify patients but don't spend enough time counseling them about the different types of cannabis, the contraindications, and the risk of adverse events."**

— DR. JULIA ARNSTEN

"While these costs are affordable for many people, they're a burden for most of our patients," says Dr. Arnsten. This means that low-income patients are effectively blocked from obtaining medical cannabis through legal sources. Instead, many must turn to illegal, unregulated dispensaries, where costs are lower but quality and dosages are not controlled.

In 2017, Dr. Arnsten and her colleagues created the Montefiore Medical Cannabis Program (MMCP) to address this new healthcare disparity. The program—the first of its kind in an academic medical center—offers patients free certification to obtain cannabis at licensed pharmacies, along with advice and counseling.

"In academia, we usually wait for drugs to undergo safety and efficacy studies before enabling access to them," says Dr. Arnsten. "But there are many unsavory practitioners out there who certify patients but don't spend enough time counseling them about the different types of cannabis, the contraindications, and the risk of adverse events. The way that we're doing it is safer."

So far, more than 3,000 patients have participated in the MMCP. Most are seeking relief from chronic pain stemming from degenerative joint disease, inflammatory arthritis, HIV, sickle-cell anemia, fibromyalgia, or neuropathy.

Much more remains to be done to ensure equitable access to medical cannabis, says Dr. Arnsten. She estimates that half the patients certified by MMCP do not end up purchasing the drug at licensed dispensaries, largely because of the expense. Instead, many patronize unregulated dispensaries or continue using prescription opioids, since insurance copays reduce the cost.

"It's time to advocate for a new federal

## Medical Cannabis as Therapy

Einstein physicians Deepika Slawek, M.D., M.S., M.P.H., and Julia Arnsten, M.D., M.P.H., were the lead authors of *Therapeutic Use of Medical Cannabis in New York State*. The 28-page guideline was issued in 2022 by the New York State Department of Health AIDS Institute. "Ultimately, patients are using and want to use medical cannabis," the document says. "It is important to discuss it with them and to encourage safe use of medical cannabis as a harm reduction principle or when other treatment modalities have failed."

classification for cannabis so insurance companies can cover it, just as they cover the costs of drugs to treat cancer, diabetes, and other diseases," Dr. Arnsten recently wrote in *STAT*, an online healthcare publication.

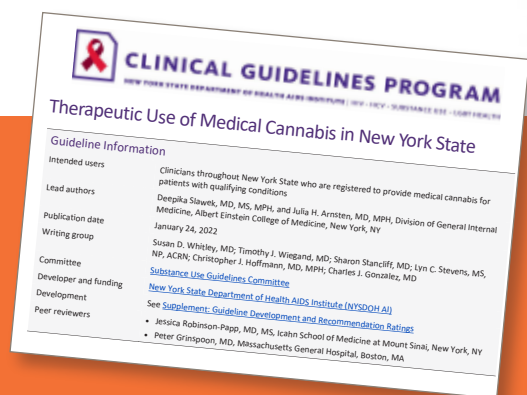
As of the summer of 2023, New York State had 40 dispensaries offering medical cannabis for sale, with just one in the Bronx. New York State approved cannabis for recreational use in 2021; 23 licensed and regulated dispensaries for selling recreational cannabis have opened so far, two of them in the Bronx.

## REVERSING CANNABIS IGNORANCE

The MMCP provides a reliable source of information about medical marijuana for residents of the Bronx and surrounding communities. But such expertise can be difficult to find elsewhere in the city and state.

Surveys have shown that most physicians nationwide have little practical





## The Purpose of This Guideline:

- Provide clinicians with a framework for implementing the therapeutic use of medical cannabis in their outpatient settings in New York.
- Increase access to evidence-based medical cannabis treatment for ambulatory patients in New York by increasing the number of clinicians who can provide that care in outpatient settings.

knowledge of medical cannabis, a topic rarely covered in medical schools or residency programs. In New York State, just 3 percent of physicians have registered as medical-cannabis providers.

It certainly doesn't help that some major professional organizations, such as the American Medical Association, still advise against using medical cannabis. Others, including the American Academy of Family Physicians, recommend a more-nuanced approach in which patients are carefully evaluated by appropriate providers. Adding to this muddle, federal authorities still classify cannabis as a schedule 1 substance—saying, in essence, that it's no more medically useful than cocaine or heroin, and just as dangerous.

To fill this information vacuum, the New York State Department of Health AIDS Institute crafted clinical guidelines for practitioners wishing to know more about medical marijuana. Published in

early 2022, *Therapeutic Use of Medical Cannabis in New York State* provides a comprehensive overview of cannabis pharmacology; the endocannabinoid system (see glossary on page 29); the therapeutic uses of cannabis; cannabis formulations; methods of administration, patient assessment, treatment initiation, patient monitoring; and side effects. The document is available online at [hivguidelines.org/substance-use/medical-cannabis/](http://hivguidelines.org/substance-use/medical-cannabis/). Its lead authors are Dr. Arnsten and Deepika Slawek, M.D., M.S., M.P.H., assistant professor of medicine at Einstein.

## CANNABIS FOR HIV-RELATED PAIN

Dr. Slawek, one of Dr. Arnsten's frequent collaborators, is evaluating cannabis for pain relief with a particular focus on HIV-associated neuropathy—nerve damage that can cause debilitating pain. Neuropathy is a common complication of HIV infection and often a cause of poor HIV outcomes.

"Unfortunately, there's a dearth of options for these patients, other than opioids and antiepileptic drugs—powerful medications with powerful side effects," says Dr. Slawek, whose work is funded by the NIH. In her pilot study, the first of its kind, 100 people with HIV will be randomized—using vouchers as in the ReLeaf study—to receive cannabis extracts with different ratios of tetrahydrocannabinol (THC) and cannabidiol (CBD), the plant's two best-understood and most-common active ingredients.

The study will assess how the extracts affect the patients' pain, inflammation, and HIV outcomes after 14 weeks of use. These measures may also provide insights into the little-known mechanisms by which cannabis promotes analgesia, or pain relief.



**"Unfortunately, there's a dearth of options for patients with HIV-associated neuropathy, other than opioids and antiepileptic drugs."**

— DR. DEEPIKA SLAWEK



## Old Medicine in a New Bottle

**2900 B.C.**

The Chinese emperor Fu Hsi describes Ma (the Chinese word for cannabis) as a popular medicine possessing both yin and yang.



**200 B.C.**

Cannabis is used in ancient Greece as a remedy for earache, edema, and inflammation.



**1611**

Jamestown settlers bring marijuana plants to North America.



**1850**

Cannabis is added to the U.S. Pharmacopeia as a treatment for numerous conditions, including alcoholism and opiate addiction.

**1911**

Massachusetts becomes the first state to restrict access to cannabis, requiring a doctor's Rx for purchases from licensed pharmacists. Many other states later enact similar laws.



**1930s**

Responding to a demand for cannabis-based drugs, pharmaceutical companies Eli Lilly and Parke-Davis sell standardized cannabis extracts for pain relief and other uses.

**1956**

Congress includes marijuana in the Narcotics Control Act. A first-offense marijuana possession carries a minimum sentence of 2–10 years with a fine of up to \$20,000.



**1970**

- NORML, the National Organization for the Reform of Marijuana Laws, is founded.
- President Nixon signs the Controlled Substances Act, classifying cannabis as a schedule 1 drug along with heroin and LSD.

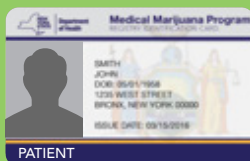


**1990**

National Institute of Mental Health re-researchers discover cannabinoid receptors present on neurons and some other cells.

**2014**

New York becomes the 23rd state to legalize medical cannabis. Conditions approved for use include cancer, HIV/AIDS, Parkinson's disease, and multiple sclerosis.



**2018**

The FDA approves the first cannabis-based drug, Epidiolex, an oral solution of CBD, for treating seizures associated with two rare and severe forms of epilepsy.



**2022**

President Joe Biden pardons thousands convicted of possessing cannabis.





## 1745–1775

George Washington grows hemp at Mount Vernon; his ledgers show he has a particular interest in the medicinal use of cannabis.



## SOOTHING A PAIN IN THE (HEAD AND) NECK

Curing head and neck cancer while preserving speech and swallowing usually requires radiation therapy combined with chemotherapy, which is associated with significant acute side effects. Patients may experience painful sore throats, difficulty swallowing, nausea, and loss of taste, all of which can conspire to decrease appetite and compromise nutrition.

Depending on the level of pain and discomfort, physicians usually prescribe medicated mouthwashes and narcotics, which can lead to problems of their own. The renewed interest in medical cannabis has prompted many oncologists, palliative-care specialists, and patients to ask whether cannabis might be a safer alternative for patients with head and neck cancer, and might also reduce opioid use.

“The short answer is that we need data,” says Rafi Kabarriti, M.D., associate professor of radiation oncology at Einstein and co-director of the NCI-designated Montefiore Einstein Comprehensive Cancer Center’s head and neck cancer team. “There are precious few data to guide us. What we can definitely say is that our patients should not be smoking or vaping cannabis or other substances, which can irritate the throat’s mucosal lining and make everything worse.”

Dr. Kabarriti and his colleagues are conducting a pilot study of 30 adults with head and neck cancer who have received certificates for obtaining different formulations of medical cannabis while undergoing chemotherapy and radiation therapy.

The study’s primary goal is to discover whether patients are able to use the certificates appropriately to obtain and adhere



**“Our patients should not be smoking or vaping cannabis or other substances, which can irritate the throat’s mucosal lining and make everything worse.”**

— DR. RAFI KABARRITI

## 1936

The movie that comes to be known as *Reefer Madness* debuts, warning of the evils of cannabis use.



## 1996

California becomes the first state to legalize medical marijuana. Since then, more than 40 states and the District of Columbia have done the same.



## 2023

Cannabis continues to remain illegal under federal law.





## CANNABIS: FROM MENACE TO MEDICINE

**Animal studies suggest that phytocannabinoids may be safer for the metabolism of children on the spectrum than other available treatments.**

to their cannabis regimens. Funded by Montefiore's department of radiation oncology, the study will also compare how the different cannabis formulations affect patients' quality of life, concurrent opiate use, oral microbiomes, appetite, nutritional habits, and weight loss. The researchers will also determine whether age, frailty, and prior use of cannabis influence outcomes.

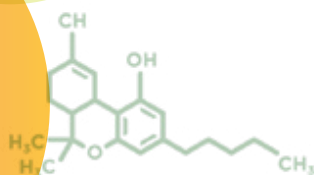
### A POSSIBLE TREATMENT FOR AUTISM

Children with autism spectrum disorder (ASD) often exhibit disruptive behaviors and irritability. Treatment for those problems is currently limited to risperidone or aripiprazole, potent drugs that are also prescribed for schizophrenia and

bipolar disorder. They can reduce many ASD symptoms—but at the cost of metabolic disorders such as obesity, motor issues, and other serious complications.

Animal studies suggest that phytocannabinoids (naturally occurring compounds in cannabis plants) may be safer for the metabolism of children on the spectrum than other available treatments, says Eric Hollander, M.D., professor of psychiatry and behavioral sciences and director of the autism and obsessive-compulsive spectrum program at Einstein and Montefiore.

In the first clinical trial of its kind, the U.S. Department of Defense is funding an investigation by Dr. Hollander and colleagues to determine whether a phytocannabinoid called cannabidivarin



(CBDV) can relieve ASD symptoms without causing harmful side effects. CBDV's molecular structure closely resembles that of CBD—a popular phytocannabinoid now being sold for conditions ranging from anger to Alzheimer's. CBD and CBDV are both psychoactive—meaning they can alter mood, perception, and behavior—but they don't produce a high.

The CBDV clinical trial (expected to be completed by August 2024) involves 100 children, ages 5 to 18, with ASD. They'll be randomized to receive CBDV or a placebo over 14 weeks. Dr. Hollander's team is also testing whether CBDV can help individuals with a rare form of autism called Prader-Willi syndrome (PWS), which shares many symptoms with ASD and includes the added complication of compulsive eating.

The body is awash in its own naturally occurring cannabinoids—the so-called endocannabinoids. They're involved in the endocannabinoid signaling system, which regulates bodily processes such as stress, mood, social behavior, and pain. The phytocannabinoid CBDV may help soothe ASD symptoms by normalizing endocannabinoid signaling.

"Studies show that individuals with ASD have higher-than-usual levels of circulating endocannabinoids, upsetting the excitation/inhibition balance in neurons by causing too much excitation and too little inhibition," Dr. Hollander says. "This imbalance can be expressed as meltdowns, aggression, and compulsive or repetitive behaviors."

Phytocannabinoids can bind to the same receptors as endocannabinoids and appear to restore the balance between excitation and inhibition in neurons. New research suggests that a key

component involved in exciting neurons is a lipid called LPI. It binds to a receptor on neurons called GPR55, triggering the release of excitatory neurotransmitters. By binding to and blocking LPI, both CBD and CBDV appear to inhibit the release of these neurotransmitters and thereby dampen neuronal activity.

"It turns out that CBDV is six times more effective at blocking LPI than CBD, which bodes well for our work," says Dr. Hollander. To explore this mechanism further, Dr. Hollander's team has launched a study that will measure how CBDV affects a wide range of metabolites, lipids, and endocannabinoids in patients with ASD and PWS.

In a clinical trial involving high-functioning adults with ASD, Dr. Hollander and colleagues are testing a "complex botanical"—a mix of phytocannabinoids plus a low dose of THC, the phytocannabinoid responsible for cannabis's high. "We're starting with adults rather than children, since adults will be better able to describe how the drug is affecting their anxiety, mental functioning, and motor coordination," says Dr. Hollander. "Also, THC can have negative effects on the developing brain. So it's better to see how the small amounts in our preparation affect key biomarkers in adults before we consider using it on children."

The challenge now, says Dr. Hollander, is for clinicians and researchers to keep pace with the social and legal acceptance of cannabis that has occurred in recent years. "Certainly the legislation permitting the use of cannabis is much further along when compared with how little we know about its potential benefits," he says. "There's a great need for more controlled clinical trials, both for efficacy and for safety." **E**



**"There's a great need for more controlled clinical trials, both for efficacy and for safety."**

—DR. ERIC HOLLANDER

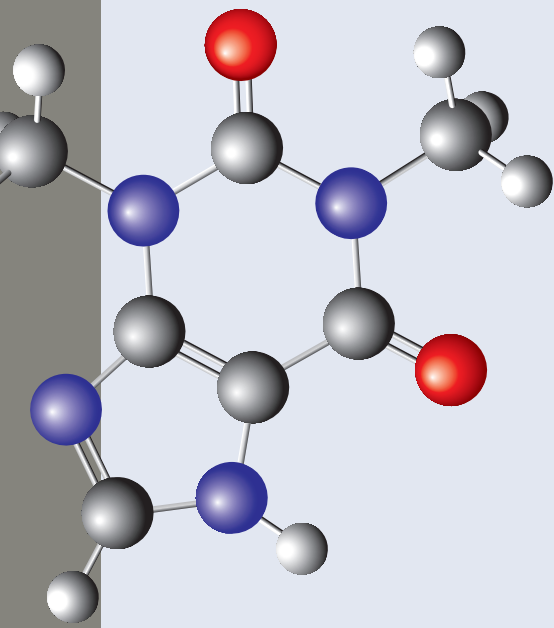




# Celebrating A SCIENTIFIC LIFE

Renowned molecular and developmental biologist  
Lucy Shapiro, Ph.D. '66, is still making groundbreaking discoveries

BY SUE BYRNE



**F**or Dr. Lucy Shapiro, director of the Beckman Center for Molecular and Genetic Medicine at the Stanford University School of Medicine, life has been a series of defining moments, all rooted in science. From the moment in college when she first saw a three-dimensional image of an organic molecule, she was hooked. “I have a photographic memory, and I can rotate things in space in my head,” she explains, “and I realized that organic chemistry is just beautiful.”

Dr. Shapiro received her doctorate in molecular biology at Einstein and became the College of Medicine’s first female chair of a department in 1977. She would later launch the field of systems biology at Stanford, advise two U.S. presidents on antibiotic resistance and bioterrorism threats, receive the National Medal of Science from President Barack Obama, and co-found biotech companies, among many other accomplishments. She attributes much of her success to the training she received at Einstein, which was “extraordinary, demanding, and rigorous, but always supportive.”

We caught up with Dr. Shapiro, who recently celebrated her 83rd birthday, to ask her about those defining moments and how they shaped her remarkable career.

**You went to the High School of Music and Art in Harlem to become a painter but ended up double majoring in fine arts and biology in college. Why biology?**

When I entered Brooklyn College, it had just started its honors program. Ten of us entering freshmen were chosen for the program, which meant that we didn't have any requirements. I did what I wanted, mostly art, and helped support myself in college by doing medical illustration. Biology was interesting and DNA was hot—it was the beginning of molecular biology, understanding the biochemical underpinnings of this new world that had started in 1953 with [James] Watson and [Francis] Crick's discovery of the double helix. So I also took biology courses but never stopped the art.

**How did you end up at Einstein?**

While I was still at Brooklyn College, I had a painting on exhibit at an art show and met a scientist, Theodore Shedlovsky [Ph.D.], who was there from Rockefeller University. He was a distinguished physical chemist and a violinist and would find young people in the arts who had potential and convince them to give science a chance. He urged me to take organic chemistry. I had no chemistry background but managed to enroll in Brooklyn College's honors organic chemistry course and got an A. That course was the beginning of the rest of my life—one of my defining moments.

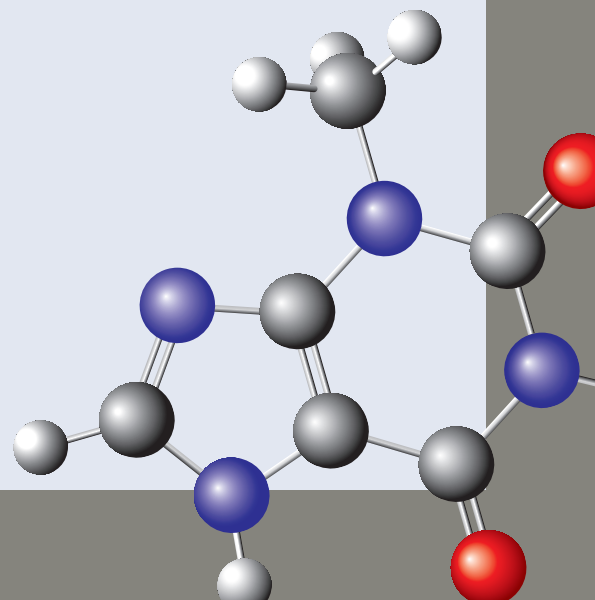
After I graduated, Dr. Shedlovsky encouraged me to get some experience in a lab. He sent me to Jerry Hurwitz and Tom August's lab in the department of microbiology at the New York University School of Medicine. They were studying DNA-dependent RNA polymerases. I



Courtesy of Lucy Shapiro, Ph.D.

**"I had no chemistry background but managed to enroll in Brooklyn College's honors organic chemistry course. It was the beginning of the rest of my life—one of my defining moments."**

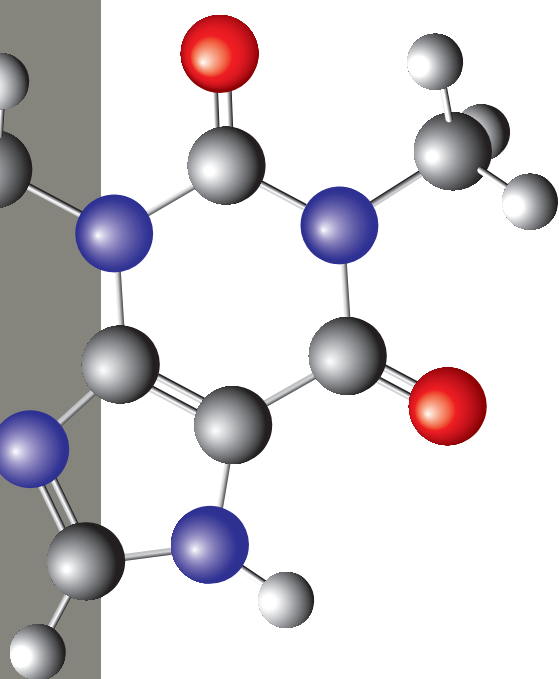
— DR. LUCY SHAPIRO



# Celebrating A SCIENTIFIC LIFE

**"The training I got at Einstein was demanding and rigorous; there was no question that we were taught to be the best in the world."**

— DR. LUCY SHAPIRO



knew how to make up a molar solution and so they hired me. It was a tough, male-oriented lab, and a lot was expected of us. This was the heyday of molecular biology discoveries, and we were a fulcrum with people coming from all over the world to visit the lab, so when I was offered the opportunity to pursue a Ph.D., I agreed.

The following year, the entire department moved to the Bronx and its new home at Einstein, reconstituted as the department of molecular biology. The training I got at Einstein was demanding and rigorous; there was no question that we were taught to be the best in the world. At that point in the evolution of molecular biology, we knew only about copying DNA to make RNA. Reverse transcription from RNA to DNA came much later. But in the mid-1960s, for my Ph.D. research at Einstein, I had studied the first RNA-containing phage [bacterial virus] to be identified. And I discovered that, in order to multiply, it used an RNA replicase—an enzyme that catalyzes RNA replication from an RNA template. In 2020, the SARS-CoV-2 virus RNA replicase was the prime villain in the COVID-19 pandemic that swept the world.

**After you'd spent six months in the lab of Julius Marmur, Ph.D., as a postdoctoral fellow, Einstein's chair of molecular biology, Bernard Horecker, Ph.D., asked you to return as a faculty member. He told you that you could work on whatever you liked.**

Yes, that was another defining moment. He said to me, "I want you to start a lab, but not for three months. First I want you to think and read and decide what important question is out there that you

would want to explore." Can you imagine a greater gift to a young scientist? That was unbelievable. So I came up with the idea of using the bacterium *Caulobacter crescentus* to address a key unanswered question in molecular biology.

## What was that?

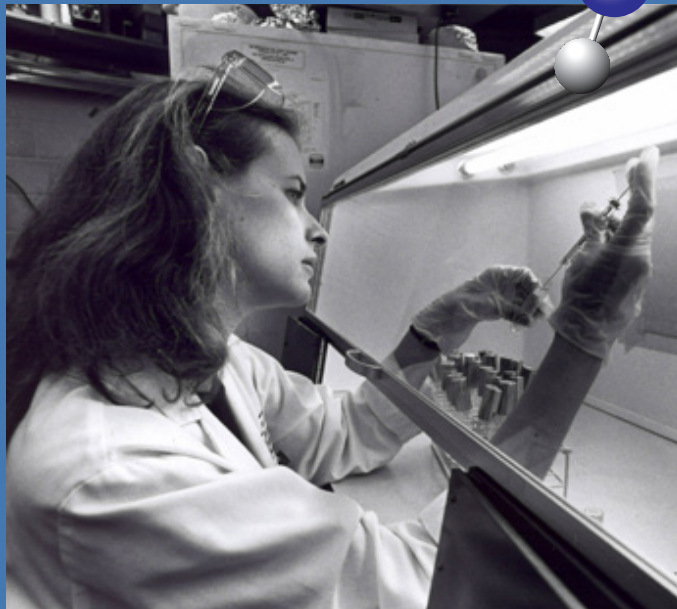
All cells exist in three dimensions, but where is the genetic code that tells them where to put things? Development and differentiation critically depend on asymmetric cell divisions that give you two different daughter cells. We didn't have a clue how that happens. So I decided to find the simplest system I could study. That was *Caulobacter crescentus*, a bacterium that yields two different cells with each division: a swimming cell with a flagellum and a nonmotile cell with a stalk to keep it in place.

And so began my work on *Caulobacter*, for which I've won many prizes, including my capstone award, the 2022 Linus Pauling Gold Medal from Stanford University.

**You were chair of departments at Einstein and then Columbia. How did you end up across the country at Stanford?**

I had been at Columbia for only three years when Stanford asked me to start a new department there. I kept saying no. But one day one of the most famous scientists at Stanford appeared at my office at Columbia, unannounced, with a dozen yellow roses. I went home and told my husband, Harley McAdams [Ph.D.], a physicist and a department head at Bell Labs at the time. And he looked at me and said, "How often does anyone get a job offer like you've





At left, Lucy Shapiro, Ph.D., in 1985, when she was director of the division of biological sciences at Einstein; above, at work in her lab in 1978 as a professor and chair of molecular biology here; and below, in 1974, examining a petri dish as an associate professor of molecular biology at Einstein.

## Career Highlights

- Discovered in the early 1960s that F2—the first known RNA-containing bacteriophage—uses an RNA-dependent RNA polymerase to copy its RNA genome, a finding that aided in the understanding of the virus that caused the COVID-19 pandemic nearly 60 years later.
- Established the bacterium *Caulobacter crescentus* as a vital model for developing the field of systems biology.
- Founded and chaired Stanford University's department of developmental biology.
- Co-founded the biotech companies Anacor (which developed the novel topical eczema treatment Eucrisa for children and adults) and Borgen (which merged with AgriMetis to form 5Metis, with the goal of developing promising compounds against agricultural fungal infections, including soybean blight and banana blight).
- Was awarded the National Medal of Science, sometimes referred to as "America's Nobel Prize," in 2011.

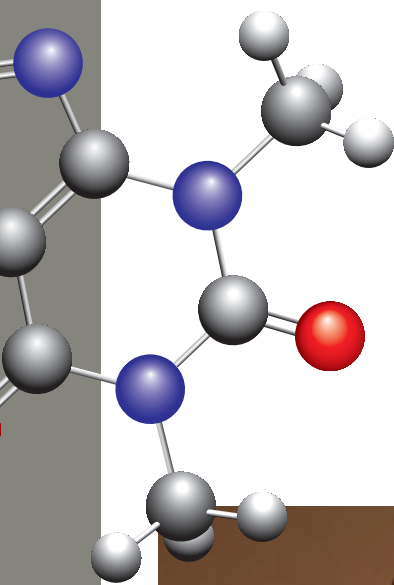


Courtesy of Lucy Shapiro, Ph.D.

# Celebrating A SCIENTIFIC LIFE

**"The constant breakthroughs that came out of that lab were because of the interdisciplinary nature of what we did."**

— DR. LUCY SHAPIRO



just gotten, to build a new department of developmental biology with a check for \$12 million to hire faculty? And how often does a woman get an offer like that? We're going." Not only did he become a Stanford professor of developmental biology, but we ended up integrating our separate labs.

## How did that work?

Harley's students were physicists and engineers; my students were biochemists, bacteriologists, geneticists, and cell biologists. And we each had our group of students and postdocs, but we then put them together. So a physicist would sit at the bench next to a geneticist, and an engineer would sit at a desk next to a cell biologist. It was really the beginning of interdisciplinary work at Stanford. And more and more labs started doing that. It was just a cauldron of discovery. We had group meetings every week. If one of my biochemists was giving a talk, an engineer had to understand what we were talking about. So we were teaching each other

each other's language. And the work that resulted was transformational. More and more labs at Stanford began doing that. I really believe that the constant breakthroughs that came out of that lab were because of the interdisciplinary nature of what we did.

**You've been a mentor to countless students at Stanford; 40 of your mentees are now leading *Caulobacter* labs of their own.**

## Why is mentoring so important?

Every time they have a success, it's my success. And every time they do something that's exciting, I can build on it. That's what science is like. When someone learns something, you say, "Oh, well, what can I do with that? What did that tell me that I didn't know before? What experiments can I do to expand upon that?"

## How did you come to serve as a scientific adviser to the White House?

In the early 1990s, I became very worried about the threats to the public posed by the increase in antibiotic resistance, emerging infectious diseases, and the possibility of bioterrorism. By then I was a member of the National Academy of Sciences, with a bully pulpit. I wanted to tell the people in power in Washington about my concerns—and did. I was invited to the White House to speak to President Bill Clinton and his Cabinet about antibiotic resistance. That led to serving as a scientific adviser to President Clinton and, during George W. Bush's presidency, as an adviser on bioterrorism to the secretary of homeland security, Tom Ridge, and to the secretary of state, Condoleezza Rice.

Courtesy of Lucy Shapiro, Ph.D.



Dr. Lucy Shapiro with her husband of 45 years, Stanford University physicist Harley McAdams, Ph.D., with whom she created Bio-X, Stanford University's interdisciplinary biosciences institute.



Dr. Lucy Shapiro with President Barack Obama in the East Room of the White House, where she was awarded the 2011 National Medal of Science.

**You and Stephen Benkovic, Ph.D., a chemist at Penn State, decided to design antibiotics and anti-fungals based on boron as their active site rather than carbon.**

#### **Why boron?**

We looked at the periodic table, and there was boron right below carbon. Steve is a visionary chemist, and it was curiosity that drove him to build new molecules as potential drugs. That's what science is all about. We were told, "Those compounds will be toxic—don't waste your time." But we tried it. Steve built a whole series of molecules centered on boron. He sent the compounds to me for testing, and several had incredible activity against specific bacterial and fungal pathogens.

When we replaced the boron in those compounds with carbon, we found that they lost all activity—proof that boron was key to their success as potential drugs. Stanford and Penn State, where Steve is a professor of chemistry, patented our compounds. Then Steve and I pulled whatever resources we had and obtained the exclusive license to these patents to form the company Anacor Pharmaceuticals,

focused on anti-infectives based on boron chemistry.

#### **What's your next venture?**

After selling Anacor to Pfizer, I turned my attention to the crop losses in developing countries due to fungal infections, one of the consequences of climate change. So in 2017, Steve and I formed the company Borgen with the goal of discovering boron-centered compounds to prevent fungal-caused crop blights. In 2021 Borgen became 5Metis, and one of our compounds, for eliminating a fungus that devastates bananas, is being evaluated in the equivalent of phase 3 trials in Nigeria, Uganda, and Brazil, and it appears highly promising. These compounds are also effective against other fungal diseases, including wheat rust, soybean blight, and the fungus that kills sorghum, a nutritious cereal grain that feeds half the world.

#### **Anything else you'd like to tell us about pursuing a career in science?**

Be confident. Be brave. And if you don't feel confident, act confident. **E**

## **Dr. Lucy Shapiro: Conversation Outtakes**

### **ON BEING A LEADER:**

Seventeen months after I was born, my sister was born with brain damage. My mother worked as a teacher, and there was no nanny. So at the age of 8 I was in charge of my sister. And believe me, it was not easy. But it went a very long way toward building confidence and building who I am today.

### **ON FINDING FEMALE ROLE MODELS:**

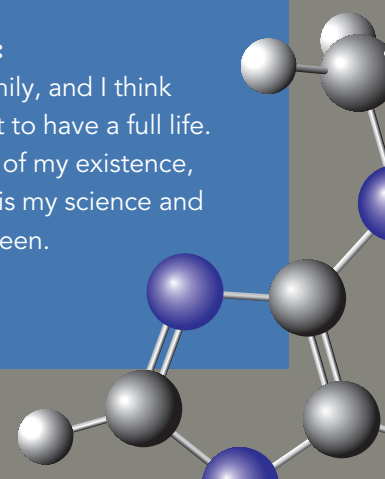
Einstein was always a remarkable place. In the '60s and '70s, there were more tenured—and extraordinary—female professors at Einstein than at any other school I know of, then or now.

### **ON BEING PREGNANT:**

When I defended my thesis at Einstein, I was three months pregnant, and nobody knew. During my oral exam, I kept running out to go to the bathroom. They thought I was nervous. I wasn't nervous—I was pregnant and throwing up. I had my son, Peter, on a Sunday morning, and two weeks later I was finishing my experiments.

### **ON FAMILY:**

I love my family, and I think it's important to have a full life. But the core of my existence, my passion, is my science and always has been.








# FIRE IN THE BRAIN

ILLUSTRATED BY TATYANA HARRIS





Even at low levels, neuroinflammation can have devastating consequences. Einstein researchers are working to quench the flames.

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BY GARY GOLDENBERG

Inflammation is a condition in which tissues become red-  
dened, swollen, hot, and often painful. It's what happens  
when the immune system defends the body against some  
sort of threat—when you develop a viral or bacterial in-  
fection, for example, or burn your hand. In fact, the immune  
system's arsenal includes pro-inflammatory signaling proteins  
such as cytokines, which encourage tissue inflammation as  
a way to trap and kill microbes and encourage the healing  
process.

But sometimes, even after a threat has disappeared, the  
immune response persists—and the resulting chronic inflam-  
mation can be devastating, especially to the brain.

Alzheimer's disease, Parkinson's disease, multiple sclerosis,  
Huntington's disease: research in recent years has shown that  
all these neurodegenerative brain diseases are fueled by chronic  
inflammation. Here we describe the work of several Einstein  
scientists who are studying different aspects of neuroinflam-  
mation with the goal of taming it to treat disease and perhaps  
preventing neuroinflammation from occurring.

## FIRE IN THE BRAIN



**"Even low-grade, chronic inflammation can lead to major metabolic problems, including obesity and diabetes."**

— DR. DONGSHENG CAI

### A Small Brain Structure With Big Responsibilities

For an object no bigger than an almond, the brain's hypothalamus plays an outsized role in regulating homeostasis—the coordination and regulation of many vital physiological processes so that they interact to maintain a stable, healthy state. Those processes include growth, development, body temperature, blood pressure, sleep, and energy balance (hunger and satiety).

*How Obesity Happens.* Stress placed on the hypothalamus can cause damaging inflammation that disrupts its grip on homeostasis and leads to metabolic problems. A key cause of that stress is nutrient overload—chronic overeating or consuming a high-fat diet. Dongsheng Cai, M.D., Ph.D., professor of molecular pharmacology, director of Einstein's Institute for Neuroimmunology and Inflammation, and the Young Men's Division Chair in Physiology, was the first researcher to show that hypothalamic inflammation due to overnutrition is a root cause of obesity and type 2 diabetes.

Overnutrition creates an abnormally rich mix of molecules in the peripheral bloodstream: not only high levels of saturated fats and glucose but also cytokines and other pro-inflammatory molecules released by the immune system in response to chronic nutrient overload. After crossing the blood-brain barrier (BBB) and becoming absorbed by brain tissue, these overnutrition-related molecules activate the NF- $\kappa$ B inflammatory signaling pathway inside cells of the hypothalamus.

"We know that even low-grade, chronic inflammation of hypothalamic

Stress placed on the brain's hypothalamus can cause damaging inflammation throughout the body.





Dongsheng Cai, M.D., Ph.D., at work in his Einstein lab.

neurons can lead to major metabolic problems, including obesity and diabetes as well as hypertension,” says Dr. Cai, who coined the term “hypothalamic microinflammation” to describe the physiological cause of those health problems and whose research is supported by the National Institutes of Health (NIH).

*Hypothalamic Inflammation and Aging.* Human studies have increasingly linked low-grade inflammation of the body with aging—“inflammaging,” for short. Dr. Cai suspected that inflammation of the hypothalamus might influence not only metabolic issues but also aging.

In a paper published in 2013 in *Nature*, Dr. Cai showed that—independent of diet—the NF-kB inflammatory pathway becomes active in hypothalamic cells when mice reach middle age and becomes increasingly active as the mice grow older; he and his colleagues were able to extend the life span of mice by suppressing the NF-kB pathway in the hypothalamus.

The researchers then determined how hypothalamic inflammation induces aging: by specifically destroying stem cells in the hypothalamus that replenish neurons. In that study, published in 2017 in *Nature*, he and


his colleagues generated mouse hypothalamic stem cells that were resistant to inflammation. The researchers showed that injecting the inflammation-resistant stem cells into the hypothalamus of middle-aged mice dramatically extended their life spans.

These findings indicate that inflammation of the hypothalamus plays a key role in aging and in controlling the life span. Moreover, suppressing or preventing hypothalamic inflammation might offer a strategy for combating age-related health problems and extending our lives.

*Assessing the Importance of Astrocytes.* When obesity- and aging-related substances in the bloodstream find their way to the hypothalamus, they appear to first enter astrocytes—cells that surround, support, and nourish hypothalamic neurons. Dr. Cai has shown that sustained exposure to these substances activates NF-kB inflammatory pathways in astrocytes of mice; eventually, this activation spreads from astrocytes to various inflammatory pathways in nearby neurons and to other cells of the hypothalamus.

In ongoing NIH-funded research, Dr. Cai is investigating how astrocytes are altered in response to pro-inflammatory signaling and how they “communicate” that inflammatory signaling to neurons—leading to metabolic dysregulation and, ultimately, to obesity and diabetes.

For another NIH-funded study, Dr. Cai is investigating how the link between astrocytes and neurons in the hypothalamus influences the development of obesity-related hypertension, which is responsible for about three-fourths of all cases of high blood pressure.



Growing evidence suggests that neuroinflammation causes the behavior changes in people who become depressed.

### Neuroinflammation's Role in Depression

What causes the behavior changes that occur in people who become depressed?

Growing evidence suggests that the answer is inflammation—the body's response to harmful stimuli. Einstein scientists Joan W. Berman, Ph.D., and Anjali Sharma, M.D., M.S., are multi-principal investigators participating in NIH-funded studies looking at neuroinflammation's role in causing depression in people with HIV (PWH). Vilma Gabbay, M.D., now an adjunct professor at Einstein, is also a multi-principal investigator on the two NIH grants discussed directly below.

*Neuroinflammation and Disruption of the Blood-Brain Barrier.* Depression is the most common neuropsychiatric illness among PWH and is estimated to affect nearly 40% of them. By 2030, the top two leading causes of disease burden globally are predicted to be HIV and depressive disorders. Despite these alarming statistics, there has been little research on the molecular mechanisms by which HIV infection may be causing depression.

Drs. Berman and Sharma are seeking the neurobiological mechanisms that may connect HIV infection with depression. Their study is enrolling 300 male and female participants—depressed PWH, nondepressed PWH, depressed HIV-negative people, and healthy controls—and it involves experts in psychiatry, neuroimaging, HIV, and immunology.

Dr. Berman is a professor of pathology and of microbiology & immunology and the Irving D. Karpas Chair in Medicine at Einstein, and co-director of the



Biomarkers and Advanced Technologies Core of the Einstein-Rockefeller-CUNY Center for AIDS Research (CFAR); Dr. Sharma is a professor of medicine at Einstein and an internist and infectious-disease physician at Montefiore, and co-chairs the HIV and Mental Health Scientific Working Group at CFAR.

The researchers hypothesize that systemic inflammation disrupts the blood-brain barrier, allowing HIV-infected blood cells called monocytes to cross the BBB and then release cytokines that inflame and alter the brain's reward circuitry and contribute to depression. If the researchers can confirm this chain of events, they may be able to develop therapies to ward off depression in PWH.

*The Neuroimmunology of Depression in PWH.* Dr. Sharma is a multi-principal investigator on a study involving PWH, with a focus on women living with HIV (WLWH). Such women are greatly affected by depression and yet are underrepresented in HIV research. Dr. Sharma and her colleagues hypothesize that WLWH are especially susceptible to neuroinflammation that affects the brain's reward circuits. Like the study of PWH, this study is enrolling 300 participants. Sixty percent of them are women.

The researchers believe that two key adverse events occur when the central nervous system becomes inflamed by HIV: chemicals called free radicals injure nerves of the central nervous system, and levels of gamma-aminobutyric acid—a neurotransmitter known to have a calming effect—are reduced. These neurochemical changes are believed to be involved in depression. The findings from this research may lead to strategies



Joan W. Berman, Ph.D., and M.D./Ph.D. student Caitlin Hills at work in the lab.



## FIRE IN THE BRAIN

for improving mental health as well as overall health in PWH.

### Focusing on NeuroAIDS

**A**ntiretroviral drugs have saved the lives of countless people with HIV. Yet these drugs can't completely eradicate the virus, leaving potentially dangerous reservoirs of HIV in various parts of the body, including the brain.

"These HIV reservoirs may not be actively replicating, but they're still shedding viral proteins," Dr. Berman explains. "That's a particular problem in

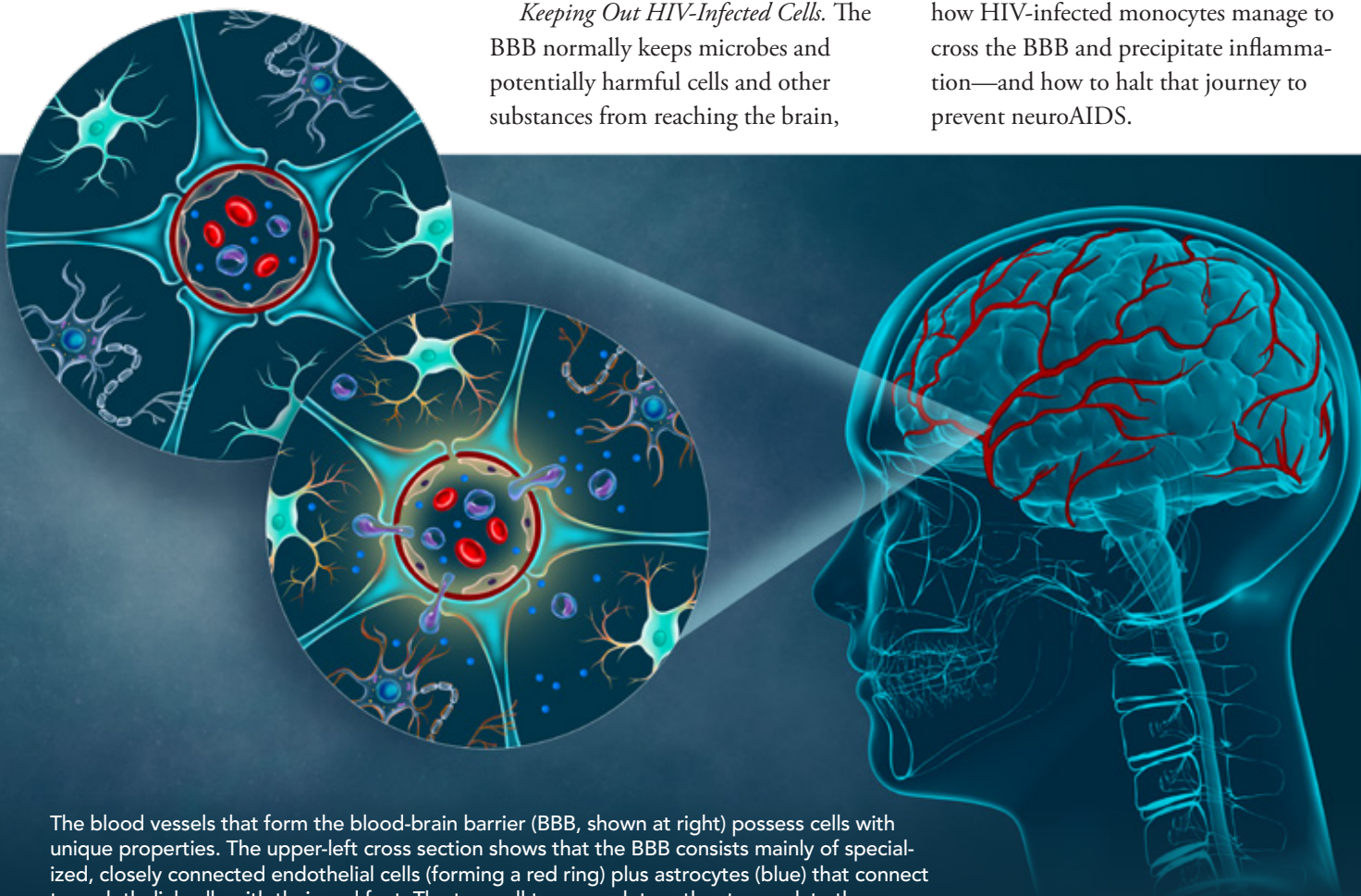
the brain, where the proteins are both toxic and inflammatory."

Dr. Berman believes that HIV protein shedding is partly responsible for neuroAIDS—a neuroinflammatory disorder that affects as many as 40% of people with HIV and involves cognitive impairments ranging from mild to severe (although, she says, dementia is less common in the era of antiretroviral drugs). Her research focuses on the blood-brain barrier—a tightly packed, semipermeable layer of endothelial cells that forms the inner surface of blood vessels inside the brain. She studies how alterations in its functions contribute to neuroinflammation and neuroAIDS.

*Keeping Out HIV-Infected Cells.* The BBB normally keeps microbes and potentially harmful cells and other substances from reaching the brain,

while letting through certain cells as well as water, oxygen, nutrients, and general anesthetics. Early in the course of HIV infections, however, HIV-infected immune cells called monocytes are able to cross the BBB, leading to the inflammatory damage to brain tissue that results in neuroAIDS. (See illustration below.)

About two decades ago, soon after starting her study of neuroAIDS, Dr. Berman developed a tissue-culture model of the human BBB. That model, which she has refined over the years, is now used by researchers in several dozen laboratories worldwide. In research funded by NIH grants, Dr. Berman is working with her BBB model to learn how HIV-infected monocytes manage to cross the BBB and precipitate inflammation—and how to halt that journey to prevent neuroAIDS.



The blood vessels that form the blood-brain barrier (BBB, shown at right) possess cells with unique properties. The upper-left cross section shows that the BBB consists mainly of specialized, closely connected endothelial cells (forming a red ring) plus astrocytes (blue) that connect to endothelial cells with their end feet. The two cell types work together to regulate the movement of molecules, ions, and cells between the blood and the brain. The serum of people with HIV may contain inflammatory proteins that damage the BBB (cross section at lower left), allowing HIV-infected monocytes to cross into brain tissue and contribute to neuroAIDS.

Ideally, the BBB should prevent HIV-infected monocytes from entering the brain while not impeding uninfected monocytes that the brain needs for maintaining immune surveillance. One of Dr. Berman's research challenges is determining how the two types of monocytes differ.

"We're looking for cell-surface proteins that are found only on HIV-infected monocytes and that may facilitate passage of infected cells across the BBB," says the researcher. "If we could selectively target those proteins with drugs or other therapeutic interventions, we might be able to slow the entry of infected monocytes into the brain. Similarly, we might be able to target inflammatory mediators in the serum of people with HIV that damage the BBB and help the infected monocytes cross into the brain."

#### *Cooling Off Neuroinflammation.*

Dr. Berman also has NIH grants to study people with substance-use disorders who have HIV—a group especially prone to cognitive impairment. Her studies show that both opioids and methamphetamine may worsen neuroAIDS by making the BBB more permeable, enabling HIV-infected monocytes to cross the BBB and cause tissue-damaging inflammation in the brain. Studies in her lab, and by her collaborators at the Icahn School of Medicine at Mount Sinai, suggest a possible therapy for the inflammation that fuels neuroAIDS: buprenorphine, a drug used to treat opioid-use disorder.

"We've found that buprenorphine is effective at reducing neuroinflammation," she explains. "We'd like to test whether it can reduce inflammation in people with HIV, regardless of whether they have substance-use disorders." **E**



## INFLAMMATION'S SILVER LINING

It turns out that brain inflammation isn't always bad. Do you remember the day you graduated from college? What you did on your last birthday? You can thank inflammatory signaling in certain brain neurons, says Jelena Radulovic, M.D., Ph.D., professor in the Dominick P. Purpura Department of Neuroscience, professor of psychiatry and behavioral sciences, the Sylvia and Robert S. Olnick Chair in Neuroscience, and co-director of the Psychiatry Research Institute at Montefiore Einstein.

Dr. Radulovic uses mice to study various aspects of the neurobiology of memory. Recently she has been investigating how neuroinflammation leads to episodic memories—long-term memories of personal experiences.

Neural circuits connecting two brain regions—the retrosplenial cortex and the hippocampus—are especially important for episodic memory. Dr. Radulovic is studying how inflammatory proteins (those involved in the NF- $\kappa$ B pathway as well as interferon and transforming growth factor beta) form memories in those circuits and enable them to persist. She is also investigating the cell-specific roles played by inflammation in allowing us to access memories throughout our lives.

Jelena Radulovic, M.D., Ph.D., above at right, works with lab technician Zorica Petrovic and postdoctoral researcher Hui Zhang.



PASSIONATE

# PURSUIITS

## Capturing Joy in Black and White

BY GINGER SKINNER



More than a decade ago, when Damien Jackson, M.Ed., first picked up a camera, he saw it as a way to bond with his children and chronicle their growth. “I’m happy that I found photography that way,” says Mr. Jackson, the assistant dean for student finance at Einstein. “Without it, I’m not sure how I’d express the things that feel important to me.”

Over the years, Mr. Jackson has gravitated toward images of Black fathers and their children to correct the stereotypical portrayals often put forth by mass media. “I use my camera to document that relationship and to tell our story,” he says.

Many of his photos are converted to black and white. “I believe black-and-white images help the viewer focus on the emotion of the scene and help me relay that emotion more effectively—the pain or the happiness,” he explains.

He draws inspiration from photojournalist Gordon Parks’s iconic images of Black American life in the mid-20th century. “His way of composing images, and his use of light and shadows to tell stories and evoke emotion, are brilliant and have greatly influenced how I approach photography,” he notes. “While color is beautiful, it can add noise and distraction to the image, in some ways muting the emotion.”

### CLOSER TO HIS ROOTS

These days Mr. Jackson has turned his lens toward another deeply personal project: a series of images of young men of color between the ages of 9 and 16, taken on islands in the Caribbean. “In these photos, young men are creating memories, diving and flipping off a wharf into the sea. It feels like a throwback to a simpler time before cellphones and gaming systems,” Mr. Jackson says. “I want to show Black people enjoying life, carefree and full of possibility.”

The project has brought Mr. Jackson, the son of immigrants from the islands of St. Vincent and the Grenadines, closer to his Caribbean roots. “There’s one image in the series of a young man jumping from high up into the water against the vastness of the ocean,” he says. “He’s communing with the water. Those moments of joy brought back memories of my dad and uncles talking about their times swimming around the island.”

Mr. Jackson, a self-described “latchkey kid,” says he rarely left his West Indian neighborhood in Brooklyn, N.Y., when he was growing up. But that changed as he got older. “I’m now comfortable being uncomfortable. I relish the feeling





Damien Jackson's photos, taken on the islands of St. Vincent and the Grenadines, in Atlanta, and in Brooklyn, represent his experience as a Black man growing up in America as the son of immigrants.

because it means I am learning something new—languages, cuisines, customs. There is no better feeling," Mr. Jackson says.

### BACK IN FOCUS

While the global COVID-19 pandemic temporarily prevented Mr. Jackson from traveling, it didn't stop him from working on another project that he hopes to turn into an immersive exhibit. It pertains

to the forced migration of thousands of people of St. Vincent (known as the Garifuna, or Black Caribs) by the British in the 18th century, their subsequent exile to Honduras and Belize, and their eventual migration to places such as the Bronx and Chicago. He plans to interview and photograph many of the descendants.

The uncertainty of the past three years has made him want to freeze moments in time for posterity. "The pandemic wiped out entire families," Mr. Jackson says. "I started to see how fragile life is. And if you're not able to chronicle life, it's gone forever."

To that end, Mr. Jackson is using his photography and videography skills to honor his grandmother, who turned 100 last year. "She is our matriarch, and it's important that I capture her essence so that all of her descendants have a clear picture of what Mary Floretta Ballantyne means to our family," Mr. Jackson says. "It's my hope to do the same for as many families as I possibly can. I think of it as a lifelong project." **E**



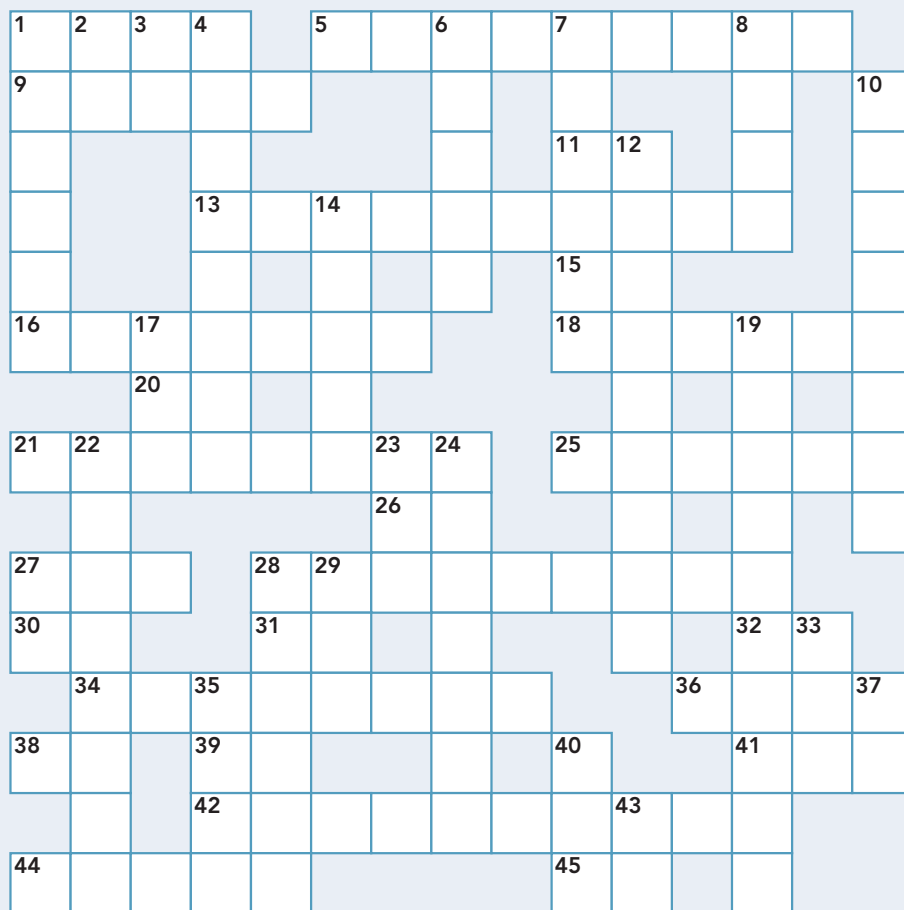
### VIEW MORE

Find more photos by Mr. Jackson: [magazine.einsteinmed.edu/photos23](https://magazine.einsteinmed.edu/photos23)

# ALBERT'S PUZZLER

BY DEIRDRE BRANLEY

## Flower Power



### Across

- 1 Part of the brain that connects to the spinal cord (4)
- 5 A common herbal supplement to treat or prevent colds (9)
- 9 Einstein's Susan Band Horwitz discovered the mechanism of action of this anticancer drug derived from the yew tree (5)
- 11 Slang for six-point score in American football (2)
- 13 A common plant-derived toothpaste flavor, also used to ease headaches (10)
- 15 For example, for short (2)
- 16 One of the most widely used drugs in the world, initially extracted from willow-tree bark (7)
- 18 A common root-derived ingredient in Asian cuisine that can also help ease nausea (6)
- 20 Degree for a nurse (2)
- 21 Spiky plant whose gel soothes burns (8)
- 25 A bulb used to season food and said to lower blood pressure (6)
- 26 Short for nuclear medicine (2)
- 27 Eggs, scientifically (3)
- 28 This flower is the main ingredient in Sleepytime® tea (9)
- 30 Email subject starter (2)
- 31 Scientific abbreviation for lithium (2)
- 32 A nurse with prescribing authority (2)

- 34 Tobacco-plant derivative that is a source of and treatment for addiction (8)
- 36 STAT (4)
- 38 A physician's degree (2)
- 39 Antonym prefix (2)
- 41 The "slippery" variety of this tree used by Native Americans in healing salves (3)
- 42 What atropine is derived from, or the title of a Stevie Nicks album (10)
- 44 Woody perennials that are sources for a number of medicines (5)
- 45 Cobalt, in brief (2)

### Down

- 1 The tissue forming the framework or matrix of an organ (6)
- 2 Thanks from a Brit (2)
- 3 Prefix for former (2)
- 4 Painkiller from the poppy flower (8)
- 6 A bee's natural antibacterial (5)
- 7 Spice associated with pumpkin pie that can aid digestion (6)
- 8 Most widely used homogeneous enzyme-labeled immunoassay, or to eject (4)
- 10 This root has been in cough drops for more than 3,500 years (8)
- 12 Arrhythmia drug derived from foxglove (9)
- 14 The Nobel is one (5)
- 17 Anti-con (3)
- 19 Root found effective in treating diarrhea (10)
- 22 Flower often used in aromatherapy because of its soothing fragrance (8)
- 23 Cellular messenger (3)
- 24 Naturally occurring powerful disinfectant, also used to revive people who have fainted (7)
- 27 Either's partner (2)
- 28 Genetic copies (6)
- 29 Short for heparin-induced thrombocytopenia (3)
- 33 Buddy (3)
- 35 More than square (4)
- 37 A.M.'s opposite (2)
- 40 What's up, \_\_\_? (3)
- 43 Nitric oxide, in brief (2)





# MOTIVATIONS

The Front Line of Philanthropy at Einstein and Montefiore



## IN THIS ISSUE

- 56 Women Funding Science
- 60 Bridging a Gap in Healthcare (pictured)
- 64 Class Notes
- 67 In Memoriam

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For web-exclusive content, visit: [magazine.einsteinmed.edu/motivations2023](https://magazine.einsteinmed.edu/motivations2023)



# Women FUNDING SCIENCE

**Spirit of Achievement  
Luncheon breaks records  
for supporting research**

BY JOE LEVINE



Women are leading a change in philanthropy.

According to recent research from the Women's Philanthropy Institute at Indiana University, they are harnessing their growing wealth and influence to create a more just, equitable, and healthy society. Women are giving to more philanthropies led by women, and they are treating recipient organizations as partners rather than as a means to an end.

"Now more than ever, women are influencing why and how research is funded," says Trudy Schlachter, co-president of Einstein's Women's Division. "We're marshaling our resources to create a community that reflects our unique perspectives and values."

A tradition of women funding science has deep roots at Einstein thanks to its Women's Division, which was founded before the first class enrolled in 1955. It brought together a group of influential New Yorkers who were inspired to help create a new medical school that would eliminate quotas for Jewish students and welcome all students regardless of race, religion, gender, or creed.

The Women's Division spearheaded an initial fundraising campaign for the school. Since then, under the banner of "women funding science," the group has raised more than \$100 million for Einstein—benefiting patients in virtually every major area of medicine, from prenatal studies to treatments for women's cancers to diabetes research.

"The Women's Division has supported Einstein since those earliest days, and has, quite literally, been foundational to the success of the college," said Gordon F. Tomaselli, M.D., the College of Medicine's outgoing Marilyn and Stanley M. Katz Dean, in May at the 68th Spirit of Achievement Luncheon. The luncheon is the signature fundraiser in the Women's Division's yearlong calendar of events, and this year it raised more than \$700,000—a record amount.

"We continue to support Einstein because we believe in its unique ability to translate discoveries in the lab into practice-changing treatments in the clinic," said Women's Division co-president Terri Goldberg at the event. "Today we are proud to stand with the

Einstein's Women's Division hosts the 68th Spirit of Achievement Luncheon in May at the Rainbow Room in Manhattan's Rockefeller Center.



faculty, researchers, and students who work together to advance equitable access to healthcare, education, and research.”

## PROMOTING NOVEL IDEAS

The Spirit of Achievement Luncheon has honored the groundbreaking work of women in various fields, from science to the silver screen to sports. Past honorees include Marlene Dietrich, Eleanor Roosevelt, Meryl Streep, Billie Jean King, Shirley Chisholm, Gloria Steinem, Diane von Furstenberg, and Leontyne Price.

This year’s honorees included Einstein trustee and Women’s Division board member Karen Mandelbaum and Marla Keller, M.D., professor of medicine and of obstetrics & gynecology and women’s health, vice chair for research in the department of medicine, and director of the Harold and Muriel Block Institute for Clinical and Translational Research at Einstein and Montefiore. (See next page for more on the other 2023 honorees.)

Mrs. Mandelbaum was recognized for what Ruth L. Gottesman, Ed.D., chair of Einstein’s Board of Trustees, termed “the remarkable breadth of [her] leadership in nurturing Einstein for more than 40 years.” The honoree and her husband, real estate developer David Mandelbaum, have generously funded research at Einstein and Einstein-Montefiore’s Center for Experimental Therapeutics. Mrs. Mandelbaum was the creator of and initial host for the Women’s Division’s Scientific Salon Series, at which leading Einstein and Montefiore researchers and clinicians discuss their work.

“I find it so special to be in the Women’s Division,” Mrs. Mandelbaum



Clockwise from top left: Einstein professor and Changemaker awardee Marla Keller, M.D.; Spirit honoree Karen Mandelbaum and her husband, David; and Women’s Division leaders, from left, luncheon co-chairs Andrea Stark and Betty Schwartz, co-president Trudy Schlacter, luncheon co-chair Carol Roaman, and co-president Terri Goldberg.

said. “I was there from the beginning and felt proud to be part of it. I love that we are women funding science.”

## RESEARCHER RECOGNIZED

Dr. Keller received the Women’s Division’s prestigious Changemaker Award, given annually to a scientist.

As head of the Block Institute, Dr. Keller—a renowned infectious-disease specialist—helps accelerate scientific discoveries from the lab and the clinic so that they become effective new treatments. The Block Institute supports projects to combat opioid-use disorder, HIV, obesity, asthma, rare diseases, and more. Dr. Keller has also created strategies to protect women from sexually transmitted diseases and served as a member of the National Institutes of Health’s (NIH) COVID-19 Treatment

Guidelines Panel. Under her leadership, the Block Institute was recently awarded a seven-year, \$30 million renewal of its NIH funding (see page 11).

Dr. Keller recalled attending the 54th Spirit of Achievement Luncheon in 2008, not long after she first arrived at Einstein. “Donny Deutsch was the host and Whoopi Goldberg was an honoree. But what I was truly most impressed with was the commitment by the Women’s Division to fund and inspire support for research that improves human health,” she said. “This dynamic group of women funding science has a goal similar to that of the Block Institute—to shorten the time it takes for scientific findings to improve and save lives.” She noted that the late Muriel Block, who, with her husband, Herbert, funded the creation of the

## MOTIVATIONS | PHILANTHROPY

Block Institute, was a member of the Women's Division.

Dr. Keller said that only 5% of some 10,000 known human diseases have a treatment or cure, while nine out of 10 drugs in clinical trials fail. The successes, she said, take from 10 to 15 years to reach the bedside, at an average cost of more than \$2 billion—numbers that underscore the continuing need for private philanthropy.

“What makes Einstein truly unique is its cutting-edge research, led by world-class investigators in an incredibly collaborative environment with supporters who believe in its mission to improve health in the Bronx and beyond,” Dr. Keller said. “With continued grant funding and philanthropic support, I’m confident Einstein researchers will be at the forefront of translating discoveries in the laboratory to clinical trials and approval of new drugs.”

### SINGER-SONGWRITER, PRODUCERS HONORED

Additional 2023 Spirit of Achievement honorees were singer-songwriter Judy Collins and Broadway producers Fran and Barry Weissler.

Ms. Collins came to prominence in the early 1960s Greenwich Village folk scene along with Bob Dylan, Joan Baez, and Tom Paxton. A longtime activist, she credited her social-justice roots to her father, a radio host who “advocated for the life one can have under all circumstances. Whether you’re a singer, a poet, or a scientist, if you pick a problem and do what you can do, you do achieve something,” Ms. Collins said at the luncheon, adding that “the role of women in research is very important because women actually know how to do things.” She closed with an a cappella



Spirit of Achievement honorees and Broadway producers Fran Weissler, left, and Barry Weissler with singer-songwriter Judy Collins.

rendition of her signature song “Both Sides Now.”

The Weisslers recounted their path in founding the National Artists Management Company and earning a reputation as visionaries for producing 34 Broadway hits, including *Waitress*, *Finding Neverland*, *Pippin*, *Chicago*, *Gypsy*, *My Fair Lady*, *La Cage aux Folles*, *Fiddler on the Roof*, and *Seussical*.

“It’s hard work and commitment, and that’s what you get at Einstein,” Barry Weissler said. “We have such respect for Einstein scientists and the women who support them,” Fran Weissler added, noting that the couple’s own success “pales in comparison to work being done at Einstein, where research is saving lives—the lives of our performers and the lives of our audience. Yours is really the true visionary work.” **E**



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# FAMILY MATTERS

## GIVING TO CANCER RESEARCH

### Janet and Marty Spatz

Since 2003, the Helen and Irving Spatz Foundation has provided funding for cancer research at Einstein. Now the foundation's directors, Janet and Marty Spatz, have decided to build on that legacy—and support the borough where they began their life together—with an estate gift to the College of Medicine. They are inaugural members of the Albert Einstein Legacy Society, which recognizes individuals who choose to advance Einstein's mission through gifts in their estate plans. To create a plan that best serves your philanthropic goals, contact Michael Divers, planned giving officer, at 718.430.2685 or [Einstein-MDivers@einsteinmed.edu](mailto:Einstein-MDivers@einsteinmed.edu).

**Why give to Einstein?** "We wanted to give something for cancer research. I Googled—to be honest—'cancer research.' Various things popped up and one was Einstein. And I said 'Oh boy, I know Einstein in the Bronx. They have a great reputation, with cutting-edge scientists.'"

**Why cancer research?** "My mother died of stomach cancer. My father had a cancer-related blood disease. Marty's mother died of lung cancer. Marty's sister had breast cancer. She eventually died of bladder cancer. I had breast cancer 25 years ago, and now I have it again."

**What makes Einstein special?** "One, it's in the Bronx, the place where we started our life together, and two, it has world-class researchers. I think the work they're doing is just wonderful, and that's what attracted me."

**What donating does:** "It makes me feel wonderful doing it. It really does. It gives me a lot of pleasure to know that I've given back."

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THE ALBERT EINSTEIN  
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SOCIETY



MOTIVATIONS | COMMUNITY HEALTH





# BRIDGING A GAP IN HEALTHCARE

Montefiore's new Community Health Worker Institute is training Bronx residents to help local patients gain access to vital resources

BY TERESA CARR

**D**amaris Flores, a community health worker (CHW) at Montefiore, is at the forefront of innovation in primary healthcare.

Some days she might help young Bronx families register for SNAP (Supplemental Nutrition Assistance Plan), a federal program that helps low-income Americans pay for groceries. Other days she might help a senior citizen find transportation to medical appointments or show a single mother how to use NYC Child Care Connect—a website that helps people access childcare resources in New York City. “It’s a little bit of everything,” says Ms. Flores. “That’s what I love. You just never know what you’re going to get.”

Ms. Flores, who was born at Montefiore and lives in the Bronx, was among the first people to become part of the Community Health Worker Institute (CHWI) at Montefiore.

Montefiore community health worker Damaris Flores meets with a Bronx resident to go over transportation options for medical appointments.

Established in 2021, CHWI recruits and trains local residents to connect with patients and help them access a wide range of available resources. It’s a relatively new role in this country—the national census listed CHW as an occupation for the first time in 2010—but for more than a century, people like Ms. Flores have been a vital part of health systems in other nations.

“At the institute we’re focusing on community health workers as a way to bridge the huge gap in our health system between clinical care and social services,” says CHWI’s director, Kevin Fiori, M.D., M.P.H., M.S., associate professor of pediatrics and of family and social medicine at Einstein and director of social determinants of health in the office of community and population health at Montefiore. “They bring a tremendous amount of local expertise that we don’t always have on the clinical team.”

## NARROWING DISPARITIES

In the United States, health outcomes vary dramatically depending on where you live. For example, people in the

South Bronx—the poorest urban congressional district in the United States—have some of the country’s highest rates of diabetes, heart disease, asthma, HIV/AIDS, and maternal and infant mortality. Lack of healthcare is just part of the problem.

“Research shows that access to quality healthcare explains only about 20% of health disparities,” says CHWI’s associate director, Renee Whiskey-LaLanne, M.P.H., who is a master certified health education specialist. “More than 50% of the difference stems from social determinants of health—non-medical factors that shape daily life, such as your built environment, your behaviors, your age, and your socioeconomic status,” she says.

In 2017, Dr. Fiori helped develop a 10-question screening tool to quickly assess patients’ unmet social needs. Screens of more than 150,000 patients between April 2018 and December 2022 revealed that nearly one in five had pressing concerns about housing, food, transportation, medical bills, or other factors that directly affected their health.

## MOTIVATIONS | COMMUNITY HEALTH

When Dr. Fiori introduced the screening tool, Montefiore had just a few CHWs dedicated to addressing patients' social needs—not nearly enough to help the 360,000 patients in its primary-care network. “Then COVID-19 hit,” he says. “And we went into emergency mode trying to figure out a better way to deal with the devastating clinical and economic consequences for the Bronx.”

That's when Dr. Fiori and his team reached out to Andrew Racine, M.D., Ph.D., system senior vice president and chief medical officer for Montefiore, executive director of Montefiore Medical Group, and professor of pediatrics at Einstein, to pitch an idea.

“Dr. Racine was immediately

receptive. We clearly needed to reimagine a workforce to provide the very best care for our Bronx families and more systematically address their social needs,” says Dr. Fiori. “And that's how the Community Health Worker Institute came to be.”

The initiative drew on Dr. Fiori's many years of developing CHW programs in West Africa. That experience allowed him to envision a program that not only optimizes patient care but also benefits the CHWs themselves through skills training and exposure to the medical system.

“It was a very different model from how we have traditionally thought about community health workers,” Dr. Racine says. “It was revolutionary.”

**“We clearly needed to reimagine a workforce to provide the very best care for our Bronx families and more systematically address their social needs.”**

— DR. KEVIN FIORI

Kevin Fiori, M.D., and Montefiore community health workers meet up outside a neighborhood clinic before beginning their appointments with Bronx patients.

Photo by Jason Torres





## IMPROVING OUTCOMES, SAVING ON COSTS

Seed funding for the institute has come from community groups, private donations, and nonprofit entities, including the Robin Hood Foundation, New York City's largest poverty-fighting organization, which has awarded grants to CHWI totaling \$3 million to date. Adena Hernandez, a senior program officer at Robin Hood, says that its partnership with CHWI is meant to improve people's health and break the cycle of poverty. "It's a community-centered, community-informed approach to supporting families at pivotal moments in their lives."

Current donor support will finance up to 28 CHWs through 2024. However, a team of 32 is required to cover Montefiore's primary-care network, obstetrics practices, HealthySteps program (for parents of infants and toddlers), and select pediatric services at the Children's Hospital at Montefiore. The goal is to make these roles reimbursable by health insurers. But first, Dr. Fiori and his colleagues must demonstrate the health impact and financial benefit of CHWs.

Studies involving small numbers of patients have shown that using CHWs results in better outcomes and reduces health costs. "Now the challenge is demonstrating those benefits in real-world settings involving hundreds of thousands of patients," says Dr. Fiori. To that end, he leads the Community Health Systems Lab at Einstein, whose interdisciplinary team of researchers, clinicians, and community partners supports and enhances CHWI operations by analyzing the data collected through the program. Their research will assess whether CHWs improve access to care

and health outcomes in the Bronx and reduce healthcare costs.

The goal is to expand the program over the next five years to cover most of Montefiore's patients, fully funded through federal and private entities. "It's just a good business decision," says Dr. Fiori. "For a small investment, we can bring down healthcare costs and improve health outcomes."

## INVESTING IN PEOPLE

As part of Montefiore's CHWI initiative, new hires spend a month in preservice training to learn how to interact with patients, the clinical team, and computer systems, as well as how to navigate social services. "It was the most intense training that I've ever had in preparation for employment," says Ms. Flores. "But we were all excited about our new roles."

The education goes both ways, says Ms. Whiskey-LaLanne. "What I love about that training period is that we often learn about changes to social services and benefits from the candidates themselves, who bring their lived experience to the job."

In addition to training, the institute is committed to advancing the careers of the CHWs. It provides paid time for them to earn up to nine hours of college credit at Hostos Community College. And once they complete 2,000 hours of on-the-job training and mentorship, CHWs receive apprenticeship certificates from the New York State Department of Labor.

In this way, CHWI helps build a sustainable workforce in the Bronx. "The institute not only creates jobs in the Bronx with good pay and benefits," says Marcos Crespo, senior



**"It was a very different model from how we have traditionally thought about community health workers. It was revolutionary."**

— DR. ANDREW RACINE

vice president of community affairs at Montefiore. "It's also making sure that professionals who come through the institute are trained and certified in this work, which expands and elevates their ability to grow economically."

Ms. Flores looks forward to developing professionally along with CHWI. She recently completed the requirements for her CHW apprenticeship certificate and has her sights set on a master's degree in public health.

She acknowledges that helping people with social needs can be emotionally draining, but she always takes a moment to reflect on the positives: "Every day I get to see firsthand the way this program has helped a family or individuals grow and get the supportive services that they need," she says. "It's amazing to contribute to that." **E**



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# CLASS NOTES

## 1960s

**Linn Turner, M.D. '61**, reports that she is thriving in sunny California, where she has a small practice and is enjoying life with her four children and five grandchildren. She swims at least a half a mile most days and keeps as active as she can.

**Mervyn Stein, M.D. '63**, retired in 2008 after practicing general ophthalmology for 38 years in Marin County, Calif. For the past 15 years, he has been engaged in golf, gardening, do-it-yourself home projects, travel (until COVID-19), drawing, and playing piano with several like-minded musicians. His daughter is a

lawyer living in Sacramento, Calif., and his son is an airplane investigator for the National Transportation Safety Board, living in Gig Harbor, Wash. Dr. Stein has two grandchildren.

**Sally E. Shaywitz, M.D. '66**, is the Audrey G. Ratner Professor in Learning Development at Yale University and co-founder and co-director of the Yale Center for Dyslexia & Creativity. She is the author of a bestselling book on dyslexia, *Overcoming Dyslexia* (Knopf, 2020). Dr. Shaywitz is an elected member of the National Academy of Medicine and the principal investigator of the Connecticut Longitudinal Study, continuously funded and now active in its 40th year. Most recently she presented to the U.S. Congressional Dyslexia Roundtable. Her goal is to help ensure that parents, educators, and physicians know about and use the tremendous scientific progress in dyslexia for the benefit of dyslexic children and their families. Her three sons are all physicians, and the eldest of

her six grandchildren is starting college in the fall.

**Richard Halford, M.D. '67**, has been working in Minneapolis doing hair transplants for Bosley. His daughter writes for the American Chemical Society, and his son is an anesthesiologist.

**Philip Herschenfeld, M.D. '68**, is still working as a psychoanalyst half-time and enjoys it very much. He says he and his wife love New York City. They have three children. One is a dermatologist in Boston, one is a builder in Brooklyn, and one is a stand-up comedian and actor. (You can see his album, *Thug Thug Jew*, on YouTube.) Dr. Herschenfeld has six grandkids ranging in age from 17 to 26.

## 1970s

**Harold Jawetz, M.D. '71**, is in remission from Hodgkin disease and doing well; he completed chemotherapy one year ago. He is looking forward to finally enjoying retirement (which he started just before his diagnosis was made). Dr. Jawetz says it has been three years since he has had the pleasure of going to Yankee Stadium.

**Miriam Tasini, M.D. '71**, has been retired for the past four years but continues to be active. She recently made a film about child survival during the Holocaust that was widely shown in the Northern California Jewish community. She has been widowed twice and has four granddaughters, one of whom has just graduated from the University of California, Los Angeles. Dr. Tasini sends love to all.

**Walter Orenstein, M.D. '72**, retired from Emory University, where he was



### Irwin R. Merkatz Women's Health Faculty Scholar Named

**Nadine T. Katz, M.D. '87**, professor of obstetrics & gynecology and women's health at Einstein, medical director of the Einstein campus, and vice president of Montefiore Medical Center, has been named the inaugural Irwin R. Merkatz, M.D., Women's Health Faculty Scholar at Einstein.

Dr. Katz, whose mentor is Dr. Merkatz, was recognized for her excellence as an educator and clinician at a May 17 ceremony. Dr. Merkatz is professor and chair emeritus of the department of obstetrics & gynecology and women's health and professor of pediatrics at Einstein.



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a professor of medicine, pediatrics, epidemiology, and global health, on Sept. 1, 2023. He has been an editor of *Plotkin's Vaccines*, the standard textbook in vaccinology, for the last six editions. The eighth edition was published in April 2023. Previously, he was the director of the national immunization program for 16 years at the Centers for Disease Control and Prevention.

**Steven Kussin, M.D. '74**, retired 30 years after founding his practice and then writing two books (Rowman & Littlefield) directed toward promoting patient education. He says he is now busy doing nothing; he is currently looking after too many homes and too few grandchildren (zero). Dr. Kussin reports that he and his sweetheart, Annie, have been together for 30 years now. He is looking forward to his 50th Einstein reunion.

**Maja Nowakowski, Ph.D. '74**, retired in 2022 after 44 years on the faculty at SUNY Downstate College of Medicine and School of Graduate Studies. Her research interests are lymphocyte-virus interactions, macrophage activation, and functions. She has twin sons (1973) and a daughter (1989), all born at Einstein. She also has six grandchildren, with a seventh on the way. Her mentors at Einstein, she notes, were Barry R. Bloom and Donald F. Summers.

**Richard W. Walker Jr., M.D. '74, M.B.A.**, is the chief executive officer and founder of Walker Health Care Holdings, Inc., and its four subsidiaries, which are healthcare companies focused on value-based care. The plan is for the firm to become national, serving the most-vulnerable patients, with the goal of achieving health equity through

community empowerment and value-based in-home healthcare. Dr. Walker has published three books, the most acclaimed being *Black Health Matters* (2021); his most recent is *What to Do About Your Troubled Child* (2022). Formerly an obstetrician and gynecologist in Houston, he retired from clinical practice in 2015.

**Robert Katz, M.D. '75**, retired from the practice of pathology and remains connected to medicine as president of the Morris Township (N.J.) board of health and as a member of the credentials committee at Morristown Medical Center. He maintains his longtime interest in Sherlock Holmes and has co-edited two books on medical aspects of the Sherlock Holmes stories.

**Neil White, M.D. '75**, is a professor of pediatrics and of medicine in the division of pediatric endocrinology and diabetes at the Washington University School of Medicine in St. Louis. He is the former director of the division and the pediatric clinical research unit and the associate director of the Center for Diabetes Translation Research at Washington University. Dr. White has worked on numerous National Institutes of Health-sponsored multicenter clinical trials related to type 1 and type 2 diabetes over the past 40 years. He and his wife, Ann, have two sons and four grandchildren.

**Kenneth Blank, Ph.D. '76**, was elected as a fellow of the National Academy of Inventors in 2015 and was recently appointed to the academy's board of directors.

**Andrew Dutka, M.D. '76**, retired from the full-time practice of neurology in

December 2021, after 21 years with the Mid-Atlantic Permanente Medical Group and, before that, 24 years in the Navy, and now enjoys two pensions. He says he completed the three-year accelerated medical school program available at Einstein at the time, and he has never regretted it. Dr. Dutka says that he is particularly interested in the whereabouts of classmates **Dave Carmichael, M.D. '76**, and **Ed Sausville, M.D., Ph.D. '79**.

**David Feldshon, M.D. '76**, has been a partner in MNGI Digestive Health in Minneapolis for 25 years. He and his wife just bought an apartment in New York, so they will be moving back after a lifetime of training and practicing—first in California, then Arizona, then California again, and then Minnesota. They have three daughters and three granddaughters. Dr. Feldshon's major interests are in liver disease and obesity medicine. He says he would love to hear from his classmates.

**Jerry Stern, M.D. '77**, says that after 20 years in academic/private practice at NYC Health + Hospitals/Bellevue, he has transitioned to industry, serving as the global head of medicine (virology and liver diseases) at the pharmaceutical company Boehringer Ingelheim. He “retired” from full-time work in 2016 and was a consultant for many early-stage biotech companies. Dr. Stern is currently the chief medical officer for Ischemix, leading research on cytoprotective drugs for various medical conditions whose needs remain unmet. He has been married to his wife, Robina, since his first day at Einstein. Dr. Stern's oldest granddaughter is now applying for medical school. His newest hobby is golf, and he says it's never too late to start.

**Jay B. Dobkin, M.D. '79**, associate professor of medicine in the pulmonary division at Einstein and a pulmonologist at Montefiore, was selected by Einstein faculty this year to receive the 2023 lifetime achievement award for excellence in teaching at the College of Medicine.

**Warren Heymann, M.D. '79**, was granted honorary membership for lifetime achievement in dermatology by the American Academy of Dermatology.

## 1980s

**Kenneth Davis, M.D. '80**, says that for the past two and a half years he has been working in the Edison, N.J., office of Plainfield Pediatrics, still doing what he loves—general pediatrics three and a half days a week, with no nights, weekends, or hospital rounds. He is still married to Ellen Radin, Barnard '78, Cardozo '82, and is a proud grandfather of “two perfect grandchildren.”

**Filippo Di Carmine, M.D. '83**, retired in December 2022 and has been traveling, but took time off from retirement to work in Guam for three months. He will celebrate his 40th wedding anniversary by spending time in Hawaii, and then return to New York to wait for the arrival of his first grandchild.

**Stuart L. Marcus, M.D., Ph.D. '83**, founded SonALAsense, Inc., in 2019 to develop a noninvasive, nontoxic, tumor-specific combination drug-device therapy for the treatment of glioblastoma and diffuse intrinsic pontine glioma. The Ivy Brain Tumor Center at the Barrow Neurological Institute in Phoenix ran the first clinical trial of sonodynamic therapy

in patients with recurrent glioblastomas. The first preliminary clinical report was published online in the *Journal of Neuro-Oncology* in April 2023. Go to [www.sonalasense.com](http://www.sonalasense.com) for more information.

**Dana Zweig, M.D. '83**, is starting her 21st year of solo private practice in family medicine on Cape Cod in Massachusetts. She is an assistant professor of family medicine at the Tufts University School of Medicine. She and her husband, Charlie, are celebrating 25 years of marriage. Their son graduated from high school in June and will be going to the Massachusetts College of Art and Design in Boston in the fall.

**Ron Alterman, M.D. '86**, is a professor of neurosurgery at Harvard Medical School and the chief of the division of neurosurgery at Beth Israel Deaconess Medical Center. He and his family live in Cambridge, Mass. Dr. Alterman and his wife, Jackie, are proud to announce that their daughter had a bat mitzvah in May, and that their son is engaged to be married next January. Despite having lived in the Boston area for more than a decade, Dr. Alterman remains a die-hard Yankee fan.

**Felise Milan, M.D. '88**, and her husband, **Mark Polisar, M.D. '88**, live in Irvington, N.Y. Dr. Milan is the director of the Ruth L. Gottesman Clinical Skills Center at Einstein and the director of the introduction to clinical medicine program for preclerkship medical students. She also sees patients at an internal-medicine residency clinic once a week. Dr. Polisar sees family medicine patients at Montefiore Medical Group's Williamsbridge site. Their oldest child is an assistant rabbi for a reform

congregation in Cherry Hill, N.J. Their middle child is a computer engineer and data analyst for the dating app Hinge. Their youngest is a working actor/dancer/singer.

## 1990s

**Marc Levitt, M.D. '93**, is the chief of the division of colorectal and pelvic reconstruction at Children's National Hospital in Washington, D.C., a program that integrates surgery, urology, gynecology, and gastroenterology in the care of children with complex colorectal and pelvic disorders. He is a professor of surgery and pediatrics at the George Washington University School of Medicine and Health Sciences. Dr. Levitt lives in Washington, D.C., with his wife, Shary, whom he married during his fourth year at Einstein; they have three grown children.

**Peter Shaw, M.D. '94**, moved to Milwaukee, Wis., in 2022 to become the medical director of pediatric hematology/oncology/blood and marrow transplant at Children's Wisconsin/Medical College of Wisconsin. He has two sons in college, and a daughter in high school who aspires to become a doctor. Dr. Shaw says that his wife, Randi, is “amazing” and remains supportive and patient.

## 2000s


**Saryna P. Young, M.D. '03**, has started an independent dermatology practice in Stamford, Conn., called Young Skin. She says she enjoys seeing all generations of a family, and the experience is bringing back the joy of practicing medicine.


**Gary Schwartz, M.D. '06**, was named



## Stay in Touch

Keep your classmates up to date by submitting your news to *Einstein* magazine. We look forward to including you.

 **einsteinalumni@einsteinmed.edu**

 **Albert Einstein College of Medicine Alumni Association**

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the chief of thoracic surgery at Baylor University Medical Center in Dallas, Texas. He serves as the surgical director of lung transplantation and the director of extracorporeal membrane oxygenation. Dr. Schwartz is a clinical associate professor of surgery at Texas A&M School of Medicine.

**Noe D. Romo, M.D. '08**, M.Sc., assistant professor of pediatrics at Einstein

and medical director of the pediatrics inpatient service at NYC Health + Hospitals/Jacobi, was selected by Einstein medical students to receive the 2023 Samuel M. Rosen Award for Outstanding Clinical Teaching.

## 2010s

**Caitlin McMullen, M.D. '10**, has been at the Moffitt Cancer Center in Tampa, Fla., as a head-and-neck surgical oncologist/reconstructive surgeon since 2017. She has two children, ages 4 and 1. Dr. McMullen encourages her classmates to reach out to her if they're visiting Tampa.

**Leon Siegel, M.D. '17**, completed his general-surgery training at SUNY Downstate Medical Center in June. He is now pursuing further specialization as the bariatric surgery fellow at the University of Iowa, which is the home of Edward Mason, M.D., the father of the

gastric bypass and of vertical banded gastroplasty. Dr. Siegel and his wife, Shayna, have one son.

**Samima Habbas, M.D. '18**, completed an endocrinology fellowship at the University of Maryland and is returning to New York to work at Mount Sinai South Nassau in endocrinology.

**Dayle Hodge, M.D., Ph.D. '19**, and his wife, **Chelsea McGuire, M.D. '15**, are happy to announce the birth of their daughter, Amari, in October 2022.

**Heidy Wang, M.D. '19**, married fellow Einstein classmate **Henry Yang, M.D. '19**, in 2022. She is currently a pediatric infectious-diseases fellow at NYU Langone Health, and he is finishing his neurology residency at Montefiore Medical Center. He will then go on to an epilepsy fellowship at the same institution.

## IN MEMORIAM

**Frederic Joshua Barnett, M.D. '61**, age 88, U.S. Army physician, graduate of Harvard Law School, partner in F. Lee Bailey's Boston law firm, who returned to medicine, trained in neuroradiology, and finished his medical career of more than 35 years at the University of Pennsylvania's Presbyterian Hospital, March 23, 2023, Philadelphia.

**Lawrence Blacher, M.D. '78**, age 70, cardiologist in Miami, Fla., for more than 40 years, March 8, 2023, Miami.

**Eugene Paul Fazzini, M.D. '61**, age 84, chief of surgical pathology at Bellevue/ NYU for many years and director of the laboratory and of pathology at Somerset Medical Center in Somerville, N.J., July 13, 2023, Morristown, N.J.

**Paul E. Gorrin, M.D. '68**, age 80, internist and medical director at the Stockley Center in Georgetown, Del., until his retirement in 2012, May 27, 2023, Milford, Del.

**Margaret Anne Keller, M.D. '72**, age 75, retired professor of pediatrics and former chief of the divisions of pediatric infectious diseases and immunology at Harbor-UCLA Medical Center, Los Angeles, known internationally for her contributions to the understanding of pediatric HIV infection, May 17, 2023, Los Angeles, Calif.

**Stephen H. Lewis Jr., M.D. '64**, age 86, pediatrician at Greenwich Pediatrics in Greenwich, Conn., for 41 years, June 27, 2023, Rye, N.Y.

**Jeffrey Pollard, Ph.D.**, age 73, professor emeritus of developmental and molecular biology at Einstein, whose career will leave a lasting impact in the field of women's reproductive health

and cancer immunology, May 1, 2023, Edinburgh, Scotland.

**Arnold Ratner, M.D. '59**, age 89, dermatologist, May 20, 2023, Vienna, Va.

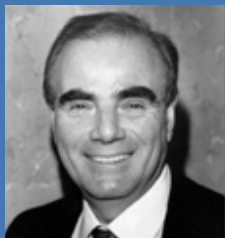
**Klaus Schreiber, M.D.**, age 85, professor emeritus of pathology at Einstein, who trained countless cytology fellows and pathology residents over several decades at Montefiore, April 28, 2023, Tuxedo Park, N.Y.

**Charles Smith**, age 64, retired chief of the genetics department kitchen and Einstein employee for more than 40 years, June 10, 2023, Bronx, N.Y.

**Myles G. Turtz, M.D. '61**, age 93, otolaryngologist and former president and chief executive officer of St. Christopher's Hospital for Children in Philadelphia, who helped establish its pediatric liver and heart transplant program and burn center, April 7, 2023, Cherry Hill, N.J.

## MOTIVATIONS | IN MEMORIAM

### Einstein Trustee Arnold S. Penner



**Arnold S. Penner,** longtime Einstein Board of Trustees member and great friend to the College of

Medicine, died July 25, 2023, at age 87.

Mr. Penner joined the Einstein Board in 1998. He served on the Board's executive committee as well as on the executive board of Einstein's Men's Division, now known as the Professional & Leadership Division. Together with his wife, Madaleine Berley, he established the Arnold S. Penner & Madaleine Berley Scholarship in honor of Stephen Lazar, Ed.D.; the Arnold S. Penner and Madaleine Berley Endowed Scholarship in honor of Arthur

W. Menken, M.D. '69; and the Arnold Penner & Madaleine Berley International Health Fellowship in honor of David Hirsh, M.D.

They also instituted the Arnold and Madaleine Penner Annual Musculoskeletal Repair and Regeneration Symposium, endowed the Arnold S. and Madaleine Penner Professorship within the department of orthopaedic surgery, supported the work of the Children's Evaluation and Rehabilitation Center, and were leading donors to the renovation of the Van Etten Building.

Mr. Penner's dedicated commitment to Einstein and his leadership were recognized with the Albert Einstein Humanitarian Award in 1992. Yeshiva University bestowed on him an honorary

doctorate of humane letters in 2006, and in 2011 he was honored alongside fellow trustee Linda Altman as an inaugural recipient of the Einstein Lifetime Leadership Award for his extraordinary contributions to Einstein's mission. Upon receiving the Lifetime Leadership Award, he commented, "If you are not philanthropic, you are not fulfilled."

Mr. Penner grew up in the Bronx, the son of a welder and a milliner. He began his lifelong career in real estate as a leasing broker in 1962. In 1980, he began investing in real estate independently, soon amassing a diverse portfolio of properties. He was also a part owner of longtime Manhattan landmark P. J. Clarke's. He is survived by his wife, Madaleine, and their children.

### Pioneering Scientist Fernando Macian-Juan



**Fernando Macian-Juan, M.D., Ph.D.,** age 56, professor of pathology and member of the Institute for Aging Research at Einstein and of

the Montefiore Einstein Comprehensive Cancer Center, died May 22, 2023, after battling a long illness.

During his 22 years at the College of Medicine, Dr. Macian-Juan was also the associate director of the Medical Scientist Training Program and a pioneering scientist in the fields of immunology, cancer, and aging research. A beloved mentor and colleague known for his warmth, collegiality, and commitment to training future physician-scientists and researchers, he

was selected in 2008 by Einstein Ph.D. students to receive the LaDonne H. Schulman Teaching Award.

He was elected to Einstein's Leo M. Davidoff Society, which recognizes excellence in teaching medical students. He and his lab team sought to understand the immune dysfunction that occurs with aging, particularly in cancer, with the goal of identifying drug therapies.

Active in many societies, Dr. Macian-Juan was an elected member of the American Association of Immunologists, the American Association of University Pathologists, the American Aging Association, and the American Society for Microbiology.

Born in Valencia, Spain, he received his M.D. and Ph.D. degrees from the University of Valencia, where he and Ana Maria Cuervo met when they were

17 years old, during their first year of medical school. The couple, who later married, conducted research in collaborative laboratories. After earning their M.D./Ph.D.s, Drs. Macian-Juan and Cuervo moved to Boston to complete their postdoctoral work. Dr. Macian-Juan continued at Harvard Medical School but then joined the Einstein faculty in 2003, two years after Dr. Cuervo had done so.

Dr. Macian-Juan is survived by his wife, Dr. Cuervo, professor of developmental and molecular biology and of medicine and co-director of the Institute for Aging Research at Einstein.



#### TO DONATE

The Fernando Macian-Juan Memorial Fund supports excellence in graduate-student mentoring. To contribute, go to: [einsteinmed.edu/giving/fernando-macian-juan](https://einsteinmed.edu/giving/fernando-macian-juan)



## A LOOK BACK



Albert Einstein College of Medicine Archives

### A Famous Name for a New Medical School

Seventy years ago the world's foremost physicist gave his name to a graduate school of Yeshiva University. That school—Albert Einstein College of Medicine—would become the first medical school to be built in New York City in more than half a century. In the photo above from March 1953, Albert Einstein, Ph.D., is pictured with Yeshiva's president, Samuel Belkin, Ph.D., far left, and Michael Nisselson, second from left, Einstein's director of development. In the fall of 1953, after ground was broken for the new college, Dr. Einstein wrote a letter to Dr. Belkin, stating that the medical college "will be unique in that, while it will bear the imprint of a Jewish university devoted to the Arts and Sciences and will represent a collective effort by our people to make its contribution in the field of medical science, it will welcome students of all races and creeds."



Albert Einstein College of Medicine

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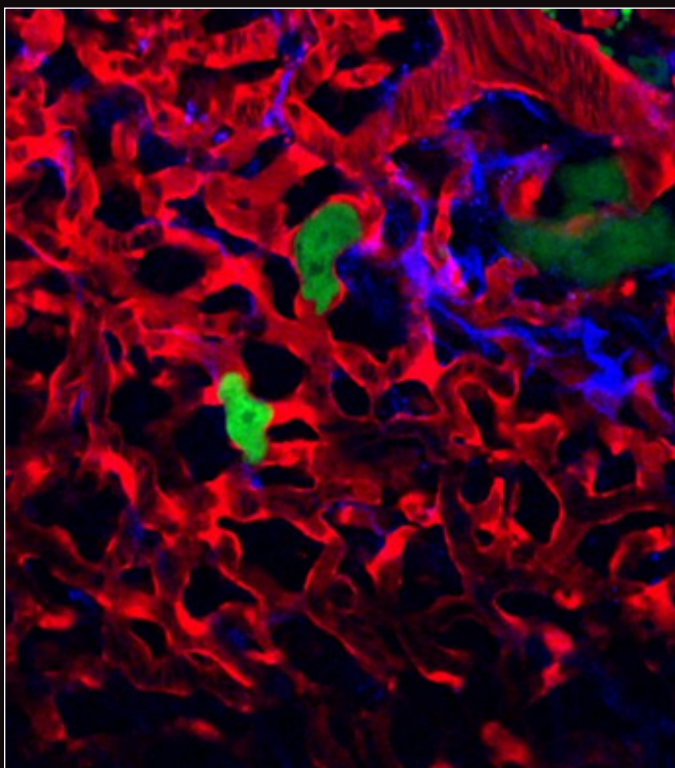


Image courtesy of David Entenberg, Ph.D., co-corresponding author of the *Nature Reviews Cancer* paper, associate professor of pathology, and co-director of the Gruss Lipper Biophotonics Center.

## EINSTEIN IMAGE

Some two-thirds of cancer deaths result from metastasis—when cells break away from a primary cancer and travel via the bloodstream to form new tumors in other parts of the body. Researchers in Einstein's Gruss Lipper Biophotonics Center have pioneered the use of intravital imaging (IVI) to better understand how metastasis progresses and to develop novel therapies to halt it. As the researchers describe in the January 2023 issue of *Nature Reviews Cancer*, IVI can generate real-time subcellular-resolution images of single slices of intact tissues in live animals for several weeks; combining IVI with multiphoton microscopy and an implanted window enables internal organs to be viewed. At the center of this image of a live mouse lung are two tumor cells (green) from a breast tumor that have metastasized to the vessels (red) of the mouse's lung. To their right is a cluster of growing tumor cells (also green) that have extravasated (exited the vasculature and entered lung tissue). Small green dots at the extreme top right are fragments of dead or dying tumor cells. Blue areas in the image are collagen fibers.