Lighting Up Cells, Curing Diseases
On the cover:
Research Fellow Timothée Lionnet, Ph.D., works on a microscope that he helped to develop in Einstein's Gruss-Lipper Biophotonics Center Innovation Laboratory. The image on the screen shows living cells in which molecules were “lit up” by photoactivatable fluorescent proteins. Fluorescent proteins have opened up a new world, allowing scientists to tag and observe molecules as they carry out their functions in living cells. Since glitches in molecular activity underlie all diseases, insights gained through use of these glowing proteins may lead to better treatments or even cures.
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The theme that unites the diverse stories in this issue of Einstein is collaboration—literally, “working together.” The cover article, “Lighting Up the Cell,” describes the collaborative work of protein chemist Vlad Verkhusha and structural biologist Steve Almo. By manipulating the structure of naturally fluorescent proteins, they are able to craft novel and powerful tools that enable their cell biologist colleagues to probe fundamental cellular processes in ways never before possible.

Another article, “Einstein’s Dynamic Duo of the Decade,” describes the 10-year partnership between Arturo Casadevall, chair of microbiology & immunology, and Kate Dadachova of the department of nuclear medicine. This article reveals the key to successful collaboration: complementary talents let team members achieve much more than would be possible if each worked alone.

Collaboration also prevails in “Einstein, AIDS and Africa.” This article describes two Einstein teams working to enhance their Rwandan and South African colleagues’ understanding of the HIV/AIDS epidemic so they can use that knowledge to help HIV-positive men, women and children.

Collaboration is also key to our recently updated strategic research plan, described in the news item “Tweaking Einstein’s Research Future.” If we are to solve the most intractable problems in disease treatment and prevention, basic scientists must work closely with clinicians. For this reason, the updated research plan emphasizes examining ways to enhance collaborative research with Montefiore Medical Center, the University Hospital and Academic Medical Center for Einstein.

Finally, some of our greatest collaborators don’t wear a white coat or work in a laboratory, but their support is crucial to our work. I’m referring to the thousands of donors who make philanthropic investments in Einstein each year. You’ll read about some of them in this issue. As always, we are extremely grateful for their (and your) generosity and interest.
Support from the Start
“Growing Up Healthy: How Einstein Is Helping City Kids,” the lead story of the Winter/Spring issue of Einstein magazine, provides a very nice description of our Healthy Steps program for first-time mothers and their infants. Our little patient looks just perfect on the cover—pointing toward the future, but a little nervous about the whole thing, too!

Rahil D. Briggs, Psy.D.
Director, Healthy Steps at Montefiore Albert Einstein College of Medicine
Bronx, NY

Einstein’s Global Reach
I am writing to tell you how much I enjoyed the Winter/Spring 2010 issue of Einstein magazine. Everything about it was spectacular: the content, the way it was presented and the photos. In spite of my busy day, I sat down and read it cover to cover, and found it all relevant and interesting. Having worked for the last decade in Rwanda, I especially liked reading “Uganda Diary,” which describes the very important efforts of my Einstein colleagues in improving diabetes care in that African country through training and education.

Thanks for a great issue, and keep up the good work.

Kathryn Anastos, M.D.
Professor of Medicine and of Epidemiology & Population Health
Montefiore Medical Center and Albert Einstein College of Medicine
Bronx, NY

A Look Back at Cardiovascular Research
The Winter/Spring 2010 edition of Einstein magazine is a terrific publication. Congratulations. The piece about the new Wilf Cardiovascular Institute and its director, Richard Kitsis, M.D., refers to Ed Sonnenblick. In my view, Ed was one of the most important cardiovascular investigators of the 20th century. We sorely miss him and his insights.

The history of cardiovascular research at Einstein might also mention that I brought my University of Pittsburgh Cardiac Metabolism Lab to Montefiore in 1972—one of the first in the nation to integrate cardiac biochemistry, metabolism and physiology in the same models.

The NIH Cardiovascular Research Fellowship grant funded in 1975, for which I was principal investigator, was an important addition. This Einstein-based grant exemplified my strategy for nearly 40 years in the Bronx of promoting seamless communication in academic issues between Montefiore and Einstein.

The collaboration of our laboratory with the Sonnenblick group was key to the funding of our program project grant, for which Dr. Sonnenblick was the PI. The subsequent alliance with Dr. Leslie Leinwand gave birth to one of the first programs in molecular cardiology in the country. The combination of the Sonnenblick, Scheuer and Leinwand labs produced a collaborative research and training environment that may not have been equaled here up to the present time.

James Scheuer, M.D.
Professor Emeritus
University Chairman Emeritus
Department of Medicine

Wanted: Your Opinion!
Einstein magazine was redesigned recently with an eye to readability and attractiveness. To help us continue to improve Einstein, we’d like to solicit your opinion of the new magazine. We’ve posted a questionnaire online at www.einstein.yu.edu/survey2010 that should not take long to complete. We’d appreciate your assistance.

You can also e-mail us comments at letters@einstein.yu.edu. We look forward to hearing from you.

LARRY KATZENSTEIN
Science and Publications Editor

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A New Page in the Gottesman Library’s History

The recent face-lift of the D. Samuel Gottesman Library has attracted a crowd. “Our gate numbers were up even before the renovation was complete,” says Judie Malamud, director of the library. Good reviews from the initial improvements may have generated the increased traffic.

The Reading Room furniture is new and comfortable, with upholstered chairs in the wider spaces between some of the shelves and Aeron chairs in the group study rooms, she notes. Also, Einstein’s engineering department has outfitted 12 tables with new lamps and four electrical outlets each, for plugging in laptops. Freshly painted walls, revamped lighting and new carpeting have all made the library more open and inviting.

The final enhancement combined the circulation and reference desks into what Judie Malamud calls “a single user-friendly information point.” The renovation spared the Beren Room, which received its makeover several years ago thanks to support from the Beren family and Einstein’s Board of Overseers.

Look for the library to change even more radically in coming years. Beneath its main floor are two floors of stacks that—in this age of online access to journals—are largely superfluous. The campus master plan calls for gutting both stack floors and creating a wide-open space (see illustration at right).
Researchers at Einstein. Dr. Frenette will build on Einstein's stem cell expertise to create a premier research institute in this field. He'll be exploring new research directions, encouraging collaboration among researchers and recruiting new investigators. Dr. Frenette was recruited from Mount Sinai School of Medicine, where he was professor of medicine, hematology and medical oncology and of gene and cell medicine. In recent research on sickle-cell disease, he has uncovered key cellular and molecular events involved in the painful and dangerous blockage of blood vessels.

Mario J. Garcia, M.D., became chief of the Einstein/Montefiore division of cardiology on April 1. He also holds the Pauline A. Levitt Endowed Chair in Medicine at Einstein and is professor of radiology and codirector (with Robert Michler, M.D.) of the Montefiore-Einstein Heart Center. Born in Argentina, Dr. Garcia moved with his family to the Dominican Republic when he was four years old. He comes to Einstein via Dartmouth, the Cleveland Clinic and, most recently, New York's Mount Sinai, where he was professor of medicine and radiology in the School of Medicine and director of cardiovascular imaging at the medical center’s Cardiovascular Institute.

Stem cell and vascular biology researcher Paul S. Frenette, M.D., has been named the first director of the Ruth L. and David S. Gottesman Institute for Stem Cell and Regenerative Medicine Research at Einstein. Dr. Frenette will build on Einstein’s stem cell expertise to create a premier research institute in this field. He’ll be exploring new research directions, encouraging collaboration among researchers and recruiting new investigators. Dr. Frenette was recruited from Mount Sinai School of Medicine, where he was professor of medicine, hematology and medical oncology and of gene and cell medicine. In recent research on sickle-cell disease, he has uncovered key cellular and molecular events involved in the painful and dangerous blockage of blood vessels.

Rubina A. Heptulla, M.D., comes to Einstein from Baylor College of Medicine, where she was associate professor of pediatrics in the section of endocrinology & metabolism. She will direct the division of pediatric endocrinology and be a member of Einstein’s Diabetes Research Center. Dr. Heptulla is an expert on type 1 diabetes. Among her research projects, she is studying whether exenatide (a drug approved in 2005 for treating type 2 diabetes) can preserve the function of pancreatic beta cells in patients newly diagnosed with type 1 diabetes.

Thank You, Dr. Lazar!

Shortly after receiving his doctorate from Syracuse University in 1967, Stephen H. Lazar, Ed.D., arrived at Einstein—and he has been here ever since. As assistant dean for student affairs, he oversaw non-academic aspects of student life such as student finance, housing and recreational activities.

But his most visible activity was his celebrated role as grand marshal at Commencement. “The vision of Dr. Lazar in his robe and cap, holding his scepter, is likely in the mind’s eye of every alumni member from the classes of 1969 through 2010, as well as of Board members,” says Allen M. Spiegel, M.D., the Marilyn and Stanley M. Katz Dean.

After 43 years of dedicated service to Einstein, Dr. Lazar is leaving our community to become the executive dean of the Sackler School of Medicine for the New York State/American Program of Tel Aviv University. His office will be in Manhattan. “He will be missed,” says Dean Spiegel.

We encourage friends and alumni who would like to honor Dr. Lazar to contribute to the scholarship fund originally established in his honor by Einstein Overseer Arnold Penner and his wife, Madaleine Berley. Gifts may be sent to: Dr. Lazar Scholarship Fund, Albert Einstein College of Medicine, Office of Alumni Relations, Mazer 747, 1300 Morris Park Avenue, Bronx, NY 10461 or give online at www.einstein.yu.edu/lazar-scholarship-fund.
**Tweaking Einstein’s Research Future**

Even the best-laid plans need some updating.

Einstein’s first Strategic Research Plan, released in April 2007, has led to numerous advances—in stem cell research, genetics, epigenomics and many other research areas. Last fall, Allen M. Spiegel, M.D., Einstein’s Marilyn and Stanley M. Katz Dean, initiated a process for updating the plan, culminating in an April 26, 2010, retreat held in the Ethel and Samuel J. LeFrak Auditorium that was attended by more than 100 Einstein scientists.

Seven faculty committees had earlier been assigned a research theme and asked to formulate their visions for Einstein’s future and how the College of Medicine should get there. At the retreat, the leaders of the seven groups presented their recommendations. The groups and their leaders were:

**Basic biology:** Vern L. Schramm, Ph.D., the Ruth Merns Chair in Biochemistry (Steven C. Almo, Ph.D., presented);

**Stem cells and regenerative medicine:** Eric Bouhassira, Ph.D., the Ingeborg and Ira Leon Rennert Professor of Stem Cell Biology and Regenerative Medicine;

**Genetics and epigenetics:** Jan Vijg, Ph.D., the Lola and Saul Kramer Chair in Molecular Genetics;

**Behavioral/social and comparative effectiveness:** Betsy Herold, M.D., professor in the departments of pediatrics, of microbiology & immunology and of obstetrics & gynecology and women’s health;

**Imaging:** John S. Condeelis, Ph.D., the Judith and Burton P. Resnick Chair in Translational Research;

**Computational biology/bioinformatics:** Thomas E. Rohan, M.D., Ph.D., professor and chair in the department of epidemiology & population health;

**Einstein-Montefiore interface:** Victor S. Schuster, M.D., the Ted and Florence Baumrtritter Chair in Medicine.

“The revised strategic research plan will have major implications for Einstein,” Dean Spiegel noted. “For example, it will influence which new researchers we recruit and affect our hospital affiliations and campus master plan as well as our fundraising efforts, because gifts can create research programs.”

Members of Einstein’s Board of Overseers added their comments to the revised research plan at their May board meeting.

**Five Einstein Professors Receive Tenure**

On June 15, Dean Allen M. Spiegel announced that five faculty members have been approved for tenure, recognizing their exemplary careers as researchers and educators.

**Julia H. Arnsten, M.D., M.P.H.**
Chief, Division of General Internal Medicine  
Professor of Medicine  
Professor of Epidemiology & Population Health  
Professor of Psychiatry and Behavioral Sciences

**Ales Cvekl, Ph.D.**
Professor of Ophthalmology and Visual Sciences  
Professor of Genetics

**Paul S. Frenette, M.D.**
Director, Ruth L. and David S. Gottlesman Institute for Stem Cell and Regenerative Medicine Research  
Professor of Medicine  
Professor of Cell Biology

**Meredith Hawkins, M.D.**
Professor of Medicine (Endocrinology)  
Director, Global Diabetes Initiative

**Charles Query, M.D., Ph.D.**  
Professor of Cell Biology
On April 27, the Boards of Einstein and of Montefiore Medical Center got together for a reception at the Harmonie Club in New York City. The occasion celebrated the 10-year partnership agreement that Dean Spiegel and Steven Safyer, M.D. ’82, the president and chief executive officer of Montefiore, shook hands on in 2009. Dean Spiegel, Dr. Safyer, David Tanner, chair of the Montefiore Board of Trustees, and Ruth L. Gottesman, Ed.D., chair of the Einstein Board of Overseers, offered words of welcome and thanks. The spirit of collaboration between the two institutions is strong. Dean Spiegel, Dr. Safyer, David Tanner and Dr. Gottesman regularly attend each other’s Board meetings; Einstein Overseer Jay Goldberg regularly attends the Montefiore Board; and Montefiore Trustee Peter Neufeld represents the medical center at Einstein Board meetings. The Einstein community is grateful to all Board members for their leadership.

Davidoff Education Day

Soon after the start of his presentation, keynote speaker Paul Haidet, M.D., M.P.H., director of medical education research at Penn State University College of Medicine, had the crowd in the LeFrak Auditorium on its feet—participating in an early-morning, hands-on demonstration of his talk, “Getting Started with Team-Based Learning: A Strategy for Transforming the Quality of Teaching and Learning.” The occasion was the seventh annual Davidoff Education Day, an event intended to improve faculty teaching and increase the effectiveness of the curriculum. Dr. Haidet’s presentation was followed by lunch, workshops and a closing speech, “Active Learning in the Lecture Hall,” given by Michael S. Risley, Ph.D., associate professor of anatomy and structural biology at Einstein.

Leo M. Davidoff, M.D., was a distinguished neurosurgeon, a founding faculty member of Einstein and the first chair of general surgery. Faculty members who are excellent teachers and take an interest in their students are selected for the Davidoff Society, which was established in 1976 with 12 charter members; today, the membership numbers more than 240. Davidoff Education Day is sponsored by the Education & Faculty Support Committee and the office of faculty development.

Keynote speaker Paul Haidet, M.D., M.P.H., of Penn State University College of Medicine, onstage, got his audience actively involved in a team-based learning exercise.
These Hallowed Walls: Art at Einstein

Next time the elevator opens on the second floor of the Arthur B. and Diane Belfer Educational Center for Health Sciences, check out the wall in front of you. It contains a splendid collection of Louise Nevelson prints. Fine art is on display all over the Einstein campus. But too often, we pass it by without fully appreciating it. Some prime examples are featured below.

Artist: Natalie Handelman (1930–)
Medium: Acrylic
Location: Siegfried and Irma Ullmann Research Center for Health Sciences, seventh floor
Title: Betty’s Garden

Natalie Handelman painted Betty’s Garden to honor the memory of her beloved sister-in-law, Betty Meltzer. Betty created a voluntary organization to plant 1,000 trees along the median barrier of El Camino Real, the main road in Palo Alto, CA. After Betty died in 2008, the California legislature passed a resolution that renamed a portion of the highway “The Betty Meltzer Memorial Highway.” Betty’s Garden is dedicated to Betty Meltzer’s dream and remarkable legacy. Natalie Handelman is a resident of Purchase, NY. The generosity of Philip and Rita Rosen and Marilyn and Stanley M. Katz inspired her to donate the painting to Einstein earlier this year.

ON THE WEB
www.nataliehandelman.com

Artist: Helmuth Nathan (1901–1979)
Medium: Stained glass
Location: Max L. and Sadie Friedman Student Faculty Lounge, upstairs
Title: The Ages of Man

Helmuth Nathan, M.D., was born in Hamburg, Germany, in 1901 and educated at the Universities of Freiburg and Hamburg. On arriving at Einstein as a professor of surgery and founding faculty member in 1955, he was already a widely published researcher—and also a painter, sculptor and graphic artist whose work was displayed in art exhibits, museums, institutions and private collections. In 1973, Dr. Nathan was appointed professor and chair of the newly created department of the history of medicine. “Helmuth Nathan is perhaps best known among early Einstein students for bringing nude art models into the lecture hall and attempting to teach us medical students how to sketch the human figure,” says Irwin Dannis, M.D. ’60, who has cochaired the Einstein admissions committee for 25 years and occasionally leads art tours of the campus. Dr. Nathan’s stained-glass window on the Max and Sadie balcony is one of Dr. Dannis’ favorite Einstein art objects. “It is so touching, yet no one knows it’s there,” he says. Dr. Nathan also created the bust of Albert Einstein in the lobby of the Siegfried and Irma Ullmann Research Center for Health Sciences.
Louise Nevelson was one of America’s most innovative sculptors. Her best-known works were assembled from cast-off pieces of wood sprayed with dark paint. Many of her other works, including the prints at Einstein, are equally somber. Born Leah Berliawsky, Nevelson came with her family to America in 1905 from Kiev in the Ukraine, settling in Rockland, ME. Aware of her status as a foreigner, Nevelson used that feeling of “otherness” to advance her work. In 1920, she married Charles Nevelson, a cargo ship owner; they moved to New York and Nevelson pursued her art.

Israeli artist Reuven Rubin was born in Rumania and received his art education there and in Paris. He was the first artist to have a solo exhibition at the Tower of David in Jerusalem, in 1924, and his 1932 one-man show launched the Tel Aviv Art Museum. From the 1930s onward, Rubin designed backdrops for Habima Theater, Israel’s national theater, and was one of the first Israeli artists to achieve international recognition. Rubin had a distinctive artistic style—call it Henri Rousseau with Eastern nuances—and signed his first name in Hebrew and his surname in Roman letters. He served as Israel’s first ambassador to Rumania, from 1948 to 1950. Rubin’s autobiography, My Life—My Art, was published in 1969, and he received the Israel Prize in 1973 for his artistic achievement. This painting was donated by Max and Sadie Friedman.

Although former Einstein instructor Frank Netter grew up loving art, his family disapproved and diverted him into medicine. During the Depression, however, he used his talent to make some extra cash—and soon his drawings were in great demand. Eventually, Frank Netter, M.D., was hailed by the New York Times as “the Medical Michelangelo.” His beautiful illustrations—some 4,000 in all—enlightened generations of medical students. During the late 1950s and early 1960s, Einstein was fortunate to have Dr. Netter on campus as an anatomy instructor. He created many drawings on the green “blackboards” in the sixth-floor lecture hall in the Leo Forchheimer Medical Science Building. Dr. Netter’s talent also extended to portraiture, as shown by this painting of Max Friedman.
Match Day = Anxiety + Exhilaration

Match Day is a wedding day of sorts, when fourth-year medical students are paired with the hospitals and communities where they’ll be residents for the next few years. At noon on March 18 in the Evelyn & Joseph I. Lubin Student Activities Center, Nadine Katz, M.D., associate dean for students, and Stephen Baum, M.D., senior associate dean for students, sounded the gong allowing the 180 Einstein students gathered there to pick up envelopes bearing the names of their matches. The smiles, happy faces, hugs and high-fives showed that most were pleased to meet their futures.

“Our match results this year are among the best ever and include placements at some of the most prestigious hospitals around the country,” says Dean Spiegel. Einstein’s newest M.D.s will be stepping into residencies across the nation: Chicago (Northwestern Memorial Hospital), Houston (University of Texas Health Science Center), Boston (Massachusetts General Hospital), Los Angeles (the University of California Los Angeles Medical Center), Baltimore (Johns Hopkins Hospital) and New Haven (Yale–New Haven Hospital), to name just a few. Closer to home, nearly two dozen Einstein graduates matched at Montefiore Medical Center.

Two married couples were relieved: Patrick Colley was placed at New York Eye and Ear in the ear, nose and throat program, and Alaleh Akhavan was assigned to pediatrics at New York University, to be followed by dermatology at Einstein/Montefiore.

A little less ideally, Bert Prosser will be in emergency medicine at the University of Arizona in Tucson, while Nicole Johnson will be more than 100 miles away, in family medicine at Scottsdale Health Care Osborn Medical Center. They’ll meet in the middle, as married couples often do.

In keeping with Einstein’s emphasis on primary care, internal medicine was the leading residency choice, followed by pediatrics, emergency medicine and diagnostic radiology.

Match Day is sponsored by the National Residency Matching Program, which weighs applicants’ achievements and geographic preferences against the needs of participating hospitals.

CERC Video Wins Award

The Association for Women in Communications has awarded Einstein Overseer and Benefactor Rita Rosen a prestigious Clarion Award for Hope for the Future, a video she produced about Einstein’s Children’s Evaluation and Rehabilitation Center (CERC). The Clarion Awards honor excellence in clear, concise communications. The 2010 competition attracted entries from all over the world.

CERC provides a broad spectrum of clinical services for infants, children, adolescents and adults with serious developmental disabilities. Mrs. Rosen and her husband, Einstein Overseer Philip Rosen, donated the video to Einstein in 2009.

“In a brief 10-minute video, Rita managed to capture the spirit and soul of CERC, the dedication of our staff for our patients and the sense of gratitude that our patients and their families feel for the care they receive,” says Robert W. Marion, M.D., director of CERC and the Ruth L. Gottesman Chair in Developmental Pediatrics. “We congratulate her and hope that she continues her important work in the future.”

The video was screened for the first time at the Einstein National Women’s Division’s 2009 Spirit of Achievement Luncheon and helped attract support for the division’s successful $3 million fundraising initiative for a new clinical research program at CERC.

Mrs. Rosen is a past president of the National Women’s Division; she has produced 18 videos for Einstein. Mr. Rosen, who holds the title of Life Overseer, has served on the Einstein Board for 33 years.
In Memoriam

Several notable researchers and teachers passed away recently. All are fondly remembered.

Joseph Maio, Ph.D., professor emeritus of cell biology, died on February 13, 2010. A member of the Einstein faculty for more than 30 years, Dr. Maio was known among colleagues and students as a wonderful mentor and a “scientist’s scientist,” who was unassuming and selfless in the contributions he made in the laboratory. These contributions included the discovery of what he called component alpha DNA, later called alpha satellite or alphoid DNA. This DNA is a key component of human centromeres and forms the basis for minichromosomes that can be established in human cells. He also discovered nucleosome phasing and will be remembered as a pioneer in long interspersed repetitive sequences.

Helen M. Ranney, M.D., died on April 5, 2010, one week shy of her 90th birthday. During her distinguished career, she made groundbreaking contributions to the study of sickle-cell disease and achieved many historic “firsts” as a pioneering woman in medicine. An inspirational physician-scientist, Dr. Ranney was a member of the Einstein faculty early in her career, before being recruited to the University of California, San Diego, in 1973 as the first woman to chair a department of medicine.

Emile M. Scarpelli, M.D., Ph.D., died on April 13, 2010, at the age of 79. The Bronx native spent the early part of his career in the U.S. Air Force. He wrote the Air Force’s first textbook on aviation physiology before joining Einstein’s faculty as professor of pediatrics and of physiology & biophysics. A prolific author, Dr. Scarpelli was a pioneer in the study of pulmonary surfactant, the lipid-rich material produced by the lung’s alveolar cells that prevents the lungs from collapsing on exhalation. In premature babies, insufficient surfactant can cause potentially fatal infant respiratory distress syndrome. Dr. Scarpelli served for nearly 30 years as chief of pediatric pulmonology at Einstein, dedicating his life to the well-being of children.

Louis R. Orkin, M.D., a member of Einstein’s founding faculty, died on April 16, 2010, at the age of 94. From 1942 to 1945, he served as a captain in the U.S. Army Medical Corps and was awarded the Bronze Star. He was professor and chair of anesthesiology at Einstein from 1955 to 1982 and was named distinguished university professor emeritus of anesthesiology in 1986. Known to his colleagues, students and friends as a kind and gentle man, he was dedicated to the practice of medicine and medical education.

Morton I. Cohen, Ph.D., died on June 1, 2010. Dr. Cohen joined the faculty soon after Einstein opened in 1957, and remained active as professor emeritus of physiology & biophysics and of the Dominick P. Purpura Department of Neuroscience right up to the day of his passing. A member of several scientific societies and a recipient of numerous honors, prizes and other notable distinctions, Dr. Cohen showed a unique dedication to research, publishing a paper or two a year and presenting his work at the National Neuroscience Conference every year until the present.

Everett P. Dulit, M.D., Ph.D., died on June 2, 2010, shortly after celebrating his 81st birthday. Dr. Dulit joined the Einstein faculty in 1962, serving as a research fellow. He went on to become a noted psychiatrist with a special interest in adolescents; later in his career, he directed Einstein’s division of child and adolescent psychiatry. Dr. Dulit was also director of adolescent psychiatry at New York Hospital, Cornell University Medical Center–Westchester Division. He was a remarkable educator and mentor to generations of psychiatrists, psychologists and social workers. At the time of his death, he was associate clinical professor emeritus of psychiatry and behavioral sciences and associate clinical professor of pediatrics at Einstein.
Using sophisticated genetic analysis, scientists at Einstein and New York University School of Medicine have published a study indicating that Jews are a widely dispersed people with a common ancestry. Jews from different regions of the world were found to share many genetic traits that are distinct from those of other groups and that date back to ancient times. The study also provides the first detailed genetic maps of the major Jewish subpopulations, a resource that can be used to study the genetic origins of disease. The findings appear in the June 3 online issue of the *American Journal of Human Genetics*.

Some 237 participants were recruited from Jewish communities in the metropolitan New York region, Seattle, Athens, Rome and Israel. Subjects were included only if all four grandparents came from the same Jewish community. The results were compared with a genetic analysis of 418 people from non-Jewish groups around the world.

“This study provides new genomic information that can benefit not only those of Jewish ancestry, but the population at large,” says coauthor Edward Burns, M.D., executive dean and professor of pathology and of medicine at Einstein. “By providing a comprehensive genetic fingerprint of various Jewish subpopulations, a resource that can be used to study the genetic origins of disease. The findings appear in the June 3 online issue of the *American Journal of Human Genetics*.

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Migraine May Double Risk of Heart Attack

Migraine sufferers are twice as likely to have heart attacks as people without migraine, according to a study by Einstein researchers. The study, published in Neurology, found that migraine sufferers also face an increased risk for stroke and are more likely to have diabetes, high blood pressure and high cholesterol—key risk factors for cardiovascular disease.

More than 29 million Americans suffer from migraine, according to the National Headache Foundation. In the study, the researchers analyzed data on 6,102 people with migraine and 5,243 people without migraine.

“Migraine has been viewed as a painful condition that affects quality of life, but not as a threat to people’s overall health,” says lead investigator Richard B. Lipton, M.D., senior author of the study and professor and vice chair in the Saul R. Korey Department of Neurology at Einstein. He also directs the Headache Center at Montefiore Medical Center.

Faulty Cleanup Process May Be Key Event in Huntington’s Disease

Einstein scientists have shown for the first time that the accumulation of a mutated protein may explain the cell damage that occurs in Huntington’s disease. Their research—a step toward a possible treatment for the disease—was published in April in Nature Neuroscience.

Huntington’s disease, which afflicted the folk singer Woody Guthrie, is a fatal, inherited neurodegenerative disorder. It results from a gene mutation that leads to a defective form of the huntingtin protein. The mutation is dominant, meaning that a child of an affected parent has a 50 percent chance of inheriting Huntington’s.

“Studies have shown that Huntington’s disease occurs in part because the mutated huntingtin protein accumulates within cells and is toxic to them,” says Ana Maria Cuervo, M.D., Ph.D., professor of developmental and molecular biology, of anatomy and structural biology and of medicine at Einstein and senior author of the study.

All cells rely on several different mechanisms to break down “old” proteins and other components and recycle them. Collectively known as autophagy (literally, “self-eating”), these processes keep cells clean.

One mechanism for cleaning up cells involves forming a membrane around the protein or other cellular structure requiring removal. These “garbage bags” (known as autophagosomes) then travel to enzyme-filled sacs known as lysosomes that fuse with the bags and digest their cargo. But the cleanup efforts go awry in Huntington’s disease.

Dr. Cuervo and her team found that the defective huntingtin proteins stick to the inner layer of autophagosomes and prevents protein collection; proteins accumulate and poison cells.

The main message of the study, says Dr. Lipton, is that migraine patients and their doctors should pay particular attention to identifying and managing cardiovascular risk factors, such as high blood pressure, high cholesterol, obesity and diabetes.

Other Einstein researchers who were involved in the study are Dawn Buse, Ph.D., Marcelo E. Bigal, M.D., Ph.D., and Matthew S. Robbins, M.D.

Dr. Lipton is also the Lotti and Bernard Benson Faculty Scholar in Alzheimer’s Disease and professor of psychiatry and behavioral sciences and of epidemiology & population health at Einstein.
New Major Grants at Einstein
Research at the College of Medicine is being fueled by an impressive number of recent grants.

Tuberculosis (TB) is the world’s most deadly bacterial infection, killing two million people each year. Multidrug-resistant (MDR) and extensively drug-resistant (XDR) strains of *Mycobacterium tuberculosis*—the bacterium that causes TB—are becoming increasingly common. In addition, the deadly combination of TB and AIDS is magnifying the effects of both epidemics, particularly in Africa. Several large grants have put Einstein at the forefront of the effort to control TB and develop better therapies.

- Sarita Shah, M.D., assistant professor of medicine and of epidemiology & population health at Einstein, has studied global TB for six years and coined the term XDR-TB in a 2006 paper. Dr. Shah has been awarded a five-year, $3.9 million grant from the NIH to study how XDR-TB is transmitted in rural South Africa. Her findings could alter public health approaches in the developing world.
- Neel Gandhi, M.D., assistant professor of medicine and of epidemiology & population health, has received a five-year, $4 million grant for the first-ever prospective study of antiretroviral therapy for people in South Africa who are coinfected with MDR-TB and HIV. Dr. Gandhi was lead author of the 2006 *Lancet* study describing the deadly outbreak of XDR-TB in Tugela Ferry, a rural part of South Africa’s KwaZulu-Natal province. The startling findings—52 of 53 XDR-TB patients died within weeks of arriving at a hospital—brought the crisis of HIV/TB coinfection to the world’s attention.
- William R. Jacobs Jr., Ph.D., professor of medicine, of microbiology & immunology and of genetics, a Howard Hughes Medical Institute investigator and a primary researcher at KwaZulu-Natal Research Institute for Tuberculosis and HIV, will systematically knock out every *Mycobacterium tuberculosis* gene to find those genes on which the bacterium depends for resisting drugs and causing disease. His three-year, multimillion-dollar NIH grant will support the work.
- James Brust, M.D., assistant professor of medicine, received a five-year, $665,000 National Institute of Allergy and Infectious Diseases (NIAID) Career Development Award to evaluate a novel, home-based treatment program he developed for patients coinfected with HIV and MDR-TB in rural South Africa.

Einstein has received a five-year, $10.8 million grant to develop stem cell–based therapies that could help treat military personnel, first responders and the general public exposed to radiation from a nuclear accident or terrorist attack. The therapy will be aimed at radiation-induced gastrointestinal syndrome, which can occur as part of the potentially fatal acute radiation syndrome (ARS). “Currently, post-event strategies for responding to ARS must be carried out within the first several hours of an event, and those strategies have shown only marginal protection,” said lead investigator Chandan Guha, M.B.B.S., Ph.D., professor and vice chair of radiation oncology.

Dr. Guha has found that animals receiving lethal doses of abdominal radiation can be rescued by intravenous transplants of bone marrow–derived stromal cells administered 24 hours after radiation exposure. With the new grant, he will adapt his transplant technique to human use. The research, funded by the federal Centers for Medical Countermeasures against Radiation, is part of a program coordinated by the NIAID.
The genomics of immunity

Aberrant immune responses cause a wide range of autoimmune diseases, including type 1 diabetes and multiple sclerosis. In a project he calls “Atoms to Animals: Structural Genomics of Immunity,” Stanley G. Nathenson, M.D., distinguished professor of microbiology & immunology and of cell biology and the Samuel H. Golding Chair in Microbiology, is studying the molecules that control adaptive and innate immunity, the two main types of immune response. Dr. Nathenson has received an NIH grant of nearly $6 million to support his work.

Targeting a parasite

Kami Kim, M.D., professor in the departments of medicine (infectious disease) and of microbiology & immunology, has received an NIH grant of more than $3 million over five years to support her research on Toxoplasma gondii, a parasitic pathogen that causes severe disease in immunocompromised individuals, including people with AIDS. Dr. Kim and her team will use epigenomics, proteomics and computational biology in studying newly discovered T. gondii genes that appear to regulate genes that govern the parasite’s development. The research may lead to better drugs that work by targeting the T. gondii genes.

Identifying enzymes

A research team that includes Einstein scientists has received a prestigious NIH “glue grant” to identify the structure and function of enzymes discovered in genome-sequencing projects. So-called glue grants are aimed at complex problems of central importance to biomedical science but beyond the means of any one research group.

Over the next five years, the team will receive $33.9 million, of which Einstein will receive approximately $11 million. The research project may result in new drug targets for treatments. It may also lead to new enzymes that could prove useful for catalyzing industrial reactions.

In recent years, scientists have sequenced the genomes of thousands of organisms, from bacteria to humans, encompassing more than 10 million genes. But it’s not clear what many of these genes do or which proteins they make.

“The specific functions of perhaps half of these genes and the proteins they make are unknown or have been mistakenly characterized,” says coinvestigator Steven C. Almo, Ph.D., professor of biochemistry and of physiology & biophysics at Einstein. “The consortium will be working to close this gap.”

(continued on next page)
New Major Grants at Einstein (continued)

This glue grant focuses on enzymes—proteins that catalyze the chemical reactions required for life and enable organisms to live in complex environments and to adapt to a variety of conditions. “The knowledge gained will give us a better sense of the breadth of enzymatic and metabolic activities that exist in nature,” says Dr. Almo. “It will also further our understanding of disease and help us identify new targets for drug development.”

Once other team members have identified enzymes of interest, Dr. Almo and his Einstein colleagues will be responsible for purifying those enzymes and then using X-ray crystallography to determine their molecular structure. (X-ray crystallography is a method that reveals the arrangement of atoms within a protein by striking a protein crystal with a beam of X-rays.)

Dr. Almo’s team includes Ronald D. Seidel, Ph.D., associate in biochemistry and associate director of the Albert Einstein Macromolecular Therapeutics Development Facility.

In addition to Einstein, members of the consortium include the University of Illinois, the University of Virginia, Texas A&M University, the University of Utah, Vanderbilt University School of Medicine, Boston University and the University of New Mexico.

**$10 million NIH grant for stem cell labs**

The NIH funds the stem cell research of nearly two dozen Einstein researchers. In April, the NIH awarded Einstein $10 million to create stem cell laboratories for several new senior investigators—a grant that will significantly expand Einstein’s capabilities in stem cell research.

“A key aspect of our plan is to embed stem cell laboratories within easy reach of Einstein’s centers in diabetes, cancer, HIV/AIDS, liver disease and women’s health to encourage the free flow of science,” says Harry Shamoon, M.D., associate dean for clinical and translational research. The laboratory renovations, slated for the next two years, will improve Einstein’s capabilities in four broad areas: 1) stem cell biology, 2) stem cell genetics, 3) cancer stem cells and 4) translational stem cell research.

**Diabetes center wins NIH support**

Einstein’s Diabetes Research and Training Center (DRTC) has received a five-year, $9.5 million grant from the National Institute of Diabetes and Digestive and Kidney Diseases of the NIH. The DRTC was also awarded $632,000 in federal stimulus money, totaling more than $10 million in federal support. Einstein’s DRTC is the only comprehensive center in New York and one of only seven DRTCs nationwide.

“These grants come at a critical time,” says Jeffrey Pessin, Ph.D., principal investigator and director of Einstein’s DRTC, who holds the Judy R. and Alfred A. Rosenberg Professorial Chair in Diabetes Research and is also professor of medicine and of molecular pharmacology at Einstein. “Diabetes is already a major threat to public health and its prevalence is quickly rising—not only here in the Bronx, but also nationally and internationally.”

**Einstein designated a center of excellence in aging**

In recognition of its leadership in aging research, Einstein has been named by the NIH as one of five Nathan Shock Centers of Excellence in the Basic Biology of Aging. The College of Medicine’s selection comes with a $3.1 million, five-year grant that funds three core areas of research unique to Einstein.
Leaders of the new center will include three members of Einstein’s Institute for Aging Research, founded in 2002:

- Nir Barzilai, M.D., professor of medicine and of genetics and the Ingeborg and Ira Leon Rennert Professor of Aging Research, who will direct Einstein’s Nathan Shock center. “The role of age in disease is underestimated,” explains Dr. Barzilai. “Aging is a major factor for the development of most adult-onset diseases. If we are able to determine the biology of aging, then we can look for ways to protect against it and increase health span, or live disease-free even into advanced old age.” Dr. Barzilai will run the center’s Healthy Aging Physiology Core.

- Ana Maria Cuervo, M.D., Ph.D., professor of developmental and molecular biology, of anatomy and structural biology and of medicine, who will direct the Cellular and Tissue Aging Core. Dr. Cuervo is an expert on cellular and organ aging.

- Jan Vijg, Ph.D., professor and chair of genetics and the Lola and Saul Kramer Chair in Molecular Genetics, who will lead the Genomics and Epigenomics of Aging Core. Dr. Vijg has gained international recognition for his use of genetically engineered mice to investigate how DNA damage influences human disease and aging.

Other faculty members in the center include Yousin Suh, Ph.D., associate professor of medicine and of genetics, and Radhika Muzumdar, M.D., M.B.B.S.

The Nathan Shock Centers are named in honor of Nathan Wetherell Shock, Ph.D., who began his gerontology career in 1941. Dr. Shock took a two-man aging unit and built it into the NIH’s internationally respected Gerontology Research Center. He helped to catalyze aging research in the United States for nearly half a century.

“Einstein’s three research cores will carry on Shock’s mission and add to our understanding of the cellular, genetic and physiological factors that influence health and longevity,” says Felipe Sierra, Ph.D., director of the National Institute of Aging’s Division of Aging Biology.

The other Nathan Shock aging centers are in Maine (the Jackson Laboratories), Michigan (University of Michigan), Texas (University of Texas Health Sciences Center in San Antonio), and Washington (University of Washington).
Suppose researchers proposed a drastic change in the American diet, with no clinical trials to support its safety or efficacy. They’d probably be labeled irresponsible. Why, then, are so few scientists upset about the recent call by the Institute of Medicine (IOM) for mandatory restrictions on the amount of salt allowed in foods?

That’s what Michael Alderman, M.D., professor of epidemiology & population health and of medicine at Einstein, is asking. “In effect, the IOM is saying, ‘We believe that lowering salt intake will do some good in terms of cardiovascular health—and to test that, we are going to change the food given to 300 million people,’” says Dr. Alderman. “It’s an experiment—with a poor research design. It wouldn’t pass any IRB [institutional review board].”

It would be convenient to dismiss Dr. Alderman as a gadfly who delights in tweaking the scientific establishment. But Dr. Alderman is a part of that establishment: a hypertension expert (editor-in-chief of the American Journal of Hypertension) with hundreds of peer-reviewed articles to his name.

Moreover, his views are supported by the Cochrane Collaboration and the U.S. Task Force on Preventive Services, two well-respected groups that assess the evidence for health interventions. Both have concluded that there is not enough evidence to support a general recommendation to reduce sodium intake.

Less Salt, Fewer Deaths?
The IOM’s salt recommendations were published in an April 2010 report, “Strategies to Reduce Sodium Intake in the United States.” The rationale: Americans consume too much salt; elevated salt intake contributes to hypertension (high blood pressure); hypertension causes stroke as well as heart disease, the nation’s leading killer; clinical trials show that reducing salt intake lowers blood pressure; ergo, public health agencies should intervene to lower everyone’s salt consumption to prevent deaths from heart disease.

According to the IOM, our salt (sodium) consumption has risen significantly since the early 1970s, with the average American now consuming more than 3,400 mg (about 1 teaspoon) of sodium per day—about 50 percent more than current dietary guidelines call for. This consumption level, claims the IOM, threatens the health of everyone—not just those with hypertension or at risk for developing it.

Since most salt we consume is found in processed or prepared foods, the IOM recommends that the FDA set “mandatory national standards for the sodium content in foods” and “begin the process of reducing excess sodium in processed foods and menu items to a safer level.”

The health benefits would be huge, claims the IOM report, citing studies suggesting that salt restriction could prevent more than 100,000 deaths and save billions in healthcare costs each year.

Many in the medical community cheered the IOM report. “After tobacco control, the most cost-effective intervention to control chronic diseases might be reduction of sodium intake,” comments Thomas Frieden, M.D., director of the Centers for Disease Control and Prevention, in the Annals of Internal Medicine. But there was some dissent.

A Bad Rap for Salt?
The Salt Institute, a nonprofit trade industry association, called the IOM’s report “reckless and flawed.” While the Salt Institute’s stance should be taken with, well, a grain of salt, it may have science on its side, says Dr. Alderman. (Full disclosure: Dr. Alderman has been a member of the Salt Institute’s
Diet and Cardiovascular Risk Advisory Committee since 1996 and received an honorarium for participating in a 1996 consultants’ meeting.)

“I certainly hope salt reduction would help,” he says. “If you could save all those lives by taking a half a teaspoon of sodium out of the daily American diet, what’s not to like?” Most likely to gain, he says, would be the minority of people whose hypertension results from a high-salt diet. But he is convinced that lowering salt will have no benefit for most people and could prove harmful to some.

Dr. Alderman takes issue, first, with a key IOM justification for cutting salt: a significant increase in per capita salt consumption since the 1970s. He offers three reasons for skepticism:

- A close look at the per capita salt-consumption chart in the IOM’s own report reveals that salt intake did rise in the 1970s and 1980s but has leveled off since 1988.
- Rather than having an ever-increasing taste for salt, human physiology suggests that our appetite for salt may be set at a fixed level. Writing last November in the *Clinical Journal of the American Society of Nephrology*, nephrologist David McCarron, M.D., of the University of California, Davis, cautions that a set point would mean that “attempt[ing] to use public policy to abrogate human physiology would be futile and possibly harmful to human health.”
- If our salt intake is rising, our intake of iodine should show a similar rise. This trace element is essential for normal brain development in fetuses, prevents thyroid conditions such as goiter—and is obtained solely through the diet, mostly from iodized salt. But in a June 10 letter in the *New England Journal of Medicine*, members of the American Thyroid Association caution against reducing salt intake, noting that “iodine levels in the United States have decreased by 50 percent in the past three decades.”

The IOM’s main contention is that reducing dietary salt will lower the risk of heart disease. Its report cites several studies in which improved heart health was observed in large groups of people whose salt intake was reduced.

But observational studies “have inherent limitations,” says Dr. Alderman. “Those salt studies show only what happens to people on a particular diet that they’ve chosen—and nothing about the effect of arbitrarily reducing salt intake.” Moreover, he says, observational studies on salt have produced conflicting results. He cites an observational study of his own, published in 1995 in *Hypertension*, as evidence that reducing salt can be risky.

Cut the Salt, Harm the Public?

In the *Hypertension* study, Dr. Alderman and his colleagues measured the sodium intake of nearly 3,000 people with mild to moderate hypertension and then monitored their health for an average of 3.8 years. Over that span, men in the lowest quartile for sodium intake were more than twice as likely to suffer heart attacks as men in the highest quartile for sodium intake. (No such association was found for women.)

“Studies have shown that sodium intake and renin activity are inversely related—and we know that increased renin activity damages the heart and blood vessels,” he says. “In addition, reducing salt increases insulin resistance, which leads to diabetes, the leading risk factor for cardiovascular disease in this country. These and other adverse effects have been demonstrated in the same clinical trials cited in the IOM report in which reducing sodium intake was found to lower blood pressure.”

“The bottom line,” says Dr. Alderman, “is that the overall impact of reducing sodium in the diet is the net result of all its effects—beneficial (lowered blood pressure) as well as harmful (increased insulin resistance and increased renin activity). For that reason, he says, “the positive effect of reduced blood pressure for some people must be weighed against the adverse effects that will also result.”

Needed: Clinical Studies

The best way to settle the salt controversy, says Dr. Alderman, “is to carry out the population-based, randomized trials that can show how reducing salt in the diet affects important health outcomes, such as stroke, heart attack and death.”

Dr. Alderman acknowledges that such trials would be costly. “But it seems to me,” he says, “that it would be safer to do a careful study of, say, 5,000 people than an uncontrolled study of 300 million.

“I’d even volunteer,” he adds with a sly smile, “as long as I’m not in the low-salt group.”

ON THE WEB

Visit [www.einstein.yu.edu/salt2010](http://www.einstein.yu.edu/salt2010) to hear Dr. Alderman discuss salt with Gordon Earle, Einstein’s associate dean for communications and public affairs.
A novel treatment for gout that was coinvented by Vern Schramm, Ph.D., Ruth Merns Chair in Biochemistry, has performed well in a recent clinical trial. Gout is a type of arthritis that occurs when excess amounts of uric acid in the blood trigger the formation of needlelike urate crystals. These crystals typically accumulate in one of the joints—most commonly in the big toe but sometimes the knee—where they can cause excruciating pain. Gout was once called “the disease of kings” because it seemed to follow overindulgence in food and drink.

The promising gout drug stemmed from Dr. Schramm’s work in devising transition-state analogs as inhibitors of purine nucleoside phosphorylase (PNP), an enzyme implicated in T-cell cancers, autoimmune diseases and gout. Transition states last just one billionth of a millionth of a second and form in every chemical reaction, including whenever PNP converts one chemical (the substrate) into another (the product).

After figuring out PNP’s transition state by a combination of isotope labels and computer modeling techniques, Dr. Schramm worked with his coinventors at Industrial Research Ltd. in New Zealand to synthesize a family of transition-state analogs targeting the enzyme. The analogs mimic PNP’s transition state and powerfully inhibit the enzyme by binding to it much more tightly than its normal substrate does.

Einstein’s office of biotechnology licensed the underlying technology to BioCryst Pharmaceuticals, Inc., in June 2000. Dr. Schramm’s first-generation PNP inhibitor, forodesine, binds to PNP more than 700,000 times tighter than its normal substrate. It also was licensed to BioCryst Pharmaceuticals and has shown promising results in a pivotal Phase 2B clinical trial for treating T-cell cancers.

The gout drug—a second-generation PNP inhibitor also licensed to BioCryst—binds to PNP even more powerfully than does forodesine. This drug, which BioCryst calls BCX-4208, recently achieved impressive results in a Phase 2 clinical trial.

In this randomized double-blind study, gout patients took either BCX-4208 or a placebo once a day for 21 days. At the end of that time, three different doses of the drug had each achieved a statistically significant reduction in uric acid blood levels compared with the placebo. BioCryst began additional Phase 2 studies of BCX-4208 alone and in combination with allopurinol, a standard drug for treating gout.

Interestingly, the action of PNP inhibitors in gout differs from their effect on the rapidly dividing T cells of T-cell cancers. “PNP is essential for converting nucleic acid fragments into uric acid—a reaction that occurs primarily in the liver,” says Dr. Schramm. “Our PNP inhibitor for gout is preventing uric acid formation in that organ.”
Four Grad Students Recognized for Outstanding Research

Four Ph.D. students were honored for research excellence at the 14th Annual Julius Marmur Symposium in March. The all-day event featured presentations by the awardees in the morning, poster presentations after lunch and a well-deserved celebration in the Lubin Dining Hall in the late afternoon. Their work was considered likely to have a high impact on their fields of study.

The symposium is held in memory of Julius Marmur, Ph.D., a professor in the departments of biochemistry and genetics at Einstein and an enthusiastic and dedicated educator. The “grad student researchers of the year” for 2010 are:

Melissa E. Smith, a graduate student in the laboratory of Ganjam V. Kalpana, Ph.D., in the departments of genetics and of microbiology & immunology, for her research on targeted therapies for rhabdoid tumors, aggressive and incurable malignancies in children. She has been invited to present her work during the 2010 National Graduate Student Symposium at St. Jude Children’s Research Hospital.

Hongbo Wang, Ph.D., a graduate student in the lab of Liang Zhu, M.D., Ph.D., in the department of developmental and molecular biology, for his work in cell-cycle and cancer research. He identified the molecular pathway that causes androgen-sensitive prostate cancer cells to proliferate. After receiving his Ph.D. at Einstein in June 2009, Dr. Wang joined the lab of Marc Montminy, M.D., Ph.D., at the Salk Institute as a postdoctoral fellow.

Kurt C. Marsden, a graduate student in the lab of Reed Carroll, Ph.D., in the Dominick P. Purpura Department of Neuroscience, for discoveries involving neurotransmitters and their role in memory formation. He has been invited to present his work at the Brain and Spinal Injury Center of the University of California, San Francisco, and Northwestern University’s department of neurobiology.

George Han, a graduate student in the lab of Joel M. Friedman, M.D., Ph.D., department of physiology & biophysics, for his work in developing nanoparticles that release nitric oxide gas and in studying their many potential uses, ranging from clearing up skin abscesses caused by antibiotic-resistant bacteria to treating erectile dysfunction. He has presented his work at numerous conferences and received a science and travel award to an international meeting in Stockholm, Sweden.

Einstein Student Wins ASCP Award

Sophie Rodriguez, Class of 2010, was the winner of the American Society for Clinical Pathology’s Award for Academic Excellence and Achievement. Dr. Rodriguez was nominated by Michael Prystowsky, M.D., Ph.D., professor and chair of pathology. She will be doing her residency at Montefiore Hospital in the pathology department and wants to continue working with the people of the Bronx.

Honoring Faculty Mentors

At a May ceremony in the Lubin Dining Hall, Anne Etgen, Ph.D., and Sylvia Wassertheil-Smoller, Ph.D., received the 2010 Faculty Mentoring Awards. The awards are presented annually to senior faculty members who have merited distinction in mentoring Einstein junior faculty in their career development. Dr. Etgen, who received the award for basic sciences, is professor of neuroscience, of psychiatry and behavioral sciences and of pediatrics. Dr. Wassertheil-Smoller, who received the award for clinical sciences, is the Dorothy and William Manealoff Foundation & Molly Rosen Chair in Social Medicine and professor of epidemiology & population health.

Before Dean Allen Spiegel presented the awards, Matthew Scharff, M.D., distinguished professor in the departments of cell biology and medicine and Harry Eagle Professor of Cancer Research/ National Women’s Division, and Ruth Stein, M.D., professor of pediatrics, delivered brief remarks on the value of mentoring. Both were recipients of the Faculty Mentoring Award at its inception in 2007.
Superheroes and Superegos: Analyzing the Minds Behind the Masks

by Sharon Packer, M.D.
Assistant Clinical Professor,
Department of Psychiatry and Behavioral Sciences

Superman, Batman, Wonder Woman: Why do we love our superheroes and worship the ground they walk on (or the air they fly through)? Extraordinary physical assets—faster than a speeding bullet, more powerful than a locomotive—are one reason. But as Dr. Packer, a practicing psychiatrist, posits in her book, our favorite superheroes are really more about superegos than about superhuman bodies and brawn.

In Freudian theory, the superego is the moral part of the personality from which our sense of right and wrong arises. It provides a force that guides our superheroes’ behavior.

Consider Superman, who first appeared in print in 1938. “It’s hardly a coincidence that the superhero with a superego emerged at the same time that a superpower without a superego emerged and extended his reach across Europe,” writes Dr. Packer. Some early superheroes actually took on Hitler in the pages of comic books.

Iron Man and Wolverine fit into Dr. Packer’s “wounded warrior” class of superheroes. They’ve sustained earlier physical or psychological injuries but are unbowed. Who wouldn’t be inspired by an attempt to right a wrong, by self-confidence in spite of an absent father, by the courage to confront fears head-on? Dr. Packer calls it “post-traumatic strength syndrome.” The rectitude of the superhero provides a perfect foil for the most villainous villains.

Some of our superheroes, says Dr. Packer, reflect the tenets of Jungian psychology. Superman—the appealing hero with a secret identity, Clark Kent, “the great schlemiel of superhero stories”—exemplifies the Jungian concept of the “shadow self.”

The author also explores the interplay between female superheroes and women’s roles and women’s rights, noting that Wonder Woman and Sheena were forerunners of the feminist movement. Psyches move society, society moves the psyche and the media mediates, says Dr. Packer.

The supernatural has long imbued the human psyche, Dr. Packer notes. And our modern superheroes are but the latest manifestations of gods and myths that for millennia have comforted people and influenced their lives.

Whatever our various superheroes are telling us—that we can be strong or self-reliant, or even reinvent ourselves— their messages may resonate with our inner yearning: that we can be more than we thought we could be.

PUBLISHED BY: Praeger, 2009
meticulously give credit where due.

The book’s take-home message: People fail at weight control because their eating plans don’t account for the biological and psychological variables that influence weight. The Karasus cite one study in which “weight cyclers” or “yo-yo dieters” were more likely to succeed if they were committed to making behavioral changes. Motivation can make all the difference between losing and gaining, say the authors, both of whose fathers were obese. The book is dedicated to them.

Perhaps belying its title, The Gravity of Weight: A Clinical Guide to Weight Loss and Maintenance doesn’t offer a comprehensive weight-control plan. The Drs. Karasu, both psychiatrists, devote most of their book’s 400 pages to examining the complex psychological and physiological aspects of the mind, brain and body that make weight loss such a challenge. The book is geared to physicians, psychologists and other clinicians who specialize in obesity.

The hefty volume covers what must be every factor ever implicated in overweight: psychological outlook, psychiatric disorders (such as depression), metabolic complexities, medical conditions, exercise, circadian rhythms and diet. Genetics plays a role too, with the authors noting that identical twins raised apart resemble each other in weight more than do siblings raised together. The book references some 900 publications, and the writers

Now, all the entries from Pulse’s first year have been collected and published in traditional book form. Subjects range widely, from a physician’s exasperation to a nurse’s inspiration, from physical exams to terminal illness.

The following poem is from patient Kathleen Grieger, who has written hundreds of poems about her brain surgeries and her interactions with physicians and other healthcare professionals.

Mistaken Identity
by Kathleen Grieger

Surgery finished, I finally sleep
Pushing my shoulders, the technician wakes me
“Come now, we need a chest x-ray”
Smiling, she pulls me into position
The x-ray machine tight against me
Finally getting a chance, I ask what she is doing
“Oh,” she says “I have the wrong one
You are not a 64 year old male”
Lying me down, she walks away
As I fall back to sleep, I wonder, now bald
what I must look like
LIGHTING UP THE CELL

by Gary Goldenberg

Above: Aequorea victoria, the Pacific jellyfish that gave green fluorescent protein to the scientific world.

At right: Image from a movie in which fluorescent proteins reveal breast tumor cells (green) migrating toward blood vessels (red) during metastasis. Image courtesy of Evanthia Roussos and John Condeelis, Ph.D., of Einstein’s Gruss-Lipper Biophotonics Center.
With help from a glowing jellyfish, Einstein researchers can now see biology in action

For proof that all species are worth saving, consider the humble jellyfish *Aequorea victoria*, which floats in waters off the U.S. Pacific coast. It was largely ignored until the latter half of the 20th century, when a scientist became curious about its beautiful bioluminescent properties and found it possessed an amazing molecule: green fluorescent protein (GFP), which exhibits bright green fluorescence when exposed to blue or violet light.

Scientists now had a tool for tagging molecules that would revolutionize optical (light) microscopy—an advance that has been compared to Van Leeuwenhoek’s discovery of the microscope itself. In recognition of GFP’s importance, the three scientists chiefly involved in its discovery and development were awarded Nobel Prizes in Chemistry in 2008.

Illuminating the invisible
Living organisms possess tens of thousands of different proteins. In every cell at any one time, dozens of teams of proteins are directing the processes vital to life—DNA replication, cell division, respiration and many others, depending on the type of cell. Diseases such as cancer occur when this protein machinery malfunctions—which is why uncovering the roles of different proteins in the body is so important. Until GFP came along, cells typically had to be killed and preserved so that proteins could be detected. GFP has allowed scientists to tag and view a single protein as it migrates through a living cell or interacts with other proteins.
Serious diseases affect the entire body. But they arise at the cellular level, due to proteins or other molecules that behave abnormally. FPs allow scientists to observe, in real time and in living cells, the molecular glitches that underlie diseases—knowledge vital for developing therapies against health problems that so far resist effective treatment.

In this table, we list several of the faulty molecular and cellular processes that FPs have illuminated and diseases associated with those aberrations.

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<thead>
<tr>
<th>Abnormality Detected</th>
<th>Disease</th>
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<td>Proteins travel to wrong cellular compartment</td>
<td>cystic fibrosis</td>
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<tr>
<td>Protein clumping creates “traffic jams” in nerve cells</td>
<td>Parkinson’s disease</td>
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<tr>
<td>Impaired intracellular “garbage removal”</td>
<td>Huntington’s disease</td>
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<tr>
<td>Movement of cancer cells into blood vessels</td>
<td>metastatic cancer</td>
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<tr>
<td>Altered intracellular structures</td>
<td>Parkinson’s, progeria</td>
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Researchers can also follow cells as they move through living tissues. So thanks to GFP and other fluorescent proteins (FPs), scientists can observe both normal and pathological biological processes that had previously been invisible to them.

Fluorescent microscopy is flourishing at Einstein, where scientists are devising new types of FPs and using them in novel ways. Einstein researchers are employing FPs to learn how cancer spreads, how cells carry out their internal housekeeping, how misfolded proteins trigger neurological diseases and more.

**From jellyfish to coral**

Until about a decade ago, there were fewer than a dozen FPs—most of them variations on green, yellow and blue. So as a practical matter, researchers studying living cells could follow just two or three different molecules at a time. In 1999 came the next great advance in fluorescent microscopy, when Russian scientists studying coral isolated the first red FP. The next year Vladislav Verkhusha, Ph.D., working in Kyoto, Japan, published a paper describing the biochemical and photochemical properties of this new FP. Dr. Verkhusha is now associate professor of anatomy and structural biology at Einstein, where he remains in the vanguard of FP research.

In a paper published earlier this year in Chemistry & Biology, Dr. Verkhusha reported discovering the crystal structure of two key fluorescent proteins—one red and one blue. That crucial knowledge has enabled him to design new and differently colored FPs in a rational way.

“Creating novel FPs had been a hit-or-miss affair,” says Dr. Verkhusha. “Scientists had to fuse the genes of already-discovered FPs to the genomes of bacteria and then expose millions of those bacteria to radiation, in the hope that random genetic mutations would lead to new FPs. Now that we know those two crystal structures, we have a road map for designing new and differently colored FPs.”

By greatly expanding the FP palette in recent years—creating FPs in different hues of red, blue and orange, FPs that switch from one color to another and even FPs that change color over time—Dr. Verkhusha has helped revolutionize optical microscopy.

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The numerous functions going on in living cells occur mainly through molecular interactions—especially proteins interacting with other proteins,” says Steven C. Almo, Ph.D., professor of...
biochemistry and of physiology & biophysics at Einstein and Dr. Verkhusha’s coauthor on the Chemistry & Biology paper. “To understand what is happening, you ideally want to follow a number of different protein-protein interactions simultaneously—which means the more colors you have for tagging those proteins, the better. That’s why the FPs that Vlad is developing are so exciting—they allow you to actually see the machinery of life as it comes together.”

An FP primer
Dr. Verkhusha’s colorful creations belong to several categories of FPs, including the following:

Far-red FPs: Until recently, FPs couldn’t be used to peer inside a live animal. The reason: hemoglobin in an animal’s blood effectively absorbs the blue, green, red and other wavelengths used to stimulate standard FPs and that are emitted by FPs when they fluoresce. Now, in an exciting development described earlier this year in Biophysical Journal, Dr. Verkhusha has created an FP that can be stimulated by wavelengths that pass right through hemoglobin—wavelengths at the far-red end (611 nm) of the visible spectrum. This far-red FP, called TagRFP657, fluoresces at the far-red end as well, and this emitted light (657 nm) can be seen with the use of special emission filters. (See images at right.)

Far-red FPs will allow scientists noninvasively to track molecules and cells that participate in biological processes occurring deep within tissues, organs or even entire animals. In addition, far-red FPs can reveal tumors—an important medical advance.

Recently, in collaboration with the laboratory of John Condeelis, Ph.D., Dr. Verkhusha developed three populations of mouse breast cancer cells, each of which expressed a different FP: CyanFP (blue), GFP (green) and TagRFP657 (far red). A mixture of the three cell populations was injected into a mouse. Two weeks later, the mouse had developed a mammary-gland tumor that was composed of cells expressing the three FPs.

The images below show what happened when the researchers tried to visualize the tumor by stimulating each of its three FPs to fluoresce. As expected, efforts to cause fluorescence of tumor cells expressing the blue and green FPs failed to reveal the tumor. By contrast, tumor cells expressing the far-red TagRFP657 fluoresced brightly, clearly revealing—noninvasively—the tumor deep within the mouse.

Photoactivatable FPs: More versatile than ordinary FPs, photoactivatable FPs can be turned on or off with a pulse of light. Dr. Verkhusha has created several novel photoactivatable FPs, including PAmCherry, which goes from dark to red when exposed to a particular wavelength of light. Photoactivatable FPs are used mainly to mark a select population of protein molecules within a cell or to highlight whole cells of interest. Once their FPs are activated, these tagged proteins or cells can be followed in real time. For proteins in particular, photoactivatable FPs provide unsurpassed resolution for revealing their fate in single cells over both time and space. (See image on page 30, upper left.)

Photoswitchable FPs: These FPs change from one color to another after activation by a particular wavelength of light. There are two classes: reversible photoswitchable FPs, which can repeatedly be turned off (dark) and on (e.g., green) with pulses of light, and
irreversible photoswitchable FPs, which change color only once. In practice, researchers use photoswitchable and photoactivatable FPs for similar purposes. Dr. Verkhusha developed the first irreversible photoswitchable FP, called PSCFP, which changes from blue to green. More recently he developed Dendra, an irreversible photoswitchable FP that changes from green to red. (See image on page 30, upper right.)

**Fluorescent timer FPs:** These are FPs that change color over time. Until recently, fluorescent timer molecules were so big that they were useful only for tagging entire cells. In a major advance, Dr. Verkhusha’s lab has developed a new class of fluorescent timers, called monomeric fluorescent timers, which are small enough to tag individual proteins and which change color (blue to red) at different speeds: “Slow” fluorescent timers take nearly a day to change color, “medium” timers change color in about 12 hours and “fast” timers change from blue to red in a few hours. The ratio of blue to red timers can indicate, for example, whether most of the molecules of a tagged cellular protein are old or newly synthesized or whether new and old proteins have localized to the same or different regions of a cell. (See images on page 31.)

**The FP clearinghouse**

To help researchers who want to use these imaging tools, Dr. Verkhusha and Erik Snapp, Ph.D., assistant professor of anatomy and structural biology, have established the Fluorescent Protein Resource Center at Einstein. The center serves as an information clearinghouse for FPs and assists researchers in choosing the best FPs for their experiments. The advice is crucial, since FPs can be tricky to use—failing to fluoresce in some cellular environments and creating unwanted artifacts in others.

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**FRET, PALM and Intracellular Intimacy**

For today’s optical microscopists, observing the proximity of different molecules within a cell can provide crucially important information. Proteins that bind together, for example, may be involved in an enzymatic reaction, while proteins that migrate to the same organelle may be participating in the same biochemical pathway. Dr. Verkhusha’s FPs are used in two techniques that allow researchers to visualize two different molecules that are much less than a hair’s breadth from each other.

**FRET (fluorescence resonance energy transfer)** imaging can resolve two molecules that are bound together in a cell or otherwise extremely close together—from zero to five nanometers (five billionths of a meter) apart. The “ET” in FRET refers to the maximal “energy transfer” that occurs when molecules containing blue and green FPs are close together: The blue FP transfers its energy to the green FP—dimming the blue, brightening the green and confirming a close encounter. Conversely, as shown in the image below, FRET signaling disappears—and the color shifts from green to blue—when two once-close entities separate.

In 2008, Dr. Verkhusha and colleagues published a paper in *Chemistry & Biology* showing that FRET imaging can be used to detect apoptosis—the orderly (genetically programmed) cell death that can occur in response to viruses, toxins or other stressors. The enzyme caspase-3, activated during apoptosis, carries out the death sentence by degrading cellular proteins.

In this experiment, human cancer cells have been manipulated into expressing a “sensor” protein consisting of a blue FP on one end, a green FP on the other and a peptide sequence in the middle that caspase-3 targets when it degrades proteins. At the start of the experiment, the four cells shown in the images below were exposed to a drug that triggers apoptosis. The cells were then followed for 150 minutes.

The upper panels consist of overlaid images of the blue and green FPs at different times in the four cells. The transition in color indicates apoptosis in action: as increasing numbers of sensor proteins are cleaved, their blue and green FPs drift apart, causing the color to shift from green to blue.

In the lower panels, the four cells have been analyzed to detect the FRET signaling produced by the proximity of the green and blue FPs. In these pseudo-colored images, red indicates maximal FRET signaling (i.e., the green and blue FPs are practically touching), while blue indicates minimal signaling (i.e., the FPs have drifted apart). The change from red to blue over the 150-minute period depicts the destruction wrought by caspase-3 during apoptosis.
“FPs are large compared to the proteins to which they are attached, which means that an FP can sometimes block a protein from binding to its intended target,” says Dr. Snapp. “You still see the protein fluoresce, so you assume everything is fine, but the FP that the protein is lugging around has actually rendered the protein inactive. That is why it’s essential, whenever we fuse an FP to a protein, to have assays that can tell us whether the FP is interfering with the protein’s known function.”

Two of Dr. Snapp’s graduate students are working on strategies for surmounting the limitations of FPs. They recently discovered a technique for ensuring that FPs assume their characteristic barrel shape (required for fluorescence to occur) when they’re deployed to the periplasm of bacteria. This space between the inside and outside membranes of gram-negative bacteria is often hostile to FPs, preventing them from fluorescing.

### Everything is illuminated

Today, Dr. Verkhusha’s FPs are glowing in laboratories all over the Einstein campus. Dr. Snapp uses them in his own research to study the endoplasmic reticulum (ER), a membranous cytoplasmic network where secretory proteins (e.g., hormones and signaling molecules) are folded into their proper shape—an essential task carried out by molecules known as chaperone proteins.

Protein folding appears to go awry in Huntington’s disease, the fatal inherited neurological disorder caused by a gene mutation that creates a defective form of the huntingtin protein. In the cytoplasm, defective huntingtin protein and other misfolded proteins destined for degradation are nudged into large protein complexes called proteasomes. But huntingtin appears to cripple the function of proteasomes, with potentially serious consequences for the cell.
By impairing proteasome activity in the cytoplasm, could defective huntingtin cause proteins that need degrading to back up inside the ER and damage cells? Efforts to address that question could lead to new treatments for Huntington’s disease by identifying new therapeutic targets.

The photoactivatable FP images above are from a study in which postdoc Patrick Lajoie of Dr. Snapp’s lab used two FPs to see if he could simultaneously monitor, in real time, two possibly related cellular activities: the turnover of a toxic cytoplasmic protein such as huntingtin and the buildup of misfolded proteins in the ER. The red FP is PAmCherry, the photoactivatable FP developed by Dr. Verkhusha’s lab; the green FP is GFP. (These images also appear on the front cover and contents page of the magazine.)

In the top image above, exposing two live human cells to blue light has caused GFP to fluoresce bright green. GFP is tagged to BiP, an important chaperone protein that binds to misfolded proteins and is used here to detect misfolded-protein buildup in the ER. Since BiP resides in the ER, its fluorescence reveals the cells’ extensive ER network. The lower image, taken later, shows the same two cells after illumination for one minute with near-ultraviolet light of 420 nm wavelength. The photoactivatable FP PAmCherry, which can be attached to a toxic protein such as huntingtin, was readily activated, changing from dark to bright fluorescent red and becoming visible throughout the cells’ nuclei (large red areas) as well as the cytoplasm. These studies have revealed that synthesis of defective huntingtin protein increases the misfolded-protein burden in the ER.

In the Gruss-Lipper Biophotonics Center, Dr. Condeelis uses a custom-built microscope in combination with FPs to study metastasis—the migration of malignant cells into the bloodstream and then to the lungs, liver or other vital organs. Cancer patients don’t usually die from their original (primary) tumors but rather from tumors “seeded” by metastatic cells. Dr. Condeelis has done pioneering research in breast cancer metastasis, deciphering signaling pathways within the tumor microenvironment that guide cancer cells on their deadly journey.

In a paper published in *Nature Methods* in 2008, Dr. Condeelis and colleagues observed the movement of breast-tumor cells in living mice. Tumors were tagged with Dendra, an irreversible photoswitchable FP developed by Dr. Verkhusha that changes from green to red following exposure to blue light. Then, when the researchers photoswitched certain regions of the tumor, they were able to track single tumor cells over the course of several days.

The irreversible photoswitchable FP image above shows the position of breast-tumor cells 24 hours after parts of the tumor were photoswitched. Nonphotoswitched tumor cells have remained green. (Blood vessels are stained blue [outlined by white dotted lines] and the extracellular matrix is stained purple.) The photoswitched (red) cells can clearly be seen to have invaded the surrounding microenvironment—including nearby blood vessels—during that 24-hour period.

“Without FPs, you wouldn’t have this level of resolution,” says Dr. Condeelis, cochair and professor of anatomy and structural biology, codirector of the Biophotonics Center and holder of the Judith and Burton P. Resnick Chair in Translational Research. “All of the other clinical imaging methods—MRI, PET, CT, ultrasound—provide information only about gross anatomy, not about the cellular microenvironment. With our setup, it’s crystal clear.”

Another Einstein scientist, Ana Maria Cuervo, M.D., Ph.D., professor of developmental and molecular biology, of anatomy and structural biology, and of medicine, is a leading authority on autophagy—the cellular “housekeeping” process in which worn-out or defective proteins are digested in sac-like, enzyme-filled structures called autophagosomes.
lysosomes; the proteins’ amino acids are then recycled. Evidence increasingly suggests that glitches in autophagy underlie the degenerative changes associated with aging as well as diseases such as Huntington’s and Parkinson’s. Dr. Cuervo is researching strategies for reviving up autophagy when its efficiency declines.

In one type of autophagy, molecules bearing proteins that are destined for recycling dock with LAMP-2A, a protein receptor on the lysosomal membrane. This crucial step allows the protein to pass into the lysosome for digestion. In a *Nature Chemical Biology* paper published in 2009, Dr. Cuervo and other Einstein researchers used a fluorescent timer FP to address a long-standing mystery: the sequence of events between LAMP-2A’s synthesis and its arrival at lysosomes.

The gene for LAMP-2A was fused with the gene for Dr. Verkhusha’s medium-speed blue-to-red fluorescent timer FP, and the fused gene was inserted into human cancer cells. This gene was allowed to synthesize fusion protein (consisting of LAMP-2A and the fluorescent timer FP) for seven hours.

The fluorescent timer FP images, above right, show how LAMP-2A localized in the cell at various times (from one to 63 hours) after protein synthesis was halted. The newly synthesized fusion protein changed gradually from blue to red over time. Based on the red-to-blue ratios observed for fusion protein at different times in different parts of the cell, the researchers concluded that LAMP-2A prefers a roundabout route to lysosomes.

Following LAMP-2A’s synthesis, its traffic pattern takes it to the Golgi (organelles that add carbohydrates to proteins), the plasma membrane (the cell’s outer membrane), early endosomes (membranous structures that funnel molecules from the plasma membrane to internal parts of the cell), late endosomes and, finally, lysosomes. The blue and red forms of LAMP-2A/fluorescent timer FP are shown here as green and red pseudocolors, respectively.

Thankfully, *A. victoria*, the glowing Pacific jellyfish that sparked the GFP revolution, was in ample supply when it was studied 50 years ago. Unfortunately, thousands of other species have become extinct since then. Who knows how those losses will hamper efforts to cure disease? E

To attach an FP to the protein they want to follow, researchers must fuse the FP’s gene to the gene for that protein. Expression of this fused gene forms the protein of interest along with its attached FP tag. Vladislav Verkhusha, Ph.D., left, and Erik Snapp, Ph.D., center, have established the Fluorescent Protein Research Center to help Einstein scientists choose the optimal FPs for their research and create successful fusion proteins.
Beset by dire health needs, many underdeveloped countries confront daunting challenges in providing adequate medical care to their citizens. So it’s hard to picture such countries with their own scientists conducting laboratory and field studies that address local health problems. Nevertheless, Einstein scientists traveled recently to Africa to help two such countries—Rwanda and South Africa—achieve that vision.

The two Einstein teams were engaged in “capacity building”—an unglamorous term for educating and training local healthcare professionals and scientists so they’ll become skilled researchers. In both cases, the teaching efforts were motivated by the HIV/AIDS epidemic that has devastated so much of Africa—and by Einstein’s mission to improve human health locally and nationally as well as globally.
HIV/TB: An Unprecedented Challenge in South Africa

With more people infected with HIV than any other country, South Africa qualifies as ground zero of the AIDS epidemic. Adding to their woes, many HIV-infected South Africans (particularly those in rural areas) are coinfected with new strains of extensively drug-resistant tuberculosis (XDR-TB) bacteria—a viral/bacterial combination that often proves lethal.

So it’s understandable that Harris Goldstein, M.D., professor of immunology & microbiology and director of the Einstein/Montefiore Medical Center’s Center for AIDS Research (CFAR), traveled to South Africa earlier this year. “The intersection of HIV with these new resistant strains of TB poses an unprecedented health challenge,” he notes. More surprising was the reason for his visit: to teach a course in basic immunology to graduate students and faculty at the Nelson R. Mandela Medical School in Durban.

The trip stemmed from a conversation he had had several months earlier with Bruce Walker, M.D., Dr. Goldstein’s CFAR counterpart at Harvard. They discussed Dr. Walker’s efforts to attract graduate students and faculty at Mandela Medical School to participate in clinical research at the KwaZulu-Natal Research Institute for Tuberculosis and HIV (K-RITH), which opened recently on the medical school’s Durban campus—in the heart of the HIV and TB pandemics.

Still under construction, K-RITH houses an international research collaboration involving scientists from Einstein, Harvard, Mandela Medical School and the University of KwaZulu-Natal. It is supported by a $60 million, 10-year grant from the Howard Hughes Medical Institute (HHMI) and is being built with two goals in mind: to make major scientific contributions toward controlling the HIV/TB coepidemic and to train a new generation of scientists in Africa.

“Bruce told me that the students and faculty at Mandela needed a better understanding of basic immunology as well as mentoring in how to conduct research...I responded by asking, ‘How can I help?’ Since I direct and teach the majority of the lectures in the basic immunology unit for Einstein’s medical students, I suggested that I could teach a similar course in South Africa. Bruce enthusiastically accepted my offer.”

Last January, Dr. Goldstein embarked on a whirlwind seven-day trip to Durban: a day each way in the air, one day to relax and four days giving 14 lectures in basic immunology in just four days. The sessions were videotaped (see web link above), and DVDs were sent to those who could not attend.

Dr. Goldstein took his course on the road: 14 lectures in basic immunology in just four days. The sessions were videotaped (see web link above), and DVDs were sent to those who could not attend.


ON THE WEB
To view Dr. Goldstein’s K-RITH lecture series, visit www.einstein.yu.edu/goldstein2010/video


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Harris Goldstein, M.D., director of the Center for AIDS Research at the Einstein/Montefiore Medical Center, was recently named the first holder of the Charles Michael Chair in Autoimmune Diseases. Dr. Goldstein’s new chair was made possible by a generous gift from Charles Michael, a private investor who lives in San Francisco.

Dr. Goldstein notes that the immune system is inextricably linked to HIV/AIDS. “HIV infects, multiplies inside of and destroys immune-system cells—the T cells—that help ward off infections,” he explains. “That’s why HIV-infected people are so susceptible to developing TB: Their loss of T cells leaves them unable to protect against infecting TB bacteria.”

Moreover, he notes that HIV infection is a well-known cause of autoimmune disease—a result of HIV dysregulating the immune system and causing it to attack an infected person’s own tissues.

“HIV-induced autoimmunity is particularly common among AIDS patients started on highly active antiretroviral therapy, the standard treatment for virtually all Americans diagnosed with HIV/AIDS,” he says.

According to the American Autoimmune Related Diseases Association, there are 155 autoimmune and autoimmune-related diseases, including diabetes, Graves’ disease, lupus, ulcerative colitis, multiple sclerosis, Addison’s disease and scleroderma.

Mr. Michael noted that medical research remains underfunded. “It has come to my attention several times in recent years,” he says, “that autoimmunity is a field where lack of improvement in patient outcomes continues.” Before endowing the autoimmune diseases chair, Mr. Michael had received “many high commendations” about the work of Harris Goldstein. He also spoke to Dr. Goldstein and perused some of his papers, and was impressed with what he heard and read.

“Another significant factor in my decision to fund the chair at Einstein is its excellent reputation in the field of medical research,” says Mr. Michael.

He follows in the footsteps of his late parents, Erna and Jakob Michael, who were generous supporters of Einstein.
who either were doing HIV research or were planning to.

“It was a huge amount of material for people to absorb in a very short time, but we got fantastic feedback,” says Dr. Goldstein. “People came up to me and said, ‘I’ve been doing this research project, and before hearing the lectures I just didn’t understand the context of it. This really helped me.’ Others said they’d come up with new ideas after gaining a more detailed understanding of how the immune system works. It really generated momentum, empowering people to become investigators and getting them excited about research.”

Downplaying his own role, Dr. Goldstein cites several other Einstein researchers associated with K-RITH who are directing clinical and laboratory programs: William R. Jacobs Jr., Ph.D., professor of microbiology & immunology and of genetics and an HHMI investigator; Sarita Shah, M.D., assistant professor of medicine and of epidemiology & population health; and Neel Gandhi, M.D., assistant professor of medicine and of epidemiology & population health. All three have received major NIH grants in the last year to support their work (see page 14).

### Cultivating AIDS Investigators in Rwanda

At almost the same time Dr. Goldstein was teaching basic immunology in South Africa, five other Einstein faculty members were 900 miles to the north, in rural Rwanda. They were spending a month teaching the basics of clinical research to 13 Rwandan physicians and scientists.

The course was supported by a five-year AIDS International Training and Research Program (AITRP) grant awarded by the NIH to Vinayaka Prasad, Ph.D., professor of microbiology & immunology at Einstein. The goal: to help the Rwandan health professionals develop into skilled AIDS investigators who will become research leaders in this small African country.

The course’s location—a small hotel nearly 40 miles outside Kigali, the Rwandan capital—was chosen for a reason: its out-of-the-way setting made it less likely that the physicians attending the course would be called back to Kigali for emergencies and have to miss classes.

The course curriculum was a condensed version of the six-week summer session of Einstein’s Clinical Research Training Program (CRTP), a two-year program leading to a master’s degree in clinical research methods. Classes were held five days a week from 8 a.m. to 5 p.m., with a lunch break and two tea breaks daily. Four faculty members—plus one Einstein student—took turns at the lectern and shared their expertise:

- **Hillel Cohen, Dr.P.H., M.P.H.,** associate professor of epidemiology & population health, taught biostatistics.
- **Ethan Cowen, M.D.,** assistant professor of emergency medicine and of epidemiology & population health, taught bioethics. (Dr. Cowen graduated from the Einstein CRTP several years ago.)
- **Aileen McGinn, Ph.D.,** assistant professor of epidemiology & population health, taught data analysis.
- **Michael Mulvihill, Dr.P.H., M.P.H.,** professor emeritus in the departments...
Jean-Claude Dusingize, M.D., a Rwandan native and currently a CRTP candidate at Einstein, helped explain material to students in their local language (Kinyarwanda) and also taught them Stata, a difficult-to-master statistical software package.

The Einstein team was led by Kathy Anastos, M.D., a professor of medicine and of epidemiology with extensive experience in Rwanda. Dr. Anastos first visited the country in 2004, at the invitation of a women's group in urgent need of treatment for its HIV-positive members.

A decade earlier, these women had survived the rape and sexual violence of the Rwandan genocide, in which some 800,000 people were killed. So Dr. Anastos set up a program, the Women’s Equity in Access to Care and Treatment (WE-ACTx), to help women obtain testing and treatment for HIV infection. WE-ACTx has since evolved into a uniquely Rwandan enterprise, relying on local nurses to provide high-volume, high-quality care for HIV-positive people.

More than six years after that first trip to Rwanda, Dr. Anastos clearly remembers what one rape victim told her just before she left: “You know, a lot of people come to visit, and nobody comes back.” Dr. Anastos has since returned to Rwanda more than two dozen times, continuing her work with WE-ACTx and organizing cohort studies of HIV-positive women undergoing therapy. In fact, a prime resource for the Rwandan clinical training program was the wealth of data from one of her recently completed studies—the Rwanda Women’s Interassociation Study and Assessment (RWISA).

RWISA had enrolled women who were starting treatment for HIV infection, many of them drawn from the WE-ACTx treatment programs. At the outset of the study, nurses recorded the women’s histories and vital statistics and also took blood samples for analysis. Follow-up exams occurred at six-month intervals for the next three years.

“The data were solid, but no one had had the time or the expertise to analyze them,” says Dr. Anastos. “So we organized our 13 trainees into four research groups and gave them data sets from RWISA—the histories, the physical exams and the results of the baseline blood work. They then applied the research skills they were mastering in the classroom to analyze, organize and generally make sense of the data.”

One group, for example, decided to compare how the different initial antiretroviral therapies taken by RWISA participants affected kidney and...
“Once we’re able to see how the patients’ lab results changed over time, we’ll be better able to make predictions, such as how patients on particular drug regimens are likely to fare.”

Liver function. Another group studied whether the incidence of shingles—the painful flare-up of dormant Herpes zoster virus that can signal immune-system dysfunction—was higher among the HIV-positive women in RWISA than among HIV-negative women.

Blood samples drawn on the patients’ follow-up visits have not yet been analyzed but soon will be, thanks to recently acquired funding. “The team is eagerly awaiting the results on those frozen blood samples,” says Dr. Mulvihill, the epidemiologist in the group. “Once we’re able to see how the patients’ lab results changed over time, we’ll be better able to make predictions, such as how patients on particular drug regimens are likely to fare.”

By all accounts, the four-week program was a great success. “All the trainees were extremely dedicated, studying not only when we were there to support them but also well into the evenings,” says Dr. Anastos.

The Einstein faculty is staying in touch with its students via e-mail and will offer follow-up training through teleconferences and additional in-country workshops. In the near term, they’ll be helping the trainees write up their analyses of the RWISA data and publish those results in peer-reviewed journals.

“As our trainees’ research skills improve and data on the follow-up blood samples become available,” says Dr. Anastos, “we’d like them to progress from those fairly simple research questions to more urgent matters. For example, are there changes in blood counts over time that predict who will do well on antiretroviral therapy—or, conversely, predict who is likely to die despite treatment?”

“We know the answers to some of these questions for patients in the United States and Europe but we don’t have a lot of good data coming out of Africa,” says Dr. Anastos. “So these students could make a real contribution to their country.”

Many women who survived the rape and genocide in Rwanda a decade ago are now HIV positive. A public health center outside Kigali offers comprehensive prenatal care.

The Rwandan research training program has already created positive ripple effects:

• One of the Rwandan trainees—Jean D’Amour Sinayobye, M.D.—was recently accepted into Einstein’s two-year Clinical Research Training Program. “Finding Dr. Sinayobye and recruiting him to Einstein’s CRTP is exactly the sort of outcome we envisioned when we initiated this in-country training program,” says Dr. Prasad, whose AITRP grant paid for the program.

• Einstein physicians Lisa Nathan, Marla Keller and Johanna Daily have received pilot grants from Einstein’s Global Health Center to work with Dr. Anastos in Rwanda. Also working with Dr. Anastos will be Einstein researcher Elizabeth Kiefer, M.D., who has received a pilot grant from the Einstein/Montefiore CFAR to examine how nutrition and antiretroviral therapy affect inflammation among Rwandan women.

• Richard Sezibera, M.D., the Rwandan minister of health, has suggested that Einstein pursue more extensive collaborations with Rwandan healthcare professionals.

More about Einstein in Rwanda at www.einstein.yu.edu/rwanda2010
Arturo Casadevall + Ekaterina Dadachova
The partnership between Einstein’s Arturo Casadevall and Ekaterina (Kate) Dadachova—10 years old and going strong—is one of the most fruitful in the College of Medicine’s history. The 50 papers they’ve published are impressive by any standard. But in this age of research specialization, what really stands out is the sheer variety of their ventures, among them a potential weapon in the fight against HIV/AIDS, deploying melanin to shield against ionizing radiation, and a promising treatment now in clinical trials for metastatic melanoma.

The researchers arrived at Einstein by very different routes.
Arturo Casadevall was born in the city of Sancti Spiritus in central Cuba. He and his family emigrated to the United States as political exiles when he was 11. From age 16 to age 20, he worked at a Queens McDonald’s four nights a week. “It was a major formative experience,” he recalls. “Everything in McDonald’s is a team effort, from the person who chops the lettuce to the ones who clean up the trash. I learned a lot about life there.”

After enrolling at Queens College (“the only place I could afford—it was free at the time”), Arturo got what he calls his “lucky break”: acceptance into the M.D./Ph.D. program at New York University (NYU) School of Medicine, with a scholarship that provided tuition. “I had taken a summer elective in research at Queens College and realized I really liked it—the open-endedness of the work,” says Arturo. “But I didn’t know you could have a career in research. In the milieu in which I grew up, people either taught or worked for the city or owned a bodega. Here was this whole new line of work I’d never heard of, allowing me to combine medicine with an investigative career.”

Arturo spent nine years at NYU, the last three as a resident in internal medicine at Bellevue. “During my third year of residency, I realized I’d been away from the laboratory for a long time,” says Arturo. “In those days we had a lot of elective time that we could convert into laboratory time. So I told Dr. Saul Farber, NYU’s chairman of medicine, that I wanted to do research and had been accepted to the infectious disease program at Einstein and Montefiore. “He didn’t want me to leave, noting that I still had clinical and on-call responsibilities at Bellevue as part of my residency. But I kept insisting, and he finally asked, ‘Who would you work with over there?’ When I said I wanted to work with Matty Scharf, his eyes opened wide and he said, ‘Oh—he’s one of our own,’ meaning Matty had graduated from NYU and had maintained his contacts there. To Dr. Farber, that meant that I wasn’t really leaving—which is how I ended up here.”

Since arriving at Einstein in 1989 as a postdoctoral fellow, Arturo Casadevall, M.D., Ph.D., has distinguished himself as an infectious-disease researcher, lecturer and mentor. His lab carries out research on how fungi cause disease, focusing on Cryptococcus neoformans, a pathogen that can cause fatal infections in AIDS patients and other people with weakened immune systems. He is now professor and Leo and Julia Forchheimer Chair in Microbiology & Immunology and chair of the department.

Kate Dadachova was born and raised in Moscow. As a child, she aspired to a show-business career. “I liked to sing and dance and wanted to go into the Moscow music hall,” says Kate. “But my parents told me to be serious—to get an education and a profession. I eventually enrolled in the chemistry department at Moscow State University. It’s probably just as well. Otherwise I could have ended up as a chorus girl.”

Kate stayed on at Moscow State for four more years—1988 through 1992—to pursue a Ph.D. in physical chemistry. The Soviet Union was dissolving, and the Russian economy was in chaos. “It was an exciting time, but it was also very harsh,” says Kate. “Although we didn’t realize it at the time, we were very close to confronting hunger—real hunger. Every day the food lines were miles long for basic necessities such as milk, bread and cooking oil. Food lines, of course, were nothing new in the former Soviet Union. But it was one thing to stand in line for 30 minutes and another to have to do it for three hours a day, as was common then. I was working on my Ph.D., but I stood in line too. I had to eat.”

After earning her Ph.D., Kate left Russia for Australia and looked for a postdoc program. “But when I arrived, Australia was in the midst of an economic recession,” says Kate. “There were very few jobs in science, and nothing in physical chemistry.” Then she spotted an ad for a postdoc position...
An interview with
Arturo and Kate

How did your collaboration begin?
Kate: I approached Arturo toward the end of 2000—very soon after I arrived at Einstein—and told him of my interest. I had absolutely no knowledge of infectious diseases, but it seemed to me that radioimmunotherapy could help in treating them. After all, no effective antibiotics exist for many infections. Arturo could easily have brushed me off—many such conversations lead nowhere. But he was willing to work with me.

Arturo: I was intrigued—no one had tried radioimmunotherapy against infections before. I didn't know whether it would work, but it sounded worth investigating. My lab had already made antibodies to an antigen found in Cryptococcus neoformans and we had an animal model for the infection, two things Kate needed for radioimmunotherapy.

Kate: In our first paper, in the Proceedings of the National Academy of Sciences in 2003, Arturo and I reported that radioimmunotherapy helped against infections caused by Cryptococcus. Then, working with Liise-anne Pirofski, we achieved good results using radioimmunotherapy against Streptococcus pneumoniae bacteria.

How is that work involving fungal and bacterial infections progressing?
Arturo: Actually, that's been put on the back burner, because our later research endeavors—using radioimmunotherapy against incurable metastatic melanoma, for example—became more important.
What’s the best part of your partnership?

Arturo: To me, the real gem of our collaboration is that we’ve found ways to continually expand into other areas. For example, my lab also does research in biodefense, which involves using antibodies for defense against biological warfare agents such as anthrax. With her expertise in connecting antibodies to other molecules, which is required in radioimmunotherapy, Kate has helped us determine binding affinities of antibodies to microbes and their toxins. And she has helped us out on a lot of other things on that project that we would not otherwise have been able to do.

Does personality play a role in a successful partnership?

Arturo: Absolutely. In human dealings, almost everything ultimately comes down to the personal, and people have to get along. I think one reason we’ve been able to maintain a productive collaboration for so many years is that we’re both inherently very generous people: I don’t care which of us gets the credit, and Kate feels the same way. What matters is that the work gets done. We’re on this earth for only a short time, and I think we both feel that we should try to leave it a little better than we found it.

You mentioned the importance of your melanoma work. What does it involve?

Kate: We take monoclonal antibodies against melanin pigment and attach them to the radioactive isotope rhenium-188. The idea is for the antibodies to seek out and selectively bind to melanoma tumors inside the body and for the isotope to then deliver a powerful dose of radiation to the tumor sites.

What’s the status of the research?

Kate: Our radioimmunotherapy technology for melanoma was licensed to a California biotech company, which has been testing it on patients with the most severe type of metastatic melanoma. This past March the company, Pain Therapeutics, Inc., announced results of two phase 1 clinical trials conducted in Israel—one for 6 weeks, the other for 14. Phase 1 studies are meant only to establish safety, but they found good evidence that the therapy was not only safe but also killed melanoma tumor cells. Combining the data from the two phase 1 studies showed that the 19 treated patients had a median survival time of 13 months compared with the typical 9 months—nearly a 50 percent improvement. Plus, for almost all patients, tumors either shrank or didn’t grow. There is no satisfactory treatment for metastatic melanoma, so we’re very encouraged by these early clinical results.

Would this be the first successful use of radioimmunotherapy against cancer?

Kate: For solid tumors, yes. Compared with “liquid” tumors such as leukemia and lymphomas, solid tumors have proven much more resistant to radioimmunotherapy, basically because their tumor cells are not as accessible to the antibodies. Everybody had thought it probably wasn’t worth trying against solid tumors—particularly melanoma, which was notoriously resistant to other types of radiation.
So what led you to try it?

Arturo: That’s a story that illustrates the value of basic science, and how research in one area can really impact a totally unrelated field. Around 1997 my lab was studying fungi that produce melanin during infection, and we made an antibody to fungal melanin produced by *Cryptococcus neoformans*. Dr. Josh Nosanchuk was an important collaborator on those early studies with fungal melanin. That work had nothing to do with melanoma. We were investigating whether *Cryptococcus* makes melanin when it infects tissue. And since melanin is a very hard compound to identify, we thought that making antibodies would help us find melanin and label it. Then we tested whether our antibody would react with other melanins, including human melanin, and it did. That’s where things stood when Kate arrived here in 2000 with her radioimmunotherapy expertise. We later began discussing the possibility of targeting melanin in melanoma. Since we already had this antibody to melanin, it seemed obvious to match the antibody up with a radioactive isotope and give it a shot against melanoma.

Did you see some chink in melanoma’s armor that radioimmunotherapy could exploit?

Arturo: I remembered hearing that tumors contain a lot of dead cells. In melanoma tumors, the dead cells would be filled with melanin pigment. I had a hunch that when those dead cells disintegrated, their melanin would spill out and become accessible to the antibodies and their attached isotopes. Since melanoma tumors grow very aggressively, rapid cell turnover should mean many dead tumor cells and a lot of melanin pigment for radioimmunotherapy to target. Once the antibody penetrates the tumor and latches onto the released melanin, the radiation emitted by the isotope should kill nearby tumor cells.

Wasn’t there a danger that the antibodies might target melanin in skin cells or eye cells?

Arturo: One of the nice things about the therapy is that only free melanin is targeted, not melanin inside cells. In healthy human cells, melanin pigment is encased in structures called melanosomes that provide excellent protection.

Fungal melanin seems to have launched you into several different research areas. How did your most recent collaboration—using melanin to protect against ionizing radiation—come about?

Arturo: Back in 2002 I saw a story on the Web about the damaged Chernobyl nuclear reactor that was still too “hot” for humans to enter. A robot sent into the reactor returned with samples of black, melanin-rich fungi growing on the reactor’s walls. I found that very interesting. Melanin is well known for shielding against ultraviolet radiation—the protective role it performs for our skin. The fact that melanized fungi could survive and even thrive in the highly radioactive Chernobyl reactor suggested that melanin might also block ionizing radiation.

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highly radioactive Chernobyl reactor suggested that melanin might also block ionizing radiation—which could serve many useful purposes, from shielding patients undergoing radiation therapy to protecting astronauts against radiation exposure in space.
What happened next?

Kate: We found two mechanisms that may explain how melanin works against radiation. Melanin helps prevent the formation of free radicals, which cause DNA damage, and it scavenges the free radicals that do form. Then we looked at melanized fungal cells using electron microscopy and saw that the melanin in fungal cells is arrayed on hollow spheres that look like nanoparticles. That gave us the idea of creating “melanin nanoparticles” as a strategy for protecting bone marrow from the harmful effects of radiation therapy. We took tiny silica particles—grains of sand just 20 nanometers in diameter—and coated them with several layers of melanin pigment.

Astronauts might be able to rely on fungi as an inexhaustible food source on long missions.

Why focus on bone marrow?

Kate: That’s where blood is formed. And the bone-marrow stem cells that produce blood cells are extremely susceptible to the damaging effects of radiation—one of the main reasons doctors must limit the radiation dose. A technique for shielding bone marrow would allow patients to receive higher doses of radiation to their tumors, making the treatment more effective. Earlier this year, we reported promising results in a study using a mouse model. Mice that got infusions of the melanin particles and were then exposed to whole-body radiation experienced much less bone-marrow damage, as measured by the numbers of white blood cells and platelets, than radiation-exposed mice that weren’t pretreated with nanoparticles. We’re hopeful that this use of melanin will ultimately benefit patients.

Arturo: That Chernobyl story also led Kate and me in another direction. How, we wondered, could fungi thrive in that toxic environment? We hypothesized that melanin in fungi may possess a previously undiscovered talent: the ability to use radioactivity as an energy source for making food and spurring growth, much the same as chlorophyll in plants makes energy from sunlight. Our 2007 PLoS ONE paper provided good evidence to support that idea. In one experiment, we took three genetically diverse fungi and found that ionizing radiation significantly enhanced the growth of fungi that contain melanin.

What are the implications of fungi feasting on radiation?

Arturo: They’re pretty startling, since we’ve long assumed that fungi exist mainly to decompose matter into chemicals that other organisms can use. Consider that the fungal kingdom comprises more species than any other plant or animal kingdom and that most fungi contain melanin. If fungi are making food in addition to breaking it down, that means Earth’s energy balance—in particular, the amount of radiation energy being converted into biological energy—may need to be recalculated.

Kate: There are some intriguing practical implications too. For example, since ionizing radiation is prevalent in outer space, astronauts might be able to rely on fungi as an inexhaustible food source on long missions. Maybe that’s why, of all of our papers, this one on radiation-eating fungi has aroused the most interest. Over the three years after its publication, 57,000 people downloaded the paper from the PLoS ONE website. Typically, scientific papers are read by several dozen people.

Getting back to radioimmuno-therapy, can you describe using it on cancers caused by viruses—which may be responsible for up to 20 percent of all cancer cases?
Kate: We’ve focused mainly on cervical cancer, which is caused by the human papilloma virus. Infected cells are transformed into cancer cells, which continue expressing, or producing, viral antigens. Our approach here is almost exactly the same as with melanoma: Some of the rapidly dividing tumor cells die and release viral antigens. The radioimmunotherapy homes in on those antigens and kills off surrounding tumor cells. We’re now trying to expand this approach to head and neck cancers caused by the human papilloma virus, which have a particularly grim prognosis. Funding comes from the $100,000 Mary Kay Ash Charitable Foundation Research Grant I received in 2008 and a pilot grant from the Einstein-Montefiore Center for AIDS Research. Arturo and I are collaborating on this project with Drs. Mark Einstein and Gary Goldberg, gynecologic oncologists at Einstein.

Of your many projects, do you feel that the biggest blockbuster could be your use of radioimmunotherapy against HIV/AIDS?

Arturo: It’s very exciting work, in which we’ve collaborated with Dr. Harris Goldstein, the director of the Einstein/Montefiore Center for AIDS Research. Our 2006 paper in *PLoS Medicine* showed that radioimmunotherapy could successfully target and destroy human immune cells infected with HIV, the virus that causes AIDS. The study was done in mice, but it supports the idea that radioimmunotherapy might help in treating people infected with HIV. More broadly, the study showed that radioimmunotherapy offers potential for treating the many viral infections, from hepatitis C to Ebola, in which viral proteins are expressed on the surface of infected cells.

Kate: With melanoma and viral cancers, our target was material released from dead cells. Here the antibody homes in on the viral protein gp41 on the surface of HIV-infected cells. Once the antibody binds to the gp41 on infected cells, radiation emitted by its attached isotope destroys the cells. This could be an advantage over drugs now used against HIV/AIDS. Those drugs help keep HIV from multiplying, but they can’t cure AIDS because they can’t do anything about latently infected cells in which the virus lurks and may later start multiplying. Since even these latently infected cells display some gp41 on their surfaces, we hope that radioimmunotherapy can destroy them as well.

What’s the status of that work?

Kate: The preclinical work—testing in animal models of HIV/AIDS—is complete. Einstein has licensed the technology to a biotech firm, and we are awaiting its decision on clinical trials.

In 10 years, you two have tackled more topics than most scientists touch on in their entire careers. Is there any unifying thread?

Arturo: All these projects built on our first successful collaboration. Once we learned we could work together and accomplish things together, the rest was somewhat like a research chain reaction—zigging and zagging but with a generally forward progression.

How would you summarize your partnership?

Arturo: It’s been remarkably successful and productive, which is pretty unusual. Many research collaborations don’t last much beyond the first paper—just look at Watson and Crick. I think the key to our success is that we both bring things to the partnership that allow it to be “one plus one equals three,” which is probably the way that really successful collaborations are made.
The Eloquent Instruments of Yesteryear

It started with a visit to an antiques shop. “My wife and I bought an old European pharmacy chest with several empty shelves, and soon we found ourselves buying old medicine bottles to put on them,” says M. Donald Blaufox, M.D., Ph.D., professor and chair of the department of nuclear medicine, professor of medicine and of radiology and longtime antiques lover. His first instrument acquisition was a 19th-century fleam (bleeder) purchased in New Orleans. Dr. Blaufox’s collection of about 1,000 instruments and objects (not including books and bottles) illustrates how radically the practice of medicine has evolved in recent centuries.

A number of common tools have faded into history. Bleeders were once standard equipment in doctors’ bags—which themselves became rarities with the decline of the house call. Also gone, fortunately, are various useless and sometimes dangerous patent medicines. Quackery, of course, remains to this day.

Although Dr. Blaufox’s collection spans the 16th to the 20th centuries, his personal favorite is the 19th. “It was a century of remarkable progress,” he says. “The stethoscope and blood pressure devices were developed, surgical innovations were born in response to the injuries of Civil War soldiers, and anesthesia and X-rays were discovered, along with asepsis—keeping things sterile,” he says. The new awareness of infection risk caused physicians to retire their handsome wood and ivory instruments in favor of coldly functional, sterilizable stainless steel tools—a boon for human health, certainly, but a loss for aesthetics.

Physician’s saddlebags, circa 1870. Before gas-powered vehicles arrived in the late 19th century, country doctors made their house calls on horseback. The strap connecting these two bags went over the horse’s back.

The Actina Eye Restorer, Catarrh and Hay Fever Cure, circa 1886. This quack cure’s maker, the New York and London Electric Association (located, inexplicably, in Kansas City, MO), claimed it would heal an improbable mix of ailments. We still don’t have a cure for hay fever and catarrh—also known as the common cold.

Homemade fleam (bleeding device), circa 1800. Bloodletting was thought to relieve the redness, heat and swelling of inflammation by reducing the blood supply and emptying engorged vessels, a practice now considered harmful. Some historians believe that bleeding contributed to the death of George Washington.
Dr. Blaufox amidst items from his collection. At left are a microscope and anatomically accurate papier-mâché model, both circa 1870. In front of Dr. Blaufox is a drawer from a materia medica cabinet, circa 1880, filled with natural substances used to formulate medications. Hanging on the wall are early 19th-century binaural stethoscopes.

More at www.einstein.yu.edu/blaufox2010

Visit Dr. Blaufox’s virtual Museum of Historical Medical Artifacts at www.mohma.org

Modified Laennec stethoscope, circa 1830. The first stethoscope, invented around 1816 by French physician René Laennec, was a foot-long wooden tube designed to spare the good doctor the impropriety of placing his ear against the chests of female patients. It could be unscrewed into two pieces and carried in a pocket. The one shown here is shorter and one piece.

Sphygmometer, circa 1880. In 1834, French physician Jules Hérisson invented the sphygmmometer, which measured blood pressure crudely by determining the amount of pressure required to obliterate the pulse. The device shown here is a sophisticated expression of that concept. In 1896, Italian internist Scipione Riva-Rocci invented the first accurate device, the sphygmomanometer, using an arm cuff to measure blood pressure.
In elementary school, he stood up for integration. In college, he actively opposed the Vietnam War. In the next years, “he functioned as a community organizer before Barack Obama popularized the term,” said Dean Spiegel when introducing Dr. Safyer, this year’s Commencement speaker.

To help finance his Einstein education, Dr. Safyer served in Montefiore’s Rikers Island Health Service. “On any given day, there were 5,000 patients with HIV,” he said. “The health needs were staggering, and I felt an opportunity to make a difference.” When drug-resistant tuberculosis appeared in the prison population, he and his colleagues developed a treatment program and fought for a state-of-the-art TB hospital at Rikers.

During his 28 years at Montefiore, Dr. Safyer has built specialty care programs and an extensive primary care network, developed innovative strategies to manage care and assume risk, and created nationally recognized quality and safety programs.

“The vibrancy of our democracy and the strength of our social fabric are undermined by a fragmented healthcare system that leaves individuals and families poorly served,” he said. “You, our graduates, have the opportunity to shape the world of opportunity that awaits you.”

Next, Allen M. Spiegel, M.D., Einstein’s Marilyn and Stanley M. Katz Dean, introduced Steven Safyer, M.D., as the “ideal Commencement speaker.” A member of Einstein’s Class of 1982, Dr. Safyer is a partner with the College of Medicine in his current role as president and chief executive officer of Montefiore Medical Center, the University Hospital and Academic Medical Center for Einstein. Dr. Safyer reminded the 2010 graduates of their new ability—and obligation—to make a difference. “You are receiving your degrees from a unique institution, with a strong and proud tradition of social activism and a commitment to improve the lives of many,” said Dr. Safyer. “Do not hesitate to give voice to your ideas and your ideals. Use your platform to speak to what is right.” (For more about Dr. Safyer, see the box at left.)

Candidates were led to the stage by Grand Marshal Stephen H. Lazar.
Ed.D., assistant dean of students (with many cute babies, adorable children and supportive “others” accompanying the graduates in their journey across the stage). Dean Spiegel and President Joel presented the diplomas, conferring 180 M.D. degrees, 50 Ph.D. degrees and 15 M.S. degrees. Eighteen graduates received both an M.D. and a Ph.D. degree. With these new graduates, Einstein now boasts a grand total of 7,729 M.D. and 1,248 Ph.D. alumni.

Members of the Class of 1960, Einstein’s second graduating class, were there to celebrate their 50th reunion. They were recognized with rousing applause for their pioneering role in Einstein’s history. In addition, several alumni received awards during Commencement. The honored alumni and their awards included: Herbert Tanowitz, M.D. ’67, the Dominick P. Purpura Distinguished Alumnus Award; Lynne Meryl Mofenson, M.D. ’77, and Sten H. Vermund, M.D. ’77, Alumni Lifetime Achievement Awards; and Noreen Kerrigan, M.P.A., associate dean for student admissions, the Lifetime Service Award for a Non-Alumna. (Three members of the Class of 1960 were given Alumni Lifetime Service Awards at the Gala Reunion Dinner held that evening: Robert Bernstein, M.D., Mervyn Goldstein, M.D., and Henry Pritzker, M.D. See page 51.)

As is traditional, the Commencement ceremony ended with the prayer of Maimonides, including these words: “Our work is great and the human mind presses forward forever. Thou hast chosen me in thy grace to watch over the life and death of thy creatures. I am about to fulfill my duty.” The Class of 1960 alumni stood with the new graduates as Dean Spiegel gave the prayer.

The day that Elan and Juliana Rosenblat received their M.D. degrees, daughter Abby turned 2. The doctors first met in nursery school.
Reunion 2010 Honors the Class of 1960

Smiles and hugs were the order of the day as Einstein alumni from classes ending in 5s and 0s gathered for Reunion 2010, which featured the milestone 50th anniversary celebration of the Class of 1960, Einstein’s second class of graduates. On Wednesday, June 2, a dinner welcoming members of the Class of 1960 was held at the Yeshiva University Museum at the Center for Jewish History in New York City.

According to Ronald Ross, M.D. ’60, chair of the Class of 1960’s 21-member Reunion Committee, “After ten months of planning by the Reunion Committee, our class was excited to return to Einstein to reconnect, reminisce and celebrate our 50th anniversary reunion.”

At Commencement exercises the next day, the Class of 1960 was honored by the Einstein community. Alumni from all reunion classes then headed to New York’s Grand Hyatt Hotel for a Gala Reunion Dinner. Dean Spiegel and several Einstein deans and faculty, including two of their former teachers, Milford Fulop, M.D., and Christine Lawrence, M.D., joined them. The Class of 1960 enjoyed dinner in a private room while the other classes dined together.

The highlight of the evening was the dramatic entrance of the 50th reunion class into the ballroom after the other classes were seated there. The members of the Class of 1960 proceeded to the stage to loud applause as Alumni Association President Stephen Goldstone, M.D. ’79, read out their names.

Dr. Goldstone thanked the 50th reunion class for being Einstein pioneers. He noted that two of the four women from the Class of 1960, Ruth Freeman, M.D., and Sandra Weiss Schwartz, M.D., were present, calling them “trailblazers.”

Dr. Ross, who spoke on behalf of the class at both Commencement and the Gala Reunion Dinner, remarked...
that “the Class of 1960 appreciates the recognition given to us at this year’s reunion. We are all grateful to Einstein for providing us with the education that allowed us to succeed in our careers.”

Dean Spiegel and Dr. Goldstone presented Alumni Lifetime Service Awards to Robert Bernstein, M.D. ’60, Mervyn Goldstein, M.D. ’60, and Henry Pritzker, M.D. ’60. They then introduced the 2010 Alumni Award recipients who had been honored at Commencement (see page 49). Representatives of each reunion class stood and gave brief reminiscences. The class representatives included Stanford Goldman, M.D. ’65; Herbert Kee, M.D. ’70; Howard Sobel, M.D. ’75; George Fulop, M.D. ’80; Russell Cohen, M.D. ’85; Neil Gordon, M.D. ’90; Rachel Katz-Sidlow, M.D. ’95; and Snehal Amin, M.D. ’00.

Reunion 2010 culminated in Alumni Leadership Brunch

On May 2, Dean Allen M. Spiegel hosted the annual Einstein Alumni Leadership Brunch at the Michael F. Price Center for Genetic and Translational Medicine/Harold and Muriel Block Research Pavilion.

The luncheon celebrated alumni whose cumulative lifetime gifts total $25,000 or more (the Dean’s Club giving level); those alumni who have now reached giving levels of $25,000, $50,000 and $100,000 were presented with special leadership awards by the dean. Also recognized were alumni who made a gift of $1,000 or more to the College of Medicine this year.

Guests toured the laboratories of Irwin Kurland, M.D., Ph.D., director of the Diabetes Center Metabolomics Core; Matthew Levy, Ph.D., assistant professor of biochemistry, and Simon Daniel Spivack, M.D., M.P.H., chief, division of pulmonary medicine, department of medicine.

Alumni Leadership Brunch

From left, Helen Ross, Ronald Ross, M.D. ’60, Annette Satloff, Aaron Satloff, M.D. ’60, Barbara Schapiro, Melvin Schapiro, M.D. ’60, at the Class of 1960 Gala Reunion Dinner.

Day on Campus, Friday, June 4. The morning featured an educational symposium chaired by Dr. Ruth Freeman for continuing medical education credit. Speakers included Dr. Freeman, Melvin Scheinman, M.D. ’60, Melvin Zelofsky, M.D. ’60, who received the Lifetime Achievement Award for Excellence in Teaching, and Dean Spiegel.
“It was an honor to plan and chair an educational symposium highlighting the differences in the medicine of 50 years ago and now. It is unbelievable how much change there has been since I was an Einstein student 50 years ago,” said Dr. Freeman.

Following lunch in Lubin and a presentation by Felise Milan, M.D. ’88, director of the new Ruth L. Gottesman Clinical Skills Center, Irwin Dannis, M.D. ’60, led a campus tour. The group visited the Clinical Skills Center and the Michael F. Price Center for Genetic and Translational Medicine/Harold and Muriel Block Research Pavilion, where they heard a presentation by William R. Jacobs Jr., Ph.D., professor of microbiology & immunology, about his tuberculosis research in Africa.

The alumni relations office is already hard at work planning for Reunion 2011, marking the anniversary reunions of classes ending in 1s and 6s, including the 50th reunion celebration for the Class of 1961. For more information or to get involved, please contact alumni@einstein.yu.edu or 718.430.2013.
Robert Sidlow, M.D., Rachel Katz-Sidlow, M.D. ’95, and David Kardon, M.D. ’95.

Mo M. Chen, Arnold Chen, M.D. ’85, Virginia Kee, and Herbert Kee, M.D. ’70.


Snehal Amin, M.D. ’00, Robin Kashan, and Glenn Kashan, M.D. ’00.

Touring the campus on Alumni Day.

William R. Jacobs Jr., Ph.D., describes his tuberculosis research to visiting alumni during Alumni Day on Campus.
**CLASS NOTES**

**1959 and 1960s**

**Louis M. Aledort, M.D. ’59**, the Mary Weinfeld Professor of Clinical Research in Hemophilia at Mount Sinai School of Medicine, received the prestigious Lifetime Achievement Award from the Hemophilia and Thrombosis Research Society last April, in recognition of his distinguished career and contributions to the field of blood disorders.

“In addition to being a renowned researcher in blood disorders, Dr. Aledort is a tireless advocate for the advancement of his peers, young physicians and investigators,” said Cindy Leissinger, M.D., professor of pediatrics and pathology and chief, section of hematology & medical oncology, Tulane University School of Medicine, who nominated Dr. Aledort. A pioneer in the field of coagulation disorders, Dr. Aledort has participated in many projects that have advanced scientific standards in research and patient care. He has studied the safety and effectiveness of treatments for bleeding problems; the blood disorder idiopathic thrombocytopenic purpura (in which the immune system destroys platelets); and bleeding related to anticoagulant therapy.

**Harvey L. Hecht, M.D. ’62**, received the Physician Recognition Award from Stamford Hospital in Stamford, CT. Dr. Hecht, who specializes in radiology and breast radiology, was nominated by fellow physicians and hospital personnel for the honor. The award is given to the physician who has shown an ongoing commitment to the hospital’s Planetree philosophy of patient-focused care and has been a role model to other staff members. It is inscribed, “Your exemplary skills as a physician, colleague and friend make us proud to work by your side.”

**Larry Bonchek, M.D. ’63**, retired in 1999 as founder and director of cardiothoracic surgery at Lancaster General Hospital in Lancaster, PA. Dr. Bonchek has been elected chair of the board of trustees of Franklin and Marshall College. He serves as editor-in-chief of the *Journal of Lancaster General Hospital* (www.jlgh.org) and as senior advisor for academic affairs at Lancaster General Health. He delivered the 2010 commencement address at the Lancaster General College of Nursing and Health Sciences.

**Sue Fried, M.D. ’64**, “continues to bounce back and forth” between Jerusalem and New York, keeping a hand in psychiatry with occasional locum positions.


**James Cleeman, M.D. ’68**, formerly with the National Heart, Lung and Blood Institute at the National Institutes of Health, is now senior medical officer at the Agency for Healthcare Research and Quality’s Center for Quality Improvement and Patient Safety, in Rockville, MD.

**Richard L. Myerowitz, M.D. ’68**, lives in Monroeville, PA (outside Pittsburgh), and works part-time as a community hospital pathologist. One of those communities—Punxsutawney, PA—is also home to a famous groundhog named Phil. “Unfortunately, I have no influence on the groundhog’s predictions,” he says. His oldest daughter is “back in the Big Apple” as the CFO of St. John’s University; his middle daughter is a pharmacist practicing in Richmond, VA; and his youngest daughter is director of a Hillel Center at the University of Sydney, Australia. “It would seem that the Myerowitz family has gone global! I am very sorry that I was unable to attend our 40th reunion in 2008.”

**Larry J. Platt, M.D. ’68**, writes that this year marks the 40th anniversary of the National Health Service Corps, “which started as a proposal I wrote in off-hours so that I could feel I was doing something useful while fulfilling my draft obligation as a ‘two-year officer’ in the U.S. Public Health Service.” He says he is “even more proud” of his two daughters, who came along later, and adds, “Someday, I hope to be able to afford retirement, but for now I am still engaged in one of the many forms of public health service.”

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**Harvey L. Hecht, M.D. ’62**, received the Physician Recognition Award from Stamford Hospital in Stamford, CT. Dr. Hecht, who specializes in radiology and breast radiology, was nominated by fellow physicians and hospital personnel for the honor. The award is given to the physician who has shown an ongoing commitment to the hospital’s Planetree philosophy of patient-focused care and has been a role model to other staff members. It is inscribed, “Your exemplary skills as a physician, colleague and friend make us proud to work by your side.”

**Larry Bonchek, M.D. ’63**, retired in 1999 as founder and director of cardiothoracic surgery at Lancaster General Hospital in Lancaster, PA. Dr. Bonchek has been elected chair of the board of trustees of Franklin and Marshall College. He serves as editor-in-chief of the *Journal of Lancaster General Hospital* (www.jlgh.org) and as senior advisor for academic affairs at Lancaster General Health. He delivered the 2010 commencement address at the Lancaster General College of Nursing and Health Sciences.

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Robert S. Hoffman, M.D. ’69, practices psychiatry in the west San Fernando Valley and in Ventura, CA. He is the proud parent of five children and two stepchildren (a professor of education at University of Southern California; a clinical psychologist; a psychiatric social worker; an architect specializing in renewable design; a service writer for Jaguar; a student at UC Hastings Law School; and a worker in the solar energy industry) and proud grandfather of seven. He writes: “My wife, a champion swimmer, is my office manager and also designs jewelry. My 90-year-old mother lives close by. I play French horn with a semiprofessional wind ensemble and various orchestras.”

Peter Sartell Prentice, M.D. ’72, Capt., M.C., U.S. Navy (ret.), has retired to The Villages, in Florida, with Barbara, his wife of 31 years, after a career in the U.S. Navy followed by 10 years in emergency medicine. The couple has three children and six grandchildren (and added four step-grandchildren in June). Dr. Prentice says he is “done with medicine and now working on my Ph.D. in golf! More importantly, I am active in Christian ministry, helping to lead the local Discipleship Walk and helping to lead young teens in worship ministry.”

1970s

Diane Stover, M.D. ’70, continues to serve as head of general medicine and chief of pulmonary medicine at Memorial Sloan-Kettering Cancer Center. Dr. Stover has once again been chosen as one of New York’s top doctors. Her daughter, Dana, is at New York Medical College in Valhalla, NY, after receiving an M.P.H. degree with highest honors from Columbia University.

Jacob Ackerman, M.D. ’71, recently welcomed his 21st grandchild, Ezekiel, whose parents are Michael and Julie Sherry. (Daughter Julie is a Stern College alumna and a physical therapist.) Another grandson, Benjamin Kosowsky, son of Daniel and Karen Kosowsky, will be bar mitzvah in November. (Daughter Karen is a graduate of Yeshiva University High School and of the State University of New York School of Optometry.) Dr. Ackerman works for his son, Steven Ackerman, a Yeshiva University alumnus who is CEO of Brook Plaza Ambulatory Surgery Center in Brooklyn, NY. In May 2010, Dr. Ackerman was listed in the New York Times as one of fifteen “Top Ophthalmologists in the U.S.A.”

Joel Herskowitz, M.D. ’71, recently published a book with his wife, Roya Sayadi, Ph.D.: Swallow Safely: How Swallowing Problems Threaten the Elderly and Others—A Caregiver’s Guide to Recognition, Treatment, and Prevention. Dr. Herskowitz is on faculty in the division of pediatric neurology at Boston University Medical School. Dr. Sayadi is a speech-language pathologist with the Visiting Nurse Association in Natick, MA. For more information about their new book, please visit www.swallowsafely.com.

Mark Stein, M.D. ’71, FACS, is director of the division of cataract surgery at North Shore/LIJ Health System, associate clinical professor of ophthalmology at the New York University School of Medicine and associate clinical professor of ophthalmology at Hofstra School of Medicine in Hempstead, NY. Dr. Stein and Toby, his wife of 42 years, have four grandchildren.

Andrew Levitas, M.D. ’72, has written a novel to be published in January 2011 by Star Cloud Press, with review copies planned for September 2010. Dr. Levitas writes: “The book is not self-published and not a thriller…. Half of the action takes place during a night on call at the now-closed Morrisania Hospital in April 1973, with flashbacks to undergraduate years, and to medical training from 1968 to 1972 at a medical school in the Bronx named after a famous physicist.” The novel is titled Alumni Notes.

Roger A. Rahtz, M.D. ’73, will begin his second term as president of the New York Psychoanalytic Society and Institute, which will celebrate its 100th anniversary in 2011.

David Siegel, M.D. ’73, M.P.H., has been selected to serve on the Communications Committee of the Association of Professors of Medicine (APM). In this capacity, he helps select and edit submissions for “APM Perspectives” in the American Journal of Medicine (AJM). Dr. Siegel serves on the editorial boards of the AJM, Preventive Cardiology and Metabolic Syndrome and Related Disorders. In April, he served on the Comparative Effectiveness Special Emphasis Panel for the Agency for Healthcare Research and Quality, reviewing proposals submitted as part of the Health Care Reform Act of 2009. He is chief of medicine for VA Northern Health Care System and professor and vice chair of internal medicine at UC Davis School of Medicine.
Mitchell E. Geffner, M.D. ’75, is interim division chief and director of fellowship training in the division of endocrinology, diabetes and metabolism at Children’s Hospital Los Angeles (CHLA), and professor of pediatrics at the Keck School of Medicine of the University of Southern California. Dr. Geffner is a principal investigator in CHLA’s NIH-sponsored TODAY trial, studying treatments for young people with type 2 diabetes. He also serves as a national endocrinology consultant to the NIH-sponsored PHACS study of adolescents with HIV infection and of uninfected children who were exposed to antiretroviral therapy in utero. He is a board member of the Lawson Wilkins Pediatric Endocrine Society, a member of the American Board of Pediatrics Sub-Board on Pediatric Endocrinology, a medical advisor on childhood panhypopituitarism for the MAGIC Foundation and the Pituitary Network Association, and a member of the Scientific Advisory Board of the CARES Foundation. He serves as associate editor of Pediatric Endocrinology Reviews and was the coeditor of the recently published text Pediatric Practice: Endocrinology (McGraw-Hill).

William Clusin, M.D., Ph.D. ’76, is on the medicine faculty at Stanford University School of Medicine, where he is director of the EKG laboratory and studies ion channels and calcium. He has four children, including a son who plans to take physiology at college next year. Dr. Clusin was recently elected an overseas fellow of the Royal Society of Medicine in London and will be listed in Who’s Who in America in 2011.


Patrick Lamparello, M.D. ’76, is a vascular surgeon at the New York University Langone Medical Center and has his own clinical practice. He is currently vice chair of the department of surgery and director of the vascular surgery fellowship.

Frank Gillingham, M.D. ’77, is the medical director and a cofounder of HTH Worldwide, a leading international health insurance company based in Radnor, PA. Dr. Gillingham has authored a number of articles on healthcare abroad and has been a featured speaker at several international travel insurance conferences over the past ten years. He is a retired emergency room physician, having served as an attending physician at the UCLA Medical Center and as the ER medical director at Westlake Medical Center and Glendale Memorial Hospital in Southern California.

Lynne M. Mofenson, M.D. ’77, is branch chief for pediatric, adolescent and maternal AIDS at the Center for Research for Mothers and Children, Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) at the National Institutes of Health in Rockville, MD. Dr. Mofenson writes: “It is very gratifying to see many years of research on prevention of mother-to-child HIV transmission culminate in a change in World Health Organization policy guidelines that have the potential to significantly reduce new pediatric HIV infection globally. Based on research conducted by many individuals, including many funded by my branch at the NICHD, the WHO is now recommending use of antiretroviral prophylaxis of either the infant or the mother during breastfeeding to prevent postnatal transmission of HIV infection. My editorial on this topic was published in the New England Journal of Medicine in June. I am also extremely honored to have received the Lifetime Achievement Award for my work on pediatric and maternal HIV infection from Albert Einstein College of Medicine on June 3, 2010, along with my classmate Sten Vermund, M.D. ’77.”

Harold S. Koplewicz, M.D. ’78, executive director of the Nathan S. Kline Institute for Psychiatric Research,
For four decades, Charles Samuel Peskin, Ph.D., has studied the dynamics of the human heart—specifically, the relationship between the blood circulating through its four chambers and the heart’s muscles and valves. His promise was recognized early on: In 1983, he was awarded a MacArthur Fellowship, also known as a “genius award”—making his alma mater proud.

Dr. Peskin’s work involves a broad range of disciplines, including mathematics, physics and neuroscience. His discoveries, using sophisticated computer modeling, have the potential to benefit heart patients by helping physicians plan treatment strategies and by aiding in the design of better replacement valves.

Not bad for a guy who admits to not doing his math homework in high school. Dr. Peskin went on to study engineering and applied physics at Harvard and then entered Einstein’s combined M.D./Ph.D. program, where he did research in physiology. He didn’t complete the program’s M.D. component, “but I was pretty good at the Ph.D. portion,” he recalls.

Dr. Peskin is best known for developing an elegant mathematical model called the immersed boundary method, which simulates fluid flows in coupled systems, such as circulating blood interacting with the elastic boundary of the heart’s valve leaflets and muscle fibers. The computer simulation methodology he developed with colleague David McQueen, Ph.D., has made possible the application of computational fluid dynamics to cardiology. Although the immersed boundary method was developed primarily for cardiac research, scientists are also applying it to other coupled systems, including the dynamics of the human inner ear and the locomotion of microbes.

Dr. Peskin views Einstein’s M.D./Ph.D. program as “an amazing opportunity for me because I learned about so many interesting and important biomedical problems that became the focus of my life’s work.” Among his most influential mentors at Einstein was Edward Yellin, Ph.D., professor emeritus of physiology and biophysics and of cardiothoracic surgery, whose research has improved understanding of the relaxation and filling of the heart.

“He helped me set up experiments and was very encouraging,” says Dr. Peskin, who built a flow-visualization chamber in Dr. Yellin’s lab. “Edward Yellin is an inspiring teacher. He introduced both David McQueen and me to cardiac research, and he had an enormous influence on our subsequent work.”

After earning his Ph.D., Dr. Peskin remained at Einstein for postdoctoral experience in pediatric cardiology and pulmonary medicine. He then joined the faculty of the Courant Institute of Mathematical Sciences at New York University, where he remains today.

Marc Cohen, M.D. ’79, and Marjorie (Curtis) Cohen, M.D. ’79, live and work in Abington, PA, a suburb of Philadelphia. Marc is an invasive cardiologist and the administrator of his 19-person cardiology group. He finds a few hours a week to play golf and remains an avid Mets fan. Margie is in a neonatology practice in a large community hospital. The medical tradition carries on to the next generation; son Michael is entering his second year as a fellow in ENT at Boston Medical Center. Daughter Rachel lives and works in Washington, DC, concentrating on environmental public policy issues, and son Daniel is in the
OUR DNA | ALUMNI NEWS

Robert W. Marion, M.D. ’79, received the 2009 Zella Bronfman Butler Change Agent Award. Sponsored by the Butler Foundation and given by the UJA Federation of New York, the award honored Dr. Marion’s efforts to improve the lives of, and advocate for, people with disabilities. Dr. Marion is the Ruth L. Gottesman Chair in Developmental Pediatrics and the director of the Children’s Evaluation and Rehabilitation Center at Einstein. His seventh book, Genetic Rounds: A Doctor’s Encounters in the Field That Revolutionized Medicine, was published by Kaplan Publishing in October 2009 and will be available in paperback this fall.

Jerry Eng, M.D. ’81, Ph.D., is a senior partner in Brandywine Pediatrics in Wilmington, DE. Dr. Eng has practiced in Wilmington since finishing his pediatrics internship at Baylor in Houston, TX, and his residency in Wilmington. He and his wife, Robin Karol, Ph.D., have three children: Jennifer Eng-Kulawy, M.D. ’10, a resident at the U.S. Naval Hospital in San Diego, CA, specializing in pediatrics with the goal of a fellowship in pediatric rheumatology; Rabbi Brian Eng, who will enter law school this fall; and Greg Eng, who will complete his master’s degree in entertainment technology at Carnegie Mellon University next year. Robin recently retired as CEO of the Product Development and Management Association and is now a consultant in product development.

Irene A. Cohen, M.D. ’82, relocated in May to Austin, TX, after a lifetime in New York City. She is working as a psychiatrist in the Posttraumatic Stress Disorder Clinic at the Central Texas Veterans’ Health Care System in Temple, TX. Her husband, Michael Nill, Ph.D., retired in June from his position as headmaster of the Brooklyn Friends School in Brooklyn Heights, NY.

Kurt B. Nolte, M.D. ’82, is a professor of pathology and assistant vice president for research at the University of New Mexico School of Medicine. After 20 years as a faculty forensic pathologist, he began his first sabbatical year on July 1, 2010, and will work in the area of postmortem imaging technology. The sabbatical “will not interfere with my annual efforts to hunt elk with a bow and raise heirloom tomatoes.”

Hasan Bazari, M.D. ’83, stayed on in Boston after his internship in 1983 in internal medicine and his residency at Massachusetts General Hospital (MGH). He has been on faculty at MGH since completing a fellowship in nephrology there in 1989. Since 1994, Dr. Bazari has been program director for the internal medicine residency, training several Einstein alumni in internal medicine. He is also clinical director of nephrology. Dr. Bazari and his wife, Wendy (Levoy) Bazari, M.D., Ph.D. ’83, have two children: Anissa, an M.F.A. student in creative writing at New York University, and Adam, who will be graduating from Columbia College and will be a Fulbright fellow in Indonesia next year. Dr. Bazari writes: “I have very fond memories of my education at Einstein and owe a debt of gratitude to the institution and faculty for preparing me for my career.”

Jo Herzog, M.D. ’84, works in a practice in Birmingham, AL, where she does general, surgical and cosmetic dermatology as well as research. Her biggest accomplishment has been her family, which includes her husband, Bob, and their five children: Richard plays tennis in college and hopes to become a neurosurgeon; Ross is starting premed next...
year and dances with a ballet company; and Reid, 14, Rebecca, 12, and Ryan, 6, “are busy keeping me busy. Hope all is well with my classmates.”

**Pesach Lichtenberg, M.D. ’84**, works as a psychiatrist in Jerusalem. He will be spending the coming fall semester at Stanford University, where he will be a visiting professor.

**Daniel Hyman, M.D. ’86**, is the chief quality officer at the Children’s Hospital in Denver, CO. He has served there since 2008 and is responsible for leading the hospital’s quality-improvement and patient-safety initiatives. Dr. Hyman serves on a number of national child health quality leadership committees and was honored with the 2009 Faculty Achievement Award by the National Initiative for Children’s Healthcare Quality.

**Rory Hachamovitch, M.D. ’87, M.Sc.**, has joined the section of cardiovascular imaging, department of cardiovascular medicine, at the Cleveland Clinic in Cleveland, OH. Dr. Hachamovitch also received the Society of Nuclear Medicine Cardiovascular Council’s 2010 Hermann Blumgart Award for outstanding achievement in the field of nuclear cardiology and service to the council. He and his wife, Dr. Louise Thomson, have four-year-old twins, Rachel and Raphael.

**Ari Weitzner, M.D. ’88**, teaches ophthalmology residents as a physician specialist at Kings County Hospital Center in Brooklyn, NY, one of the largest teaching centers in the Northeast. Dr. Weitzner is the medical editor of the ophthalmology blog eyedocnews.com. He also started a company, Share Medical Space, LLC. ShareMedicalSpace.com is the only website dedicated to helping doctors find one another for the purpose of sharing medical office space—increasingly important because of challenging medical economics.

**Gerard D’Aversa, M.D. ’89**, is a partner in Ophthalmic Consultants of Long Island, a large ophthalmology practice based on Long Island, NY, that is involved in FDA studies to improve the treatment and diagnosis of ophthalmic diseases. In January 2011, Dr. D’Aversa will travel to Accra, Ghana, with Unite for Sight, a not-for-profit organization that provides high-quality eye care to people in impoverished nations. He will be joined by his daughter, Jaclyn D’Aversa, a sophomore at Barnard College. They will work with an eye clinic to screen for eye disease, implement educational programs and coordinate sight-restoring surgery for children and adults.

**Cindy (Listhaus) Dobrinsky, M.D. ’89**, and her husband, Aaron Dobrinsky, celebrated the marriage of their daughter, Elyssa Adina Dobrinsky, to Andy Feuerstein Rudin on March 14. Elyssa is a 2010 graduate of Yeshiva University’s Stern College; her mother is a 1985 Stern alumna, and her father is a 1985 alumnus of Yeshiva College. Elyssa is the granddaughter of Dr. Herbert C. Dobrinsky, YU’s vice president for university affairs, and her wife, Dina.

1990s

**Lawrence S. Rosenthal, M.D. ’90, Ph.D.**, is associate professor of medicine and director of the section of cardiac pacing and electrophysiology and of the EP Fellowship Program in the division of cardiovascular disease at the University of Massachusetts Memorial Medical Center in Worcester, MA. Dr. Rosenthal writes: “I wish I was able to come back for our reunion, but I was golfing in Ireland...Poor me.”

**Wendy Fried, M.D. ’91**, is in private practice in obstetrics and gynecology in North Hills, NY, delivering and operating out of North Shore University Hospital. She recently wrote a textbook, *Comprehensive Pocket Atlas of Hysteroscopy*, published in June 2010. Dr. Fried has four children: Joseph, 18, Shari, 16, Mia, 11, and David, 8.

**David Markenson, M.D. ’94, FAAP, FACEP**, is professor of pediatrics at the Maria Fareri Children’s Hospital at New York Medical College in Valhalla, NY, where he is also associate professor of public health and director of the Center for Disaster Medicine in the School of Health Sciences and Practice and Institute of Public Health. He was recently promoted to the post of vice president for disaster medicine and regional emergency services at Westchester Medical Center in Valhalla. He writes: “In this role I oversee our emergency management group, disaster medicine department and regional resource center, which oversee the preparedness activities of healthcare institutions in the lower Hudson Valley (3.2 million residents, 32 acute-care hospitals) as well as our regional emergency services.” Dr. Markenson was
also recently appointed to the Federal Emergency Management Agency National Advisory Council, which advises the administrator of FEMA on all aspects of emergency management.

**Todd Schiffer, M.D. ’94**, has a private practice in pediatrics with his father, Kenneth Schiffer, M.D. ’61, and his sister, Michelle Schiffer Merer, M.D. ’90, who is married to David Merer, M.D. ’90. Todd recently left his post as director of pediatrics at Lawrence Hospital in Bronxville, NY. He has been a pediatric hospitalist for the last 10 years and is about to embark on a master’s degree in medical management at Carnegie Mellon in Pittsburgh.

**Efrat Meier-Ginsberg, M.D. ’99**, is a member of an ob-gyn private practice in Bergenfield, NJ. She has four children ranging in age from 3 to 9.

**Soleak Sim, M.D. ’99**, is a general pediatrician with Erie Family Health Center in Chicago. Erie’s mission is to deliver culturally sensitive healthcare to the area’s underserved population.

**2000s**

**Eric Tatar, M.D. ’00**, has been a gastroenterologist in Rockland County, NY, for the past four years. Dr. Tatar and his wife, Stacey, have two children, Sophie and Joshua.

**Alon Gitig, M.D. ’01**, is a practicing noninvasive cardiologist with Riverside Medical Group in Yonkers, NY. He is on the faculty of Saint John’s Riverside Hospital in Yonkers, and also holds an appointment at Mount Sinai Medical Center. He lives in New Rochelle with Lori, his wife of five years, and their three-year-old son, Noah.

**Deborah Mensch, M.D. ’01**, and **Robert Marchlewski, M.D. ’01**, celebrated the first birthday of their second daughter, Ava Grace, on July 20.

**AnnMarie (Huysman) Liapakis, M.D. ’05**, and her husband, Michael, welcomed a son, Peter Nicholas, on November 12, 2009. AnnMarie is a gastroenterology fellow at New York Hospital/Weill Cornell Medical Center.

**Anita Mohan Saha, M.D. ’05**, and her husband, Shamit Saha, welcomed a baby boy, Raj Mohan Saha, on July 5. In September, Dr. Saha and her family moved to Philadelphia, where she recently started a new position as a staff gynecologist at Jeanes Hospital, a community hospital affiliated with the Temple University Health System. She previously worked as a private practice ob-gyn at Northern Obstetrics & Gynecology on Long Island, with fellow Einstein alumni **Wendy Fried, M.D. ’91**, and **Brian Cooperman, M.D. ’88**.

**Tejash Shah, M.D. ’05**, is a project manager in the New York office of McKinsey & Company, a management consulting firm. He advises large pharmaceutical clients, insurers, hospital chains and the government on matters of strategy and risk.

**Jeremy White, M.D. ’05**, finished his otolaryngology–head and neck surgery residency at the George Washington University in June. He is currently doing a two-year plastic and reconstructive surgery residency at the Cleveland Clinic in Weston, FL. He and his wife, Rachel, have two children: Matthew, age 3 1/2, and Eitan, age 1 1/2.

**Matt Dombrow, M.D. ’06**, completed his tenure as chief resident of ophthalmology at the University of Medicine and Dentistry of New Jersey and started a vitreo-retinal fellowship at Yale–New Haven Hospital in July. He and his wife, Melissa, celebrated the first birthday of their daughter, Leah Paige, on May 11.

**Shahrooz Eshaghian, M.D. ’06**, recently completed his first year of a hematology/oncology fellowship at UCLA Medical Center in Los Angeles, CA. Dr. Eshaghian and his wife, Yael, welcomed their first child, “a beautiful baby girl, Navah,” on February 11.
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“T’ll honor to be an Alumni Scholar and a member of the Einstein family. This scholarship is enabling me to pursue my dream: a medical career involving my passion for molecular genetics.”

Jason Matos, Alumni Scholar
Class of 2012

For more information, please contact the Office of Alumni Relations at 718.430.2013 or alumni@einstein.yu.edu.
The Einstein Women’s Division: A Thriving Tradition of Philanthropy

In 1953—two years before the College of Medicine first opened its doors—a group of pioneering women founded the National Women’s Division of Albert Einstein College of Medicine. They had a shared passion: helping create a new medical school that would welcome gifted students of all backgrounds without the strict quotas that prevailed at the time. Today, the Women’s Division boasts more than 1,000 members in two chapters: one in New York City, the other encompassing suburban Westchester County, New York, and Fairfield County, Connecticut.

Over the years, the Women’s Division has been a driving force in philanthropy at Einstein, raising more than $100 million in support of research and educational programs at the College of Medicine. The Spirit of Achievement Luncheon, the division’s flagship fundraiser, was conceived in 1954 as part of the campaign to launch Einstein, and has remained a proud Einstein tradition. Held every spring in New York City, the Spirit Luncheon honors outstanding individuals in the arts, business, journalism and other fields. The dazzling list of past honorees includes Margaret Mead, Eleanor Roosevelt and Meryl Streep.

The Women’s Division also sponsors Hamptons Family Day, a fun-filled “Wild, Wild West Carnival” that typically draws 1,500 parents and children who summer in the Hamptons.

ON THE WEB
To read more about the Women’s Division, visit www.einstein.yu.edu/home/donors/WomensDivision.asp.

Spirit Luncheon Shines Spotlight on Women’s Cancer Research

A cosmetics pioneer, a TV journalist and a leading Einstein researcher were among the honorees at the 56th Annual Spirit of Achievement Luncheon held on April 27 at the Pierre Hotel in New York City. Hosted by the New York chapter of Einstein’s National Women’s Division, the luncheon, which drew a crowd of 450 Women’s Division members and guests, benefited research at the Albert Einstein Cancer Center, with a particular focus on women’s cancers.

Generously donating his time and talent for the second year in a row, Willie Geist, cohost of MSNBC’s Morning Joe, served as master of ceremonies. On the dais were fashion designer Naeem Khan (whose clients include First Lady Michelle Obama); luxury fur designer Dennis Basso; Lincoln Center’s director of fashion, Stephanie Winston Wolkoff; skin-care entrepreneur Adrien Arpel; TV journalist and NBC Today Show cohost Hoda Kotb; and Sylvia Wassertheil-Smoller, Ph.D., professor of epidemiology & population health and holder of the Dorothy and William Manealoff Foundation & Molly Rosen Chair in Social Medicine.
To join the Einstein National Women’s Division’s initiative to support research on women’s health and cancers, or to learn more about the Women’s Division, please contact Janis Brooks at 718.430.2818 or janis.brooks@einstein.yu.edu.

Tara Stein was inducted as the new president of the Westchester/Fairfield chapter of Einstein’s National Women’s Division at an installation ceremony held on June 17, 2010, at Fenway Golf Club in Scarsdale, NY.

Ms. Stein also serves as an assistant vice president of the division’s New York chapter and as a committee member for 2010 Family Day in the Hamptons.

2010 Spirit Luncheon Cochairs, from left: Renée Steinberg, Ashley Stark, Andrea Stark, Aileen Murstein, Amie Murstein Hadden, Nicki Harris, Jackie Harris Hochberg.

been an outsider and a refugee until I came to Einstein...where I found a really true home.” The highlight of her professional career, she said, was becoming head of the Women’s Health Initiative at Einstein, a major study of the health problems of older women.

Luncheon chairs were Nicki Harris, Jackie Harris Hochberg, Aileen Murstein, Amie Murstein Hadden, Andrea Stark, Ashley Stark, Renée Steinberg, Sarah Steinberg Fiszel and Jill Steinberg.

“This most people have been touched in some way by some form of cancer that specifically affects women,” said Jackie Harris Hochberg, president of the New York chapter. “With our great turn-out today, I’m confident our current initiative will help Einstein’s dedicated researchers succeed in their efforts to ensure a healthier future for all women and girls.”

Women’s Division Installs Westchester/Fairfield Chapter President

Tara Stein was inducted as the new president of the Westchester/Fairfield chapter of Einstein’s National Women’s Division at an installation ceremony held on June 17, 2010, at Fenway Golf Club in Scarsdale, NY.

Ms. Stein also serves as an assistant vice president of the division’s New York chapter and as a committee member for 2010 Family Day in the Hamptons.

In their acceptance remarks, two of the honorees mentioned their personal experiences with breast cancer. Ms. Arpel told of helping her sister fight the disease, while Ms. Kotb, a breast cancer survivor, announced, “I just got checked for my third year, and I’m all clear.” Introduced by surprise guest and Today colleague Al Roker, Ms. Kotb noted that enduring the diagnosis and a mastectomy had taught her that “life has margins, and it’s to be valued and not wasted.”

Dr. Wassertheil-Smoller, who is a Holocaust survivor, spoke of the support and encouragement she has received at Einstein over the years. “I had always
Men’s Division Golf Outing Honors Martin Luskin and Supports Medical Research

Overcast skies could not dampen the fun and camaraderie at the 2010 Einstein Men's Division’s Golf & Tennis Tournament and Dinner, held June 14 at Quaker Ridge Golf Club in Scarsdale, NY. This year’s honoree was Martin Luskin, recipient of the 2010 Albert Einstein Humanitarian Award.

Mr. Luskin, a partner in the law firm of Blank Rome LLP, is a longtime leading member of the Men’s Division and a passionate advocate for medical research at Einstein. “How many of us can truly say we’re working every day to change the world?” he asked upon receiving his award. “Take a tour of the Price Center/Block Research Pavilion at Einstein and meet the physician-scientists there, as I have, and you will be in the presence of brilliant people who are doing just that. As a member of the Men’s Division, I am honored to play even a very small part in that endeavor.”

Proceeds from the event benefited the Men's Division Research Scholars Program (MDRSP), the division's $3 million fundraising initiative. Now in its second year, the MDRSP helps fund the training of Einstein physician-scientists. These talented researchers collaborate with basic scientists at Einstein on studies aimed at speeding laboratory findings into new treatments and prevention strategies for cancer, diabetes and other serious illnesses.

During the dinner program, Associate Dean Harry Shamoon, M.D., director of the Institute for Clinical and Translational Research, introduced the 2010 Men's Division Research Scholars. They’re involved in a variety of research areas, including childhood asthma and childhood obesity, both of which are on the rise in the United States, with a high prevalence in the Bronx.

The five new Men's Division Research Scholars are: Irene Blanco, M.D., M.S., who is interested in the biomarkers for kidney damage caused by lupus; Sean Lucan, M.D., M.P.H., M.S., who works on reducing childhood obesity in the Bronx through community-based nutrition programs; Deepa Rastogi, M.D., M.S., a pediatric pulmonologist studying the connection between childhood obesity and asthma; Sara Rubin, M.D., M.P.H., who is exploring the use of long-acting, reversible contraceptives to prevent teen pregnancy; and Joshua Steinerman, M.D., who is investigating ways to promote healthy brain aging to prevent Alzheimer's disease.
To learn more about the Einstein Men’s Division or the Men’s Division Research Scholars Program, please contact Patricia Margulies at 718.430.4170 or patricia.margulies@einstein.yu.edu.

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The division carries out its commitment to Einstein by hosting a variety of fund-raising events and educational programs throughout the year. Two flagship events are held each year: Bronx Night, spotlighting Einstein’s close relationship with the Bronx community, and the Men’s Division Annual Golf & Tennis Tournament and Dinner.

Event chairs were Jack Somer, Mitchel Maidman, Neil Clark, Marc Altheim and Peter Zinman.

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Einstein’s Philanthropic Band of Brothers

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Einstein Overseer Linda Altman and her husband, Earle Altman, have pledged $1,250,000 to support the work of Steven Libutti, M.D., an internationally recognized leader in cancer research and oncological surgery. The Altmans’ remarkable gift will greatly enhance Dr. Libutti’s efforts to develop innovative cancer therapies that could potentially transform cancer care.

Dr. Libutti came to Einstein in 2009 from the National Cancer Institute (NCI). His research focuses on the formation of new blood vessels that nourish tumors, as well as the interactions among tumor cells and other cells and components of the tumor microenvironment that influence tumor growth and spread. While at the NCI, Dr. Libutti and his collaborators developed an innovative method for delivering therapeutic genes to the blood vessels of tumors in mice.

Dr. Libutti now serves as professor and vice chair of surgery at Einstein and at Montefiore Medical Center; associate director for clinical services at the Albert Einstein Cancer Center; director of the Montefiore-Einstein Center for Cancer Care; and professor of genetics at Einstein. His multifaceted role will allow him to promote the growth of multidisciplinary translational research collaborations between Einstein and Montefiore.

Longtime Benefactors and leading Einstein supporters, Linda and Earle Altman previously established the Linda and Earle Altman Faculty Scholar in Cancer Research. Gary L. Goldberg, M.B., Ch.B. was invested as the inaugural holder in 2009. Mrs. Altman has served on Einstein’s Board of Overseers since 2006 and is a member of its executive committee; she is a past president of the Einstein National Women’s Division.
On April 1, 2010, Allen M. Spiegel, Einstein’s Marilyn and Stanley M. Katz Dean, hosted a dedication ceremony and luncheon for Robert M. Beren and members of his family at Einstein’s new Ruth L. Gottesman Clinical Skills Center.

Mr. Beren, along with his children, Nancy T. Beren, Amy Beren Bressman, Julie Beren Platt and Adam E. Beren, made a generous pledge of $360,000 to support the Clinical Skills Center. In recognition of their support, the center’s conference room has been named for Harry H. Beren, Mr. Beren’s late uncle.

At the dedication and luncheon, Mr. Beren, his wife, Malka, his daughter Julie and three of her children were joined by Einstein’s chairperson (and friend of the Berens), Dr. Ruth Gottesman, along with a host of Einstein administrators and students.

“We’re deeply grateful for the Beren family’s generous and steadfast support of the College of Medicine,” said Dean Spiegel. “This latest commitment has enhanced our capacity to continue providing the highest quality clinical training for our students. We’re pleased that the opportunity to support the Gottesman Clinical Skills Center has provided you with a chance to honor the memory of your beloved uncle.”

The Beren family’s previous gifts to Einstein include $1 million to endow the Harry H. Beren Study Center in the D. Samuel Gottesman Library and $500,000 to benefit the study center. In addition to his support for Einstein, Mr. Beren is chairman emeritus and a longtime Benefactor of Yeshiva University.
Much has changed since this photo of the Einstein library was taken in 1959. Today’s hairstyles are longer; that low shelving extending from the left is much taller, nearly touching the ceiling; and laptops abound. But certain features endure when it comes to libraries, and these Einstein students of 51 years ago share a few traits with their studious modern counterparts: immersed in books, taking notes and hoping to ace that upcoming exam. (See page 4, “A New Page in the Gottesman Library’s History.”)
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Congratulations!
From left, Ronald Ross, M.D. ’60, Robert Bernstein, M.D. ’60, and new grads Dara Bier, M.D. and Baruch Berzon, M.D.
See pages 48–53 for 2010 Reunion and Commencement coverage.