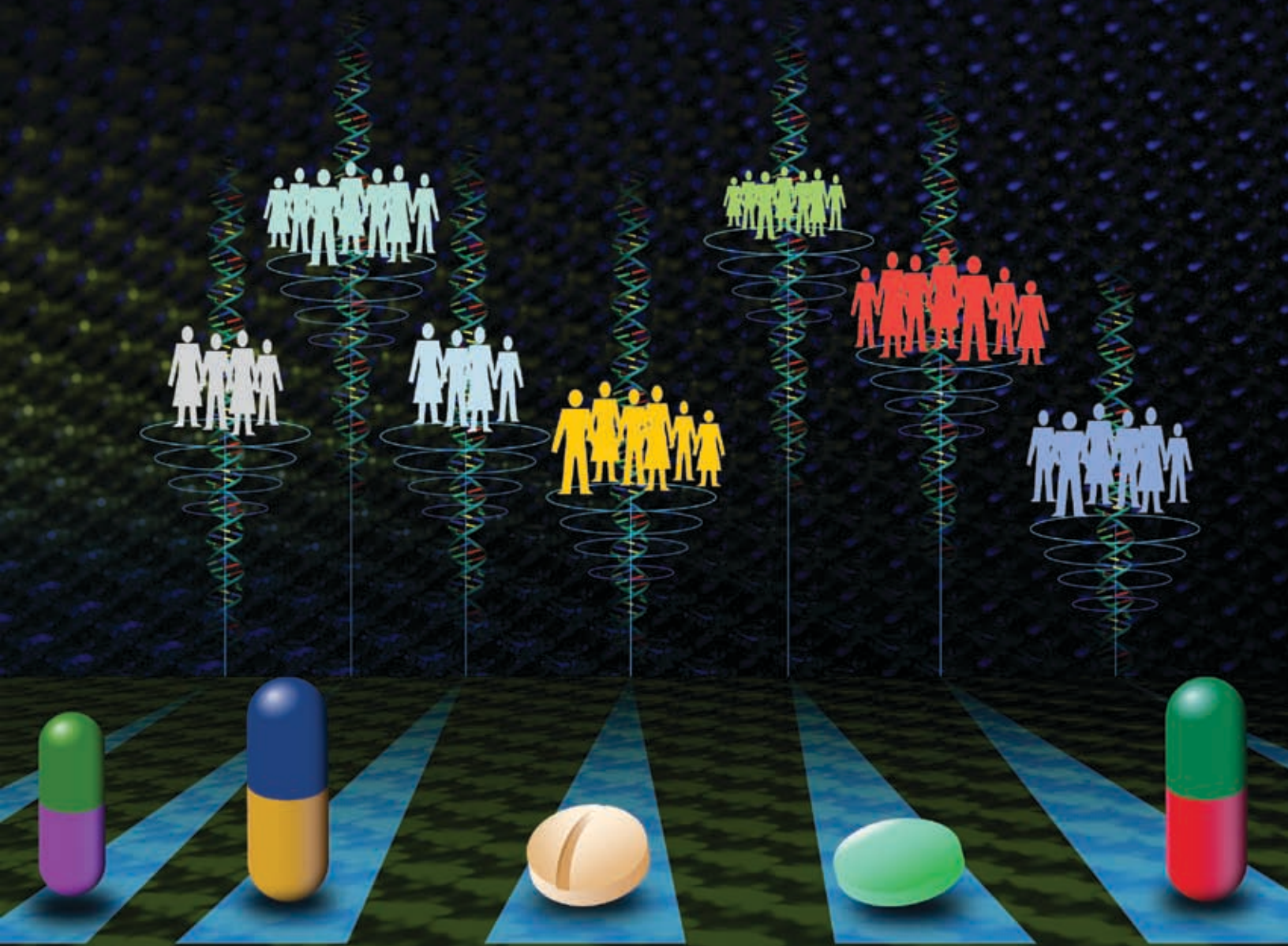


PENN Medicine

SPRING 2008



THE ERA OF PERSONALIZED MEDICINE?

Considering the Capital Campaign
Dr. Hendrie Goes to Cambodia
The “Dark Energy” of Proteins
To China for an Acupuncture Elective

Watching the Stars

Over the years as an editor and writer for the School of Medicine and the Health System, I've attended several induction ceremonies for Alpha Omega Alpha, the Honor Medical Society. Each time, the students who are inducted are different, but my response is the same: Wow! While Gail Morrison, M.D. '71, G.M.E. '77, the vice dean for education, announces each student's name and briefly describes their achievements, my emotions are decidedly mixed. Part of me marvels at these young people who have accomplished so much and who have such promising careers ahead. But another part of me wants to sink lower in my seat and berate myself as a lazy underachiever. Fortunately, the latter feeling doesn't last nearly as long.

As Arthur H. Rubenstein, M.B.,B.Ch., executive vice president of the University of Pennsylvania for the Health System and dean of the School of Medicine, noted at this year's ceremony, the students who are selected for AOA have stellar academic records and have demonstrated leadership, professionalism, a sense of ethics, and a commitment to service. AOA was founded in 1902, during a dark period for medicine, "an era of quackery and charlatanism," said Rubenstein. One goal of the budding Alpha Omega Alpha was to introduce greater scientific rigor into the curriculum. But the society also called for physicians to cultivate social-mindedness and professionalism. More than a century later, said Rubenstein, those values "remain valid."

This year, the guest speaker was David A. Asch, M.D., M.B.A., the Robert D. Eilers Professor of Health-Care Management and Economics in both the School of Medicine and the Wharton School. Asch also serves as executive director of the University's Leonard Davis Institute of Health Economics.

Asch's combination of interests made him an attractive choice. After all, as Dean Rubenstein put it, "There's almost nothing more important" for the nation than health care that is delivered well. The topic is all the more pressing in a presidential election year.

Then it was time for Morrison to introduce each of the students. There were 23 inductees – 11 men and 12 women. They came to the School of Medicine from 16 different colleges; 12 of them did not enter medical school directly after college. While they distinguished themselves in various ways, said Morrison, most were involved in caring for the underserved. Many have spent time in foreign countries while also serving communities in and around Philadelphia. In fact, Andre Michel Ibawi, who has led fundraising efforts for the Guatemala Health Initiative and conducted research in Cameroon, missed the ceremony because he was in Botswana, where PENN Medicine has a program. Along the way, Ibawi also demonstrated his academic prowess and was honored with the Michael Harty Award of Excellence in Gross Anatomy, in recognition of his commitment to learning and teaching.

Ilana Sherer worked with homeless people at Covenant House while enrolled in the School of Medicine. She has also helped develop a clinical elective in Guatemala; spent a summer in Botswana, helping to create culturally appropriate care for AIDS patients; and, last November, spent a month in Tanzania working with AIDS patients at a rural hospital. To relax – as if there were any free hours left! – Sherer manages a career as a klezmer musician (playing the fiddle),

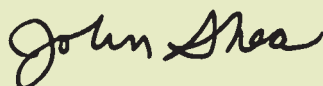
writes poetry and prose, attends music camps, and chaperones fifth-graders on Sierra Club camping trips.

Laurie Beth Gray served as treasurer and board member of the United Community Clinics, a student-run organization that provides free care to low-income residents of West Philadelphia; organized a lemonade stand to benefit Alex's Lemonade Stand, a charity for children's cancer research; and engaged in research exploring the effects of asthma in teenagers. She also served as co-chair for the Women's Medical Student Association. Gray, too, is a violinist, a member of the University Chamber Music Society.

Kiona Yasmin Allen was coordinator of the Pre-Health Mentor Program, which organizes activities and serves as a resource for hundreds of minority undergraduates. She co-founded the Guatemala Health Initiative, which helped open a much-needed hospital in Santiago. She expects to have an essay in a forthcoming textbook on medical ethics – and even with the other demands on her time, she was able to take part in several competitions with the Penn Club Gymnastics Team.

Andrew Bond has been a community health intern with Bridging the Gaps, working with other health-sciences students to develop and implement a health education curriculum for a local mental-health treatment center. During his pre-clinical training, he coordinated a group that trained medical students to provide HIV/AIDS education to local middle-school students.

These snapshots, I hope, give a sense of these 23 exceptional students. "It is very difficult to be in the top quarter of this class," said Morrison with justifiable pride. And yet the AOA inductees managed despite all their other activities. How they do it will remain a mystery for many of us. ♥





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MAKING IT PERSONAL *By Rabiya Tuma, Ph.D., with John R. Shea, Ph.D.*
 Government agencies are supporting it; some private groups see its enormous potential for making money; many physicians are enthusiastic about its clinical impact. Although some questions remain, the movement toward personalized medicine is very strong, and many of Penn's cancer specialists are taking the lead.

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WHERE WE ARE, WHERE WE'RE HEADED *By Nicole A. Gaddis*
 Now that the University of Pennsylvania has launched a major fund-raising campaign, PENN Medicine seeks to raise \$1 billion of the total. Two faculty members, a medical student, and a former patient who calls Penn "my second home" discuss what they hope the campaign will accomplish.

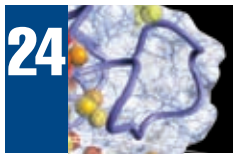
THE PRINCIPLE OF SHARING *By Elizabeth Eidlitz*
 It was a different era when Nancy Woodward Hendrie, M.D. '58, went to the School of Medicine – one of only eight women. She had to scramble and persist to get a residency and then a job. Now she puts the same kind of determination into supporting an orphanage in Cambodia.

MEASURING THE UNSEEABLE *By Karen Kreeger*
 Penn researchers are the first to observe and measure the motion *inside* proteins – their 'dark energy.' The discovery reveals how this internal motion affects the function of proteins and suggests why "rational" drug design has been so difficult.

SNOOZING WORMS *By Karen Kreeger*
C. elegans has been a help to scientists for many years. Now, the simple roundworm has helped a team of Penn researchers explain the evolution of sleep.

LEARNING ACUPUNCTURE FROM THE EXPERTS *By Sally Sapega*
 Following his own "transformational" experience as a medical student in China, Jun J. Mao, M.D., now a faculty member at Penn, created an elective that brings other medical students to China. There they learn about acupuncture and other traditional medicine.

A RESOURCE FOR POSTDOCS *By Thomas W. Durso*
 Now 10 years old, Biomedical Postdoctoral Programs is an international model for how to train – and treat – postdoctoral researchers. And, as the office's director says, postdoc trainees "are the backbone of the modern research laboratory."



An Invitation to Help Make History

In October, the University of Pennsylvania formally announced “Making History: The Campaign for Penn,” a five-year, \$3.5 billion fund-raising campaign. At the time of the announcement, Penn had already raised \$1.6 billion toward the goal; in February, the total had reached \$1.8 billion. Among all the University’s schools and programs, PENN Medicine had the highest goal: \$1 billion. Overall, the campaign will support the University’s highest priorities, expanding support for students, faculty, and the facilities. Prominently mentioned among the latter priorities is the Ruth and Raymond Perelman Center for Advanced Medicine.

“This monumental campaign is designed to make Penn an even greater university and an even more extraordinary force for good, here at home and around the world,” said President Amy Gutmann, Ph.D. “We will become a new kind of university – more intellectually daring, more culturally and physically vibrant, and more socially transformative than ever before imagined.”

For more on PENN Medicine’s role in “Making History,” see “Where We Are, Where We’re Headed” (pp. 16-19) and Development Matters (pp. 32-35).

A Successful Visit

At the end of January, the School of Medicine was visited by six external reviewers from the Liaison Committee on Medical Education (LCME). They examined all aspects of the school, from organization to curriculum to facilities and finances. Nationally recognized as the accrediting authority for medical education programs that lead to the M.D. degree in U.S. and Canadian medical schools, the LCME is sponsored by the Association

A Notable Arrival

The 220-ton particle accelerator that will generate the proton beams for the Roberts Proton Therapy Center arrived on the Penn campus in grand style in late January. The longer part of its journey was from Belgium to the Port Authority of Philadelphia. For the shorter leg, the accelerator required a specially constructed, 19-axle trailer truck and a police escort to the Center’s site on Convention Avenue, behind Penn Tower. In typical Philly style, a group of mums was there to help greet it.

There were, in fact, two deliveries over two days, each bearing 110 tons worth of the most advanced proton therapy technology available. Together, the halves weigh about the same as a 747 airliner.



When the Center is constructed, it will be the largest of its kind in the world – and the only cancer treatment center that will fully integrate conventional radiology treatment and proton beam therapy. The Center is scheduled to open next year.

Upgraded Ratings

Two leading bond-rating agencies have upgraded their ratings for the University of Pennsylvania Health System. Standard & Poor’s upgraded UPHS from A+ to AA-. Moody’s Investor Service raised the rating to AA3. In particular, Standard & Poor’s cited the Health System’s prominent clinical reputation and position in the market, which contribute

to growth in “an extremely competitive environment.”

Ralph Muller, CEO of the Health System, noted that such financial upgrades are important because they “publicly recognize that UPHS delivers outstanding care, in a fiscally disciplined manner, enhancing our ability to be strong for years to come.”

of American Medical Colleges and the American Medical Association.

Given the high stakes of the review, Gail Morrison, M.D. ’71, G.M.E. ’77, vice dean for education, and Arthur H. Rubenstein, M.B.,B.Ch., executive vice president of the University of Pennsylvania for the

Health System and dean of the School of Medicine, were pleased to announce that the site visit had gone very well. As they put it, preparation for the important re-accreditation review had gone on for the last 18 months. The culmination was the on-site review, during which the LCME

reviewers met with more than 100 faculty members and students to hear their personal evaluations of the strengths and challenges in our School.

A final report will be issued over the next several weeks, but in the meantime, according to Morrison and Rubenstein, “The reviewers commented that they were extremely impressed with the collaborative culture that exists across our Health System and School as well as the University, enabling us to meet our strategic goals. Our curriculum was rated as innovative, integrated, flexible, and data-driven, with many outcome measures that allow changes to be made in real time. The student body was described as ‘impressive and vibrant’ and thriving in an atmosphere that allows students to take advantage of multiple opportunities across education, research, and clinical experiences.” The integrated management and resource planning of the Health System and the School of Medicine under PENN Medicine was also cited as “an enormous and enviable strength.”

A New Scientific Director

M. Celeste Simon, Ph.D., professor of cell and developmental biology, was appointed scientific director of the Abramson Family Cancer Research Institute. She has been an investigator for



Simon

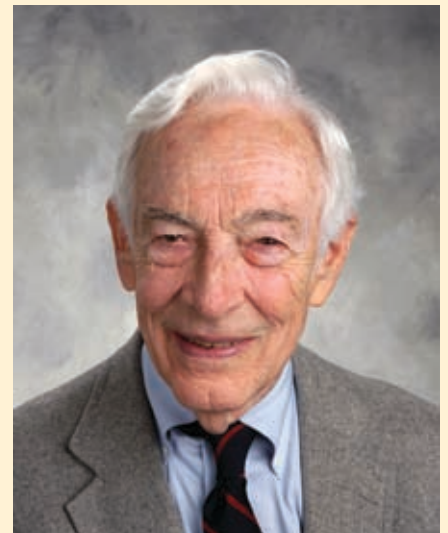
the institute and an investigator for the Howard Hughes Medical Institute since her arrival in 1999 from the University of Chicago. Simon’s chief research interests include investigating cellular responses to changes in oxygen availability using mouse models of development and tumor progression. She succeeds Craig Thompson, M.D, who was named director of the Abramson Cancer Center in September 2006.

Simon earned her Ph.D. degree in molecular biology from the Rockefeller University in 1985. She then became a Howard Hughes Associate at Boston Children’s Hospital, Harvard Medical School. Simon joined the faculty of the University of Chicago Medical School in 1992 and was appointed a Howard Hughes Medical Institute Investigator as an assistant professor the following year. At Penn, she was promoted to the rank of professor in 2004. Her honors include the Cancer Foundation Young Investigator Award in 1993 and the Elliot Osserman Award from the Israel Cancer Research Fund in 1999. She has published more than 150 papers in high-profile journals, including *Cell*, *Science*, *Nature*, and *Nature Genetics*.

New Program Named for a Familiar Face

Albert J. Stunkard, M.D., emeritus professor of psychiatry, former chair of Penn’s Department of Psychiatry, and a scholar internationally renowned for his obesity research, began his career at the School of Medicine in 1957. In October, the Department of Psychiatry and the Center for Weight and Eating Disorders honored him for his 50 years at Penn by naming a new program after him: the Albert J. Stunkard Weight Management Program.

The program offers comprehensive, medically supported treatments to patients, both as individuals and in groups.



Stunkard

The multidisciplinary treatment team provides patients with one-on-one consultations with nutritionists, exercise specialists, mental-health professionals, and other medical specialists. The program serves the general public rather than only participants in research studies. It also collaborates with the Center for Weight and Eating Disorders, which was founded by Stunkard, to better understand the causes of weight and weight-related disorders.

The current director of the Center for Weight and Eating Disorders, Thomas A. Wadden, Ph.D., professor of psychology in psychiatry, is the executive director of the new program. David Sarwer, Ph.D., associate professor of psychology in psychiatry, is director of the program. Andrea Diamond, a registered dietician, is the program coordinator. For more information, visit www.med.upenn.edu/weightloss.

Stunkard, known as Mickey, was the first to describe the powerful environmental influence on obesity of social class and, through the study of identical twins separated at birth, of the even greater power of genetics. He has developed a widely used questionnaire to assess the psychological aspects of eating behavior. An early president of the Society for Behavioral Medicine, he has received many honors, including election to the Institute of Medicine of the National Academy of Sciences.

Honors & Awards



Brennan

Patrick J. Brennan, M.D., the professor of medicine who serves as chief medical officer and senior vice president of the University of Pennsylvania Health System, received the Alumni Achievement Award of Temple University School of Medicine in October. A 1982 graduate, Brennan was also a chief resident at Temple’s hospital. He was recognized for his expertise in infection control and patient safety as well as his contributions to policy and procedure at institutional, regional, and federal levels. He chairs both the Sentinel Event Advisory Group of the Joint Commission and the federal Healthcare Infection Control Practices Advisory Committee. He is one of 14 infectious diseases experts in the nation who advise the U.S. Department of Health and Human Services and the Centers for Disease Control and Prevention. Brennan is president-elect of the Society of Healthcare Epidemiology of America.

R. Nick Bryan, M.D., Ph.D., the Eugene P. Pendergrass Professor and Chair of the Department of Radiology, received the Gold Medal from the Radiological Society of North America in November. According to the society, Bryan is “a steady, creative individual who has made impressive contributions to radiology on many fronts.” Bryan, who became

president of the society in 2002, has also served as president of the American Society of Neuroradiology and the American Society of Head & Neck Radiology.

Jo Buyske, M.D., chief of surgery at Penn Presbyterian Medical Center since July 1999, has stepped down to become associate executive director of the American Board of Surgery. During that time, she also served as director of minimally invasive surgery and as director of the PPMC operating room. A Fellow of the American College of Surgeons, she has been a director of the American Board of Surgery and an officer of the Society of American Gastrointestinal Endoscopic Surgeons.

William F. DeGrado, Ph.D., the George W. Raiziss Professor of Biochemistry and Biophysics, received the Ralph F. Hirschmann Award in Peptide Chemistry, presented by the American Chemical Society. The award recognizes and encourages outstanding achievements in the chemistry, biochemistry, and biophysics of peptides. DeGrado is an adjunct professor of chemistry in the School of Arts and Sciences.

David Dinges, Ph.D., professor of psychology in psychiatry, was awarded the Distinguished Public Service Medal by NASA “for outstanding contributions to improving the health, safety, and performance of human space flight in the behavioral health and performance area.” NASA describes the medal as “the highest honor NASA awards to a non-government individual, . . . granted only to someone whose distinguished accomplishments contributed substantially to the NASA mission. . . .”

Dinges directs the Unit for Experimental Psychiatry and is chief of the Division of Sleep and Chronobiology in the Department of Psychiatry. An expert in the biological limits of human performance

relative to sleep and circadian biology, Dinges currently serves as team leader for the Neurobehavioral and Psychosocial Factors area of the National Space Biomedical Research Institute, which seeks to find countermeasures to health-related problems and challenges that men and women will face on long-lasting missions in space. He is currently directing an experiment supported by NASA on astronauts living in the Aquarius facility on the ocean floor off Florida.

Dwight L. Evans, M.D., and **Lee A. Fleisher, M.D.**, have each received the 2007 John C. Oakley, M.D., Pioneers in Pain Medicine Award from the National Pain Foundation. Evans, the Ruth Meltzer Professor and Chairman of the Department of Psychiatry, is also professor of medicine and neuroscience. Fleisher is the Robert Dunning Dripps Professor and Chair of the Department of Anesthesiology and Critical Care. According to the Foundation, Evans and Fleisher have demonstrated inspired leadership and extraordinary vision to combine the resources of several departments to create the Center for Pain Management – a new model for providing a higher level of care for patients with chronic pain disorders, for training clinicians in pain medicine, and for advancing cutting-edge scholarship in pain research.

Steven Galetta, M.D., G.M.E. ’87, the Ruth Wagner Van Meter and J. Ray Van Meter Professor of Neurology, and **Richard Lackman, M.D. ’77, G.M.E. ’82**, the Paul B. Magnuson Professor of Bone & Joint Surgery and Chair of the Department of Orthopaedic Surgery, are two of 10 national recipients of the 2008 Parker J. Palmer Courage to Teach Award. The award, presented by the Accreditation Council for Graduate Medical Education, recognizes distinguished program directors for their commitment to

teaching and development of innovative and effective residency programs.

Paul N. Lanken, M.D., professor of medicine and of medical ethics, was one of five 2007 National Honorees named by the Gold Humanism Honor Society. According to the Society, the honorees “are distinguished by their unique and influential roles that collectively combine national thought leaders, scholars, and major contributors to advancing the values of humanism and professionalism in medicine.” The first associate dean for professionalism and humanism in any U.S. or Canadian medical school, Lanken is also a senior fellow at Penn’s Center for Bioethics and a specialist in pulmonology and critical-care medicine. As associate dean, he oversees all coursework related to professionalism and humanism that spans and integrates medical education during medical school.

Virginia M.-Y. Lee, Ph.D., M.B.A. ’84, the John H. Ware 3rd Professor in Alzheimer’s Research in the Department of Pathology and Laboratory Medicine, was a recipient of the 2008 Franklin Founder Award, presented each year since 1998 by Celebration! Benjamin Franklin, Founder. Lee, who is director of Penn’s Center for Neurodegenerative Disease Research, was honored for her contributions to finding the underlying causes of and developing novel treatments for Alzheimer’s disease, Parkinson’s disease, and other neurodegenerative disorders. The event took place on January 17, Franklin’s birthday.

Samir Mehta, M.D., G.M.E. ’06, assistant professor of orthopaedic surgery at HUP and chief of the Orthopaedic Trauma Service, received the John Border Memorial European Trauma Fellowship, presented by AO North America. He took the

fellowship this fall at a 1,200-bed trauma hospital in the Saar region in Germany. Before that, he was one of the recipients of the 2007 North American Traveling Fellowship, awarded by the American Orthopaedic Association to introduce young orthopaedic surgeons to leaders in the field. Fellows visited 17 academic medical centers along the East Coast in 35 days.

Daniel Polsky, Ph.D., associate professor of medicine and of health-care systems in the School of Medicine and the Wharton School, is serving a one-year term in Washington, D.C., as one of eight senior staff economists advising President Bush’s Council of Economic Advisors. His specific role is to furnish studies and recommendations pertaining to matters of federal health policy and legislation as the president may request. Polsky received a Ph.D. degree in economics from Penn in 1996.

At the end of each year, *Science* publishes its Breakthroughs issue, in which it describes the top ten scientific breakthroughs, from all fields and journals – from astrophysics to zoology – as chosen by its editorial staff. This year, research by **Steven Reiner, M.D.**, professor of medicine, and his colleagues made the list at number seven. Reiner, who is also chair of the Immunology Graduate Group and a member of the Abramson Family Cancer Research Institute, published a study last March that demonstrated how cells of the immune system solve the problem of eliminating an infection without being depleted in the process. Reiner and his lab discovered that when immune cells divide, their daughter cells differ in how they inherit proteins from the mother cell; this difference determines their decision to fight to the death in eliminating an infection – or to live to fight another day in case the infection returns.

Says Reiner, “Knowing this could improve our strategy for developing vaccines to prevent both infections and cancer.”

Arthur H. Rubenstein, M.B.,B.Ch., executive vice president of the University of Pennsylvania for the Health System and dean of the School of Medicine, has been named chair of the board of directors of the Association of Academic Health Centers. He has led the Association of Professors of Medicine, the Association of American Physicians, and the American Board of Internal Medicine.

Donald F. Schwarz, M.D., M.P.H., M.B.A., associate professor of pediatrics and vice chair of the Department of Pediatrics, was appointed deputy mayor of health and opportunity and health commissioner by Philadelphia’s new mayor, Michael Nutter. Schwarz’s mandate is to coordinate health policy and improve the delivery of health and social services. At The Children’s Hospital of Philadelphia, Schwarz serves as deputy physician-in-chief and chief of the Craig-Dalsimer Division of Adolescent Medicine. Schwarz was a Robert Wood Johnson Foundation Clinical Scholar at Penn from 1985 to 1987, and he earned his M.B.A. degree from The Wharton School in 1987.

Ben Z. Stanger, M.D., Ph.D., assistant professor of medicine, received a 2007 Career Development Award from the American Association for Cancer Research. Jointly sponsored by the AACR and the Pancreatic Cancer Action Network, the award provides a two-year grant of \$100,000 to assist Stanger in his investigation of the pancreatic “ductome.” He seeks to compare the putative precursors of pancreatic cancer with their normal embryonic and adult pancreas counterparts. The support will allow him to explore this question as part of a broader interest in the relationship

between cancer development and embryonic development. Stanger is a member of the Cell and Molecular Biology Graduate Group at Penn.

Barbara J. Turner, M.D. '78, professor of medicine and director of the Primary-Care Physician-Scientist Fellowship, was elected to the board of regents of the American College of Physicians, the national organization of internists. The board of regents is the college's main policymaking body; regents may serve two three-year terms. Board-certified in internal medicine, Turner has been, since 1991, a Fellow of the American College of Physicians, in recognition of continuing individual service and contributions to the practice of medicine. She specializes in research on quality of care.

Flaura Koplin Winston, M.D. '88, Ph.D., associate professor of pediatrics, was named the recipient of a 2007 John M. Eisenberg Patient Safety and Quality Award. The awards are presented by The National Quality Forum and The Joint Commission. Winston is the founder and scientific co-director of the Center for Injury Research and Prevention (formerly TraumaLink) at The Children's Hospital of Philadelphia.

She was recognized for her lifelong professional commitment [to] combining public health, biomechanical engineering, and psychologic methodologies to promote safety and prevent injury among children from motor vehicle crashes. Winston established Partners for Child Passenger Safety, a research-to-action program; its crash surveillance system today contains data from more than 500,000 crashes involving children. The research findings have informed better safety design, as well as new legislation and regulations.

Welcome to the Institute

Four members of the School of Medicine faculty were elected members of the Institute of Medicine, one of the nation's highest honors in biomedicine. The new members bring Penn's total to 62.

"Penn is privileged and proud that four of our most distinguished physician-scientists have been named to one of America's premier institutions," said Arthur H. Rubenstein, M.B.,B.Ch., executive vice president of the University of Pennsylvania for the Health System and dean of the School of Medicine.

The new Penn IOM members are:

David A. Asch, M.D., M.B.A., the Robert D. Eilers Professor of Medicine and Health-Care Management and Economics at the School of Medicine and the Wharton School, who serves as executive director of the Leonard Davis Institute of Health Economics; **Joel D. Cooper, M.D.**, professor of surgery and chief of the Division of Thoracic Surgery; **Lee A. Fleisher, M.D.**, the Robert D. Dripps Professor and Chair of the Department of Anesthesiology & Critical Care and professor of medicine; and **Katherine A. High, M.D.**, the William H. Bennett Professor of Pediatrics and director of the Center for Cellular and Molecular Therapeutics at The Children's Hospital of Philadelphia.

Asch teaches health policy at the Wharton School and practices internal medicine at the Philadelphia Veterans Affairs Medical Center, where he is co-director of the Center for Health Equity Research and Promotion. He also co-directs the Robert Wood Johnson Health & Society Scholars Program at the University of Pennsylvania. His research aims to understand how physicians and patients make medical choices in clinical, financial, and ethically charged settings, as well as how health policies affect equity and quality.



Asch



Cooper

Known for his pioneering contributions to the field of thoracic surgery, Cooper has received the Jacobson Innovation Award from the American College of Surgeons and the Scientific Achievement Award from the Society of Thoracic Surgeons. His particular interests include general thoracic, esophageal, and tracheal surgery, lung cancer, and swallowing disorders. A former president of the American Association for Thoracic Surgery, he serves on the editorial board of several professional journals and is a co-editor of the *Pearson Textbook of Thoracic Surgery*.

Fleisher is chair of the American Heart Association/American College of Cardiology Guidelines on Perioperative Cardiovascular Evaluation before Non-Cardiac Surgery. Editor of *Evidence-Based Practice of Anesthesiology* and the 5th edition of *Anesthesia and Uncommon Diseases*, he is also the co-editor of *Essence of Anesthesia*



Fleisher



High

Practice and the forthcoming *Perioperative Medicine: Managing for Outcomes*. He is considered to be one of the world's authorities on how the heart responds to the stress of surgery.

A Howard Hughes Medical Institute investigator, High is a former president of the American Society of Gene Therapy. Her studies of the molecular biology of hemophilia led to clinical trials of gene therapy for the bleeding disease at Children's Hospital. She leads a laboratory funded by the N.I.H. and has contributed scores of papers to the scientific literature.

The Institute of Medicine was established in 1970 by the National Academy of Sciences to honor professional achievement in the health sciences and to serve as a national resource for independent analysis and recommendations on issues related to medicine, biomedical sciences, and health.

Advancers of Science

Two members of Penn's medical faculty have been named Fellows of the American Association for the Advancement of Science. They are among the 471 individuals recognized for their scientifically or socially distinguished efforts to advance science or its applications. They were officially inducted into the association in February.

Morris J. Birnbaum, M.D., Ph.D., the Willard and Rhoda Ware Professor of Diabetes and Metabolic Diseases in the Department of Medicine, serves as associate director of the Institute for Diabetes, Obesity, and Metabolism and as an investigator with the Howard Hughes Medical Institute. He was cited for "distinguished contributions to our understanding of the regulation of glucose transport and metabolism and aspects of cellular regulation relevant to insulin resistance and diabetes."

Yale E. Goldman, M.D., Ph.D., a professor of physiology, serves as director of the Pennsylvania Muscle Institute. He was cited for "distinguished contributions in molecular motor research, development of new technologies for biophysics, and service in scientific societies, journal editing, and organization of scientific meetings."

AcademyHealth Honors Penn Faculty and Alumni

AcademyHealth, a professional society for health services researchers, policy analysts, and practitioners, presented four awards at its 2007 annual research meeting. The society honored two Penn faculty members and a Penn alumnus.

Mark V. Pauly, Ph.D., the Bendheim Professor in the Department of Health-Care Systems at the Wharton School, received the Distinguished Investigator Award. Pauly has made significant

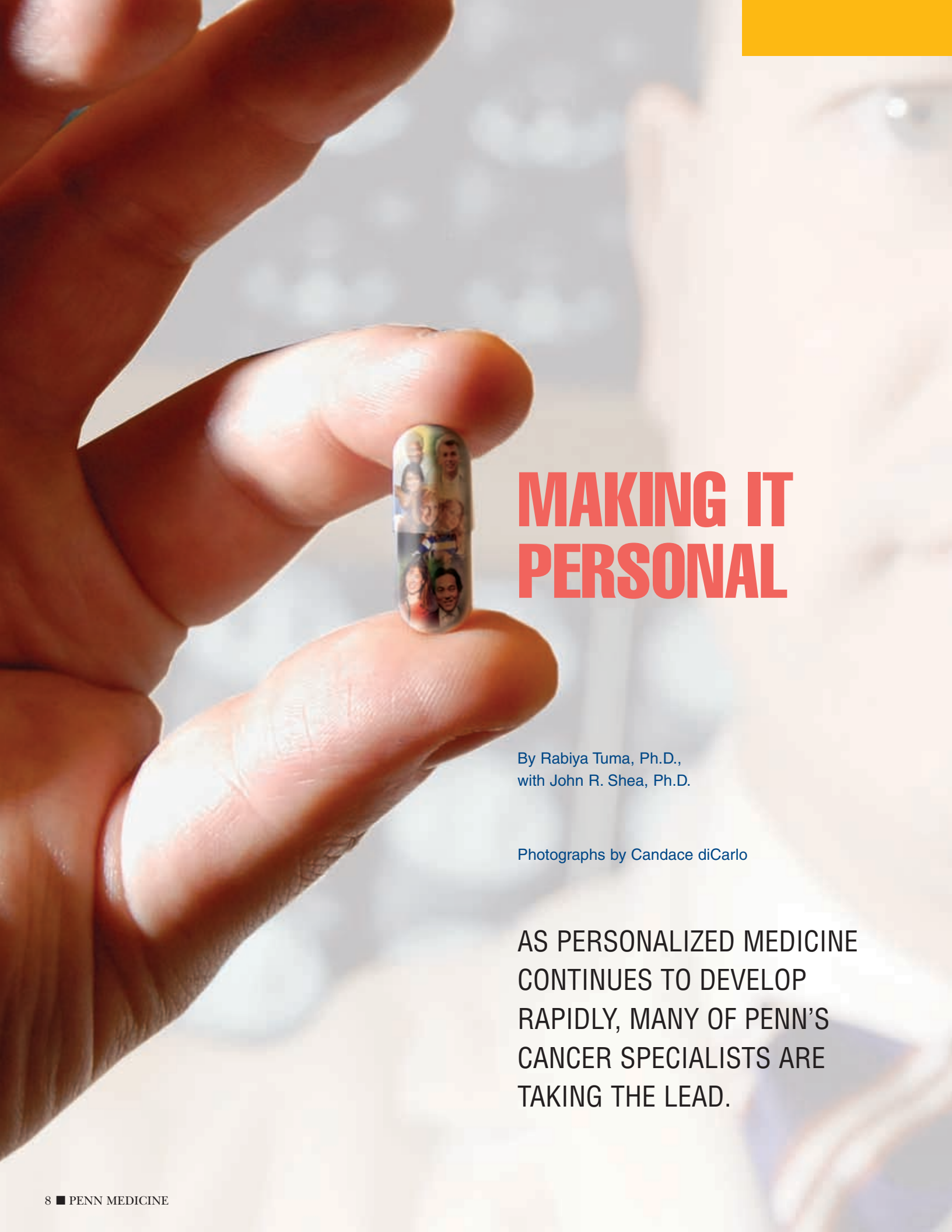
contributions to the fields of medical economics and health insurance and has examined the influence of medical care and health practices on health outcomes and cost. He is a senior fellow in Penn's Leonard Davis Institute of Health Economics.

Kevin G. Volpp, M.D. '98, Ph.D., assistant professor in the Department of Medicine and in the Department of Health-Care Systems, is also a core faculty member of the Center for Health Equity Research and Promotion at the Philadelphia VA Medical Center. He received the Alice S. Hersh New Investigator Award. Volpp's research program focuses on two main areas: the impact of organizational and financial changes in the health-care system on quality of care; and the effects of financial incentives on health behavior. He earned his doctorate in public policy and management from Wharton.

John Hsu, M.D. '95, M.B.A., G.M.E. '99, received the Article of the Year Award for being the lead author of "Unintended Consequences of Caps on Medicare Drug Benefits," published in *The New England Journal of Medicine* (June 1, 2006). He is a physician-scientist at the Kaiser Division of Research, a fellow at the Kaiser Institute for Health Policy, and a faculty member at the Institute for Health Policy Studies and the Department of Epidemiology and Biostatistics at the University of California at San Francisco. Hsu also earned his M.B.A. degree at Penn.

Correction:

In "The Last Word: The Pursuit of Excellence" in the Fall 2007 issue, there was an editing error in Dean Arthur Rubenstein's comments on the late Stanton Segal, M.D. It was Leon E. Rosenberg, M.D., former dean of Yale University School of Medicine, who was trained by Dr. Segal at the N.I.H., not Leon Eisenberg, M.D. '46. We regret the error.



MAKING IT PERSONAL

By Rabiya Tuma, Ph.D.,
with John R. Shea, Ph.D.

Photographs by Candace diCarlo

AS PERSONALIZED MEDICINE CONTINUES TO DEVELOP RAPIDLY, MANY OF PENN'S CANCER SPECIALISTS ARE TAKING THE LEAD.

Keith Flaherty, M.D., displays drugs in the growing arsenal of targeted therapy.



It was a grim picture that oncologist Keith T. Flaherty, M.D., presented. Typically, he said, persons with advanced melanoma, the most deadly form of skin cancer, “have relatively a short time to live.” Melanoma is now three times as common as it was 40 years ago, and today there is still no therapy that has proven to be broadly effective once the disease has spread to internal organs. In addition, melanoma often recurs in patients after initial surgery to remove it.

That was the scenario Flaherty sketched at a media luncheon organized by PENN Medicine’s Department of Public Affairs in June 2003. But Flaherty had some progress to share. “It’s been an exciting time for us in the last few months,” he said. Flaherty, now an assistant professor of medicine and a program leader in the Experimental Therapeutics Program of the Abramson Cancer Center of the University of Pennsylvania, was eager to report that some of the drugs he was investigating showed “striking effects against melanoma.”

For the last 30 years, he said, investigators have been looking for the causes of the abnormalities in cancer cells. Earlier in this decade, gene researchers at the Sanger Center in the United Kingdom discovered that about 70 percent of melanomas have a mutation in the gene that produces Raf kinase, an enzyme that triggers cellular growth. That clue led Flaherty and other Penn researchers like Peter O’Dwyer, M.D., to test an investigational drug called BAY43-9006 in combination with the standard chemotherapy that had not worked against melanoma. When administered simultaneously, the drug, now called Nexavar (sorafenib), allowed the chemotherapy to be more effective. Some tumors even seemed to regress completely.

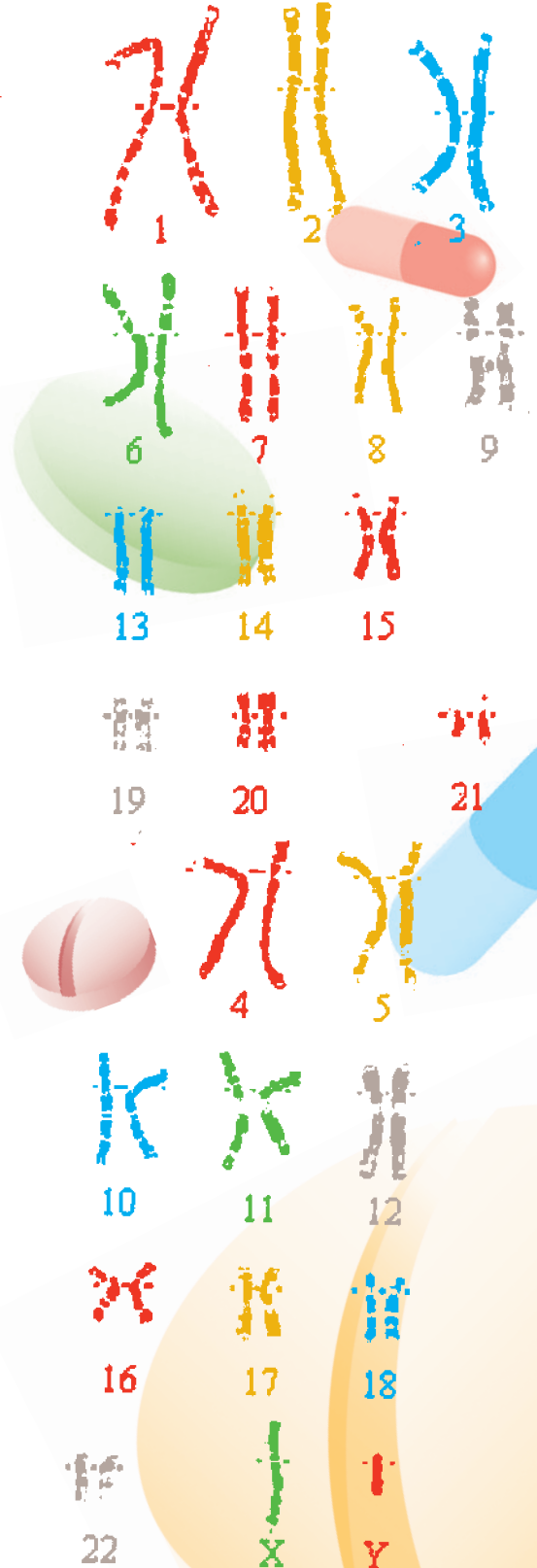
What Flaherty was developing is a form of “targeted therapy,” in which investigators look for molecular abnormalities that

cause diseases and corresponding treatments to combat or prevent them. But as effective as it was for some patients, the combination treatment did not have the same effects on others. The next step has been to take targeted therapy into the realm of personalized medicine, another phrase whose use has exploded in recent years. Flaherty is now leading a large nationwide trial through the Eastern Cooperative Oncology Group to test the combined approach in patients with advanced melanoma. In that trial, patients’ tumor material removed by previous surgery is being gathered in order to analyze the mutations within each patient’s melanoma. This analysis is being led by Katherine Nathanson, M.D. ’93, also in the Abramson Cancer Center. It will determine the genetic make-up of patients who respond best to this therapy.

In a recent interview, Flaherty explains the progression, noting that the pattern of uneven therapeutic benefit is frequently seen in other treatments as well. “The drug will work tremendously well for a subset of patients, okay for another subset of patients, and won’t seem to really work at all for another.” Therefore, learning how to distinguish more precisely among patients – or their tumors – is crucial in the development of personalized care. In fact, as Flaherty sees it, personalized medicine, when broken down to its most basic components, simply refers to parsing patients into smaller and more uniform groups and then treating them in a manner that will work best for each group.

A new paradigm, a new age?

To judge by the proliferation of reports in the media, including articles in both



the professional and popular magazines, the Age of Personalized Medicine is already upon us. In fact, there is a web site called The Age of Personalized Medicine, a “service” of Personalized Medicine Coalition, a new organization based in Washington, D.C., and innovation.org. When Andrew von Eschenbach, M.D., G.M.E. ’68, was acting commissioner of the Food and Drug Administration in May 2005, he posted a column on U.S. Medicine Information Central called “FDA at Regulatory Post of New Era of Personalized Medicine.” In recent weeks, the phrase “personalized medicine” has registered from 282,000 to 529,000 results on Google, depending on whether it’s enclosed in quotation marks.

In the past few months, several conferences and programs have examined various aspects of the topic. For example, Personalized Medicine Coalition, which describes itself as representing “a broad spectrum of academic, industrial, patient, provider, and payer communities,” sponsored “21st Century Medicine: Personalized and Evidence-Based” in September in conjunction with the Georgetown University. Speakers included representatives from pharmaceutical and other industries as well as several prominent government figures, among them, Michael O. Leavitt, the U.S. Secretary of Health and Human Services.

Another recent conference, “Personalized Medicine: A Call to Action,” was held at Harvard, sponsored by the Harvard Medical School-Partners Healthcare Center for Genetics and Genomics and the Harvard Business School. Leavitt was the keynote speaker. Edward Abrahams, Ph.D., executive director of Personalized Medicine Coalition, took part in a couple of roles. The political aspect of personalized medicine was suggested by the presence of the health policy advisor for Senator Barack Obama. In August 2006, Obama introduced legislation that, he asserted, would help scientists tap the



Mitchell Schnall, M.D., Ph.D., left, consults with Mark Rosen, M.D., Ph.D., and Jonathan Dorff, M.D.

Judging By Appearances

While most oncology researchers are busy trying to characterize tumors based on their molecular traits, Mitchell D. Schnall, M.D. ’86, Ph.D. ’86, the Matthew J. Wilson Professor of Research Radiology M.D., is focusing on the *appearance* of the tumors. “Traditionally we have characterized tumors by taking bits of tissue and having pathologists look at them, looking at markers on cells, and now, more and more, by genetics,” says Schnall. “Radiologists who read images know there are lots of things we see in terms of macroscopic structure of a tumor and things we can measure about its metabolism that are not necessarily being well applied in the paradigm of characterizing tumors.”

Schnall aims to change that paradigm by developing what he calls an imaging phenotype. As he currently conceives

power of genomics to find treatments for diseases and would greatly increase funding for research, eliminate regulatory obstacles, and create incentives to accelerate innovation by the private sector.

Along these lines, a recent article in the *Harvard Business Review* (October 2007) was called “Realizing the Promise of Personalized Medicine.” The subtitle: “Breakthrough targeted therapies could save many lives and a great deal of money. Obsolete business models, regulations, reimbursement systems, and

it, the imaging phenotype will include a variety of information about the tumor, all of which can be gleaned through magnetic resonance imaging (MRI), positron emission tomography (PET), and other imaging techniques.

To illustrate his idea, Schnall points out how much information we would lose if we only noticed the length of someone’s nose or the color of his or her eyes, rather than looking at the whole face. The same thing is true with medical imaging. By looking only at the size or location of a tumor, researchers are missing a good deal of the information that’s available to them – some of which could help identify key subgroups of patients for subsequent treatment. For example, breast-cancer tumors show inconsistent features. Some tumors have clear smooth borders, other have ragged edges. Some

physician behavior stand in the way but can be overcome.”

It may be that public wariness is another obstacle that must be overcome by the advocates of personalized medicine. A conference in London in October, “Genomics and Society: Today’s Answers, Tomorrow’s Questions,” included a study that found that many segments of the British population had strong concerns about the increased responsibility that would come from being able to discover that they were susceptible to a particular

grow in balls and some grow in sheets along breast ducts. Some have most of their metabolic activity and blood flow at the periphery, others have a more uniform distribution.

Schnall doesn't know why the different tumors act the way they do, but he thinks these features may help distinguish relatively uniform patient groups that would respond to particular therapies. To demonstrate the potential value of the project, he took MRI scans of approximately 40 breast tumors. He then compared the different imaging characteristics to the likelihood that a given tumor was triple negative – that is, negative for three common markers, estrogen, progesterone, and HER2/neu. Some aspects of the imaging phenotype occurred more frequently in triple-negative tumors. Although clinicians already have the tools to identify triple-negative disease, Schnall's results show that the imaging phenotype can also be used to segregate breast tumors into distinct classes. The possibility is that the approach could also sort and identify previously unrecognized classes that would respond in a unique way to different treatments.

"This is at a very early stage of development," says Schnall. But he believes that the proof of principle is there.

— R. T.

diseases. According to the study, "Contrary to much of what is written and said about personalised medicine, members of the public highlighted how such promised options would impact and place strains on their families and relatives, as well as potentially lead to stigmatisation."

Penn's School of Medicine has been a little ahead of the curve on some matters related to personalized medicine. Last spring, the Institute for Translational Medicine and Therapeutics held a symposium called "Personalized Medicine:

Boon or Pipe Dream?" The panelists came from Penn and from around the nation, as well as from the United Kingdom, representing academe, research institutes, hospitals, and drug firms. Among the general themes were "Novel Paradigms of Drug Development" and "Variability in Human Drug Response."

The sense of ambivalence in the symposium's overall title is reflected in subsequent comments by Garret A. FitzGerald, M.D., director of the sponsoring institute and chair of the Department of Pharmacology. "Personalization of medicine has a catchy ring about it and falls trippingly off the tongue. It is a seductive concept and easy to overhype. However, it is a highly complex task presenting medical, technical, social, and political hurdles. Its realization will occur in a stuttering fashion – rapid progress in some areas contrasting with frustrating delays in others." FitzGerald does concede that "the general move towards a more stratified approach to the use of drugs and devices seems inevitable. Revolutions in our ability to reflect differences in drug response amongst and within individuals combined with access inexpensively to genomic information and the computational ability to digest and integrate information will change radically the way that we treat and prevent human disease."

The challenge of cancer

Cancer presents an opportunity for personalized medicine – but a challenge, too. According to the most recent statistics from the American Cancer Society, deaths because of cancer declined by 1 percent between 2004 and 2005 and by more than 2 percent between 2002 and 2004. The latter rate of decline is nearly double the decline in deaths seen between 1993 and 2002. That improvement, experts say, is due to improvements in early detection and better treatments.

The catch is that not all cancer patients benefit equally. "Approximately 50 percent of cancer patients can be treated successfully with standard therapies," says Craig B. Thompson, M.D., director of the Abramson Cancer Center and the J. Samuel Staub, M.D., Professor of Medicine. "The role for Penn and research institutions like Penn is to develop treatments that improve the outcome for the other 50 percent."

One way to meet that goal is to personalize cancer care so that patients receive customized treatments that will most likely work for them. Although individualized treatment may seem like a prerequisite of all care, it has only become possible for most cancers as scientists have gained a better understanding of tumor biology and have gained access to data from the human genome project. With that foundation, cancer researchers are building tools to define tumor types more narrowly and design treatments that attack each cancer in ways that hurt it most.

Finding the target

Tumors grow and spread because the molecular pathways that normally regulate cell proliferation are out of whack. In some unusual cancers, the aberrant growth results from a mutation in a single gene. More frequently, however, researchers are finding that each cancer cell carries many mutations. Thus, an important step in developing personalized medicine is figuring out which mutations within a particular tumor are responsible for its growth – in other words, the "drivers." Once a driver is known, researchers work to develop a drug that specifically reverses or neutralizes the problem it causes. Although not all strategies for personalized medicine rely on targeted drugs, they are a large part of personalized medicine.

A successful example of this targeted approach is the drug Herceptin (trastuzumab), which has been used for breast cancer

treatment since 1998. The drug binds to a receptor protein on the cell surface, called HER2/neu, which is overly abundant in some breast cancers. Approximately one-quarter of women whose tumors over-express the HER2/neu protein respond well to Herceptin. And for these women, the drug changes a very aggressive form of breast cancer into a treatable one.

The goal now is to expand the number and type of targeted therapies available – and it's in this area that Keith Flaherty has been a leader in testing targeted therapies for kidney cancer and for melanoma. As noted, one of his focuses is B-Raf, a tyrosine kinase enzyme that, when activated by an outside signal or mutated, increases the rate of cell division. Beyond melanoma, researchers have found that 7 percent of all human tumors, including 15 percent of colon and ovarian cancers, harbor similar mutations in B-Raf. Any drug that blocks B-Raf, therefore, will likely work as well in many of those patients.

“This is an important discovery to try to capitalize on in cancer,” says Flaherty.

While the personalized approach might improve the chances of recovery, patients still have to take standard chemotherapy, which significantly compromises their quality of life. And that is why Flaherty is in the hunt for a better B-Raf inhibitor. Last summer he launched early trials to test the safety of two novel B-Raf inhibitors that had not previously been tested in humans – RAF-265 and PLX4032. It is too early to say whether the drugs will improve survival or slow the disease in patients. A hopeful sign: both agents do turn off the mutant B-Raf enzyme. That, Flaherty says, could bode well for their anti-cancer activity.

If the B-Raf inhibitors continue to show promise, the next challenge Flaherty will face is to identify exactly which melanoma patients will benefit from the drug. Ideally, any patient whose tumor has a B-Raf mutation will respond

to the drug. But the presence of additional driver mutations could limit the drug's potency. In other words, inhibiting B-Raf by itself could work better in some patients than in others.

Matching therapies and patients

Breast oncologists already use a variety of subdivisions in standard care. For example, tumors are regularly tested for the presence of estrogen receptors, progesterone receptors, and (as mentioned earlier) HER2/neu protein. For women whose tumors express one or more of those proteins, specialized treatments are already available, including Herceptin and hormone therapies. “We are learning something about the molecular components of the tumor and then actually pulling out certain subgroups of patients who get very specific treatments,” says Angela M. DeMichele, M.D., M.S.C.E. '01, assistant professor of medicine and co-program leader of the Breast Cancer Program.

Specialized treatments, however, are not yet available for all breast cancer subgroups. For example, patients whose tumors are negative for all three markers cited above – called “triple negatives” – currently receive standard chemotherapy. And although many respond initially to therapy, they are 3.2 times more likely to die of their disease than patients with other types of breast cancer, according to researchers from the University of Toronto Sunnybrook Health Sciences Center.

Although no single gene or molecular pathway has been identified as the cause of this aggressive form of breast cancer, DeMichele recently launched a clinical trial to test a combination of two existing drugs in the hopes that they will improve the outcomes for patients. Combining Abraxane (paclitaxel protein-bound) and Avastin (bevacizumab) in triple-negative patients, the trial builds on traditional therapies for breast cancer while taking advantage of increased understanding of tumor biology.



Caryn Lerman, Ph.D., works to help patients quit smoking.

Can Personalized Medicine Help Prevent Lung Cancer?

Drug companies have come up with a variety of nicotine patches, inhalers, gums, and other aids to help smokers quit. But even with those supports, not everyone who tries to quit succeeds. Caryn Lerman, Ph.D., deputy director of the Abramson Cancer Center and director of the N.I.H.-funded Transdisciplinary Tobacco Use Research Center at the University of Pennsylvania, believes that genetic differences between smokers may partly explain the variable success rate. And her approach to the problem is likely to improve and “personalize” therapies that help smokers who want to quit.

Several enzymes, including cytochrome P450 2A6 (CYP2A6), break down nicotine in the bloodstream of smokers. But not everyone has the same levels of CYP2A6 enzyme. Smokers who have the more common form of the gene that codes for this enzyme metabolize nicotine more rapidly than smokers who carry a genetic variant. Lerman and colleagues suspected that these faster metabolizers would not benefit much from a nicotine-based therapy, like a patch, because their blood levels of nicotine from this treatment would be too low, resulting in stronger cravings to smoke.

To test that hypothesis, they measured the ratio of two nicotine by-products

(from smoking) in the blood of smokers participating in a smoking-cessation trial with nicotine patches. Using that ratio, they were able to identify “slow” and “fast” nicotine metabolizers. When they compared the results of the ratio test between smokers who were able to quit and stay off tobacco for six months and those who relapsed, they found that slower metabolizers were more likely to benefit from a standard dose of the nicotine patch; on the other hand, faster metabolizers did not benefit.

In a subsequent study, Lerman reports, her research team validated the finding and found that “smokers who are not good responders to the patch – because they are fast metabolizers – are actually excellent responders to the drug bupropion or Wellbutrin.” Nicotine replacement therapy reduces cravings by putting nicotine back into the system; on the other hand, bupropion, a non-nicotine medication, treats the symptoms of nicotine withdrawal.

The study also found that faster metabolizers who receive counseling alone also have a higher risk of smoking relapse. “But if they receive a medication that reduces the symptoms of nicotine withdrawal and abstinence, it reduces that liability to relapse.”

Lerman’s team plans to test whether smokers whose treatment is guided by the metabolism test have a better rate of success than those treated with a standard, non-personalized approach. If the results support it, the pharmacogenetic, personalized approach may soon be in clinics.

In recognition of this work, Lerman, who is the Mary W. Calkins Professor in the Department of Psychiatry and the Annenberg School for Communication, received the 22nd Annual Alton Ochsner Award Relating Smoking and Health from the American College of Chest Physicians in October and the American Cancer Society – Southeastern Division Cancer Control Award this year.

— R. T.

Abraxane is similar to a widely used breast-cancer drug called Taxol, except that the active ingredient in Abraxane is encased in a benign protein called albumin. The albumin improves the solubility of the active ingredient, called paclitaxel. This is an important step because the drug usually has to be suspended in a rather noxious solution that can cause severe allergic reactions in some patients. In addition, the albumin acts a bit like a pharmacologic Trojan horse. Cancer cells have a receptor on their surface that binds to albumin and transports it into the cell interior. When paclitaxel is surrounded by albumin, the cell-surface receptor actively concentrates the drug in the cancer cells, precisely where it is needed. And because normal cells don’t express much of the albumin receptor, they escape most of the drug’s toxic effects.

The second drug in DeMichele’s combination, Avastin, is already being used successfully to treat several cancers, including breast cancer. Avastin, which is called an angiogenesis inhibitor, remodels the tumor’s vasculature, pruning off small branches and forcing the tumor to rely more heavily on the main vessels. This shift to the main vessels actually improves the blood flow through parts of the tumor and increases delivery of other drugs, like Abraxane.

“It is like a one-two punch,” DeMichele says. Because the combination works on tumor biology that is shared by a variety of breast-cancer subtypes,

breast-cancer patients other than those with triple-negative tumors may benefit from the therapy as well. DeMichele decided to focus on triple-negative patients because they have few effective options, and so far no key molecular traits have been uncovered in these tumors. She points out, however, that the Breast Cancer Program is running several other studies that are targeted to specific tumors or patient populations.

Turning a tumor’s advantage against it

One of the newest approaches in personalized cancer care is using the patients’ genetics, rather than the tumor’s mutations, to guide therapy. For example, several research teams showed recently that patients who are born with particular gene variants are more likely to respond to chemotherapy treatments and more likely to suffer from the toxic side effects of those same drugs.

In a spectacular twist on cancer genetics, researchers are trying to turn a gene for breast-cancer susceptibility into a poison for those very same tumors. Scientists know that women who inherit a defective copy of either the BRCA1 gene or the BRCA2 gene from one of their parents have a very high risk of developing breast and ovarian cancer during their lifetime. (For example, the highest risk is for women with an altered BRCA1 gene, who are estimated to have between a 50 and 85 percent risk of developing breast

Angela DeMichele, M.D., shown with patient Roxann Albadri, has tried a two-drug combination to improve outcomes.



cancer by age 70.) But once a woman develops a cancer, she receives standard treatment for that cancer, regardless of her BRCA1 or 2 status.

Now, however, an international team of researchers, including Susan M. Domchek, M.D., associate professor of medicine at Penn and director of the Abramson Cancer Center's Cancer Risk Evaluation Program, is testing whether patients with a BRCA mutation will respond to a new class of drugs called PARP inhibitors.

Because cells must keep their chromosomes intact, they have evolved several different ways to repair breaks in their DNA. The BRCA genes are required for one type of DNA repair and the PARP protein for another. "In BRCA mutant tumors, where you don't have any functional BRCA1 or 2, you've knocked out one entire DNA repair mechanism," explains Domchek, who is leading the PARP inhibitor trial at Penn. "By using a PARP inhibitor, you knock out a second DNA repair systems seems to be too much for the cancer cells. "Essentially the tumors pretty much fall apart, at least *in vitro*."

Domchek says the trial is one of the most exciting things she's been part of because it takes information that predicts a woman's increased risk of cancer and uses it potentially to improve her therapy.



Susan Domchek, M.D.

As far as Domchek knows, the PARP trial "really is a key proof of principle that you could do something like that, to use inherited susceptibility to determine how to treat a cancer that develops."

Instigating an immune system attack

Instead of turning the tumor against itself, Carl H. June, M.D., professor of pathology and laboratory medicine and director of translational medicine at the Abramson Family Cancer Research Institute, is working with colleagues to unleash the power of the patients' immune systems on the tumor. The immune system evolved to fight invading pathogens, such as bacteria and viruses. But researchers know that, in some cases, the immune system also recognizes cancer cells as invaders and can control their growth by killing some of the tumor cells. The key is revving up that natural response.

Scientists have been trying for more than 50 years to develop a therapeutic vaccine that can be used to boost this anti-cancer activity of the immune system. June believes his team is on its way to success. The investigators have developed a way to isolate key immune cells, called T lymphocytes, from the blood of patients and grow them in culture. By growing the cells in the presence of particular proteins or cytokines, which stimulate immune cell receptors, the scientists activate the lymphocytes and induce them to proliferate. The result is many more T lymphocytes than would normally arise in the blood system.

If the researchers first vaccinate the patient with a protein called hTERT that is specifically expressed in cancer cells, then a significant fraction of the T lymphocytes that are subsequently isolated from the patient will recognize that protein. As a result, when the amplified cells are returned to the patients, they will seek out the tumor cells that express hTERT protein and kill them.



Robert Vonderheide, M.D., D.Phil., left, and Carl June, M.D., patient's immune system against cancer.

June and Robert H. Vonderheide, M.D., D. Phil., assistant professor of medicine at Penn, who developed the hTERT vaccine, are currently testing the strategy in patients with multiple myeloma, in conjunction with Edward Stadtmauer, M.D. '83, professor of medicine, and Dan Vogl, M.D., instructor in medicine. First, the patients who have recently undergone an autologous stem-cell transplant are immunized with the vaccine. A couple of weeks later, the researchers isolate T lymphocytes from each patient's blood. After stimulating and expanding the T cells, they inject them back into the individual patients. Because of the initial immunization, many of the T cells will be primed to recognize the hTERT and thus will attack the myeloma cells.

If all goes as planned, the vaccine and T cell strategy should reduce the relapse rate in patients following their transplants. At present, half of all multiple myeloma patients relapse within 18 months of transplant, so any improvement or delay could be significant.



make use of a newly developed vaccine to stimulate a

Personalized doesn't mean individualized

While the promise of personalized medicine lights up the eyes of many patients, their advocates, and even many physicians, Craig Thompson, director of the Abramson Cancer Center, hesitates noticeably when asked about the topic. He agrees wholeheartedly that it is the way of the future for treating cancer, but he also knows that the subject often leads to confusion. In particular, many people believe that the approach means they will receive a treatment designed individually for them. A headline in *Newsweek* (June 10, 2005) enforces this exaggerated idea of personalized medicine: "Medicine Tailored Just for You." That notion, although in line with the American ideal of individuality, is not realistic.

The only way a researcher can know if a treatment works is to test it on a group of carefully selected patients. If the new regimen works, the patients will do better than those treated with standard therapies. That means that therapies have to be designed for and tested in *groups*

of patients, rather than in individuals. Even in the case of immune therapies, which rely on stimulating an individual's immune cells, the approach is uniformly applied to a group of patients.

Those caveats, Thompson emphasizes, don't mean that personalized medicine is less likely to work. In fact, the opposite. By dividing patients into narrowly defined subgroups based on their tumor mutations, the patients' genetics, or some other characteristic, researchers are having greater success finding tools to destroy tumor cells. "By understanding the genome and what goes wrong in cancer," says Thompson, "we are going to have a whole new set of therapies that don't just non-specifically damage cells, but are designed to harm only those cells that carry the mutations driving the cancer."

Looking Ahead

As indicated by the subtitle of last spring's symposium at Penn, "Boon or Pipe Dream?," there are still many complex matters to resolve before the Era of Personalized Medicine becomes fact. In addition to the more technical sessions, the symposium ended with a somewhat more questioning program called "Prospects for Personalized Medicine." Arthur L. Caplan, Ph.D., chair of Penn's Department of Medical Ethics and director of the Center for Bioethics, raised issues of cost and access, as well as the "clever and creative ways" personalized medicine – or phony versions of it – will be marketed.

Alastair J. J. Wood, M.D., professor of medicine at Cornell Medical School and managing director of Symphony Capital, noted several "untested or untrue assumptions" about personalized medicine: for example, that drugs have only one effect; that genetics overwhelms environment; that single genotypes explain all or most variability in responses to drugs. Wood also suggested that personalized medicine could upset the pricing

model for drugs. Given a significantly smaller population, would a drug company need to charge 10 times as much for its product?

Along these lines, James P. Evans, M.D., Ph.D., in a recent article in *The Journal of the American Medical Association*, argues that "individualized medicine" undermines the traditional system of health insurance: "By learning to identify an individual's risks, that individual becomes less attractive to insure for the very maladies for which they require coverage" (December 12, 2007).

At the same time, there are powerful groups pushing hard for personalized medicine. The F.D.A., for example, has created the Critical Path to Personalized Medicine. Michael O. Levitt, the H.H.S. secretary, asserted in an interview with *The Age of Personalized Medicine* in March 2007 that "we're on the threshold of a new era. . . . These great leaps will enable us to give better care to all patients – by targeting the unique biology of every patient." (He appears to emphasize the *individual* aspect of personalized medicine more than those with a more conservative view.) Leavitt also noted that "current efforts at H.H.S. agencies supporting personalized health care total \$277 million this year, and are proposed to grow to \$352 million in FY 2008."

Leavitt admits that "there's a lot of work that needs to be done," including a fuller understanding of "the interactions between our genes, and the environment, and our lifestyle." He cites the need to establish a federal law to prevent genetic information from being used – in an "unfair way" – to deny insurance or employment. To a great extent, personalized health care will depend on "public trust."

In the meantime, many of Penn's clinicians and researchers, in oncology and beyond, are using their skills to advance personalized medicine – for the benefit of the persons they treat. ♥

*Four PENN Medicine People
Consider the Immense Potential
of the Capital Campaign*

Where We Are, Where We're Headed

By Nicole A. Gaddis

Photographs by Tommy Leonardi



Clockwise, from upper right: Patty Salmon; Andrew Kofke; Robert Vonderheide; and Ted Madara.

The day before the launch of PENN Medicine's \$1 billion campaign in October, four individuals representing different aspects of the institution – a former patient and active volunteer, a medical student, a clinician and professor of anesthesiology, and a physician-scientist – sat down for a quiet roundtable discussion. The questions to be considered: What was it like to be a part of the PENN Medicine community, and how could this campaign have an impact on their lives?

There was much to learn as Ted Madara, a former patient; Patty Salmon, a medical student; W. Andrew Kofke, M.D., M.B.A., professor of anesthesiology and critical care; and Robert H. Vonderheide, M.D., D. Phil., assistant professor of medicine (hematology/oncology), shared their experiences at PENN Medicine and their thoughts about its future.

What brought each of you to PENN Medicine?

Ted Madara: On December 28th, 1983, I had a heart attack and was brought to the Hospital of the University of Pennsylvania because of its severity. I spent 60-some days in ICU, and I had such an overwhelming experience of security and safety, knowing my doctors and nurses were going to cure me. They added a lot of years to my life.

Around 1986 or '87, I joined the HUP Ethics Committee. Meanwhile I had been involved with the formation of the Institute on Aging and the Center for Bioethics, and I was also involved with Ralston House. I call Penn my second home!

Patty Salmon: I chose Penn for medical school because – I think the one word

that can sum it up is *innovation*. The curriculum was fresh and really reflected the fact that medical education has to change as medicine advances in terms of the technology and practice. Penn's School of Medicine also cares about what students think and works to integrate student feedback into the curriculum and student life.

Andrew Kofke: What brought me to Penn in 2000 was the academic environment and the academic tradition. The anesthesia department here is one of the oldest, most tradition-laden academic departments in the country, going back into the 1940s and '50s.

Robert Vonderheide: I joined Penn's faculty in 2001 as an assistant professor and started a research laboratory that was part of the Abramson Cancer Center and the Abramson Family Cancer Research Institute. Penn stood out because of its commitment to translational research, bringing discoveries out of the laboratory and into the clinic – which was a goal of mine and part of my training, so I wanted to capitalize on that.

Let's talk a moment about translational medicine. It's a term that we use quite frequently at PENN Medicine. How does it differ from the way research has generally been done?

Vonderheide: Of course all of medicine is translational; the development of penicillin is one of the great translational stories. But much of that "translation" in decades past had been based on empirical observations. With our tremendous

gain in knowledge of the molecular basis of pathology and diseases, we're now able to more wisely target and develop new therapies. That's happening more and more because of our accelerated understanding of molecular medicine, whether it's based on immunology, neurology, or cardiovascular medicine, for example.

This has created a need for physicians and scientists and many others in the field of translational medicine to understand and advance molecular medicine – and to test novel compounds and novel approaches in patients, not in an empirical way but in a scientific way. And I bet that's reaching down into the medical curriculum.

Salmon: I think that's partly reflected in the way Penn's medical school curriculum has changed. Students in the past would have separate classes on pharmacology and physiology and pathology, but now we have an organ systems approach.

So, for example, when you're learning cardiology, you start with the embryology of the heart. Then you learn physiology, patho-physiology, pharmacology – all of these fields are integrated. You can see through the progression of the curriculum how the understanding of the basic science has translated into modern therapy, to drug development, into our complete understanding of the cardiovascular system.

Madara: I think about what's going on in the Institute of Aging, with Dr. [John] Trojanowski and the work he's doing over there. He's looking at a whole array of different fields of medicine trying to understand Alzheimer's.



How important is collaboration in your experience at Penn?



Kofke: Dr. Trojanowski is a great example. Who would think that someone who does research into neurodegenerative diseases would have an interaction with anesthesiology?

John provided us with transgenic mice to study the various impacts of anesthetics on the brain because one of my colleagues discovered that anesthetics can make amyloid plaques precipitate, or separate, out in solution. This has led to studies looking at whether the plaques also precipitate out of the brain during anesthesia and if that accounts for some of the negative cognitive effects that have occurred in people after surgery. I don't know John very well, personally, but because of how PENN Medicine has built this collaborative community, we all know about each other and our work.

And Penn is a place where curious people are interested in asking questions and passing the knowledge onto the next generation. Really, what better way is there to impact patient care? Being at Penn, I can teach 50 people who go on to become teachers at other universities – my knowledge spreads geometrically.

I nominated David Smith, my colleague in neuroanesthesia, for a national teaching award from the Society for Neurosurgical Anesthesiology and Critical Care. We have records of all the 300 or so residents that he had taught over the

years – how many of them are academics and how many of them are chairs now. You know, he has had more of an impact on neuro-anesthesia practice than anyone else I know of, because neuro-anesthesia practitioners all over the world were taught by him. I'm sure there are other areas of medicine where Penn has made a similar impact.



Salmon: Our faculty are very involved with students and really become mentors. We have so many great faculty members who are down to earth, very accessible, and who really respect students. I can come up to any attending physician and say, "I'm having a problem with this particular patient," or "Such-and-such lab value came back – do you think it'd be OK if we started a certain drug?" Later I'll find out that this particular faculty member is a very important head of an organization or has published a hundred papers, or discovered a gene.

Vonderheide: One phrase that is emerging is, "From bench to bedside . . . and back again." It implies a dynamic nature to the process and means that patients are now part of the process, too. So we have to really engage our patients as part of research teams. And patients are actually very skilled at doing that. So the collaboration is not just between researchers and physicians, or between faculty and students. We now have a translational network team that includes the patients.

Madara: I think that's very important for Penn. When I talk to people about issues in medicine, one of the things I emphasize all the time is the fact that the research being done at Penn comes right across to patients. And if patients have the opportunity, they'd like to be a part of the process as opposed to just receiving the medicine.

It's ideal for patients. As a patient, I am looking for an organization that has research, medicine, the medical school faculty and students – all of it put together.

THE GOALS OF THE CAMPAIGN

PENN Medicine's capital campaign will allow the institution to:

Propel discovery through research on the most pressing medical challenges and leadership in translational medicine. Goal: \$480 million.

Promote health by strengthening Penn's patient-centered focus and creating new capabilities for excellence in clinical care. Goal: \$200 million.

Create knowledge by establishing new professorships that will attract and cultivate the best experts and support their research. Goal: \$120 million.

Prepare leaders by providing scholarship support to attract the world's best students and accelerating curricular innovations. Goal: \$200 million.

Vonderheide: Geography can be a huge component of successful collaboration. Having the new research tower located with the [Ruth and Raymond Perelman Center for Advanced Medicine] can really advance research. First, that center will allow care that's more convenient for our



patients: if you need, for your particular condition, a surgeon, an anesthesiologist, a radiologist, pathologist, or oncologist, you can see them all in one place instead of having to go around different parts of “the grocery store.” And that is a very patient-focused, collaborative notion of delivering care. It makes sense when you talk about delivering care, and it also makes sense in delivering research.

We do our best research when we work in a multidisciplinary way to study a particular hypothesis, a new drug, a new approach, or a new diagnostic. There are very important model systems that we study in a laboratory – everything from things growing in a test tube to animal models. Those are important and will never be replaced. But a key part of our studies are *humans*, our patients: lab results, biopsies, observing their reactions and progress. We need to be with the patients and we need our labs to be close by.

Let's say that the PENN Medicine campaign is successful. Where would you like that additional funding to go?

Kofke: I would like us to set aside resources to fund worthy research proposals that don't meet the NIH's increasingly stringent standards.

Vonderheide: I agree. Ten years ago, maybe 30 percent of grants were judged to have some merit. And now it's less than 10 percent. So let's just say that 30

percent of the grants are still worthy of funding. That means two-thirds of all worthy grants are not being funded.

One of the biggest crises that's happening right now is that young investigators in the laboratory are not being given the same opportunities because the funding is not available. There will be an entire generation of researchers who will not have the opportunities. So philanthropy is a growing part of support for our research efforts and the delivery of care.

Salmon: There are several things I would like to see. One thing I'd like to see is student debt cut. I also think more money should be put into tracks for the teaching faculty. From what I hear, this is a big problem: Faculty have a lot of teaching responsibilities, but in order to get tenure they need to do research. It's hard to strike that balance. People who want to focus on education should be able to instead of struggling to do both.

And I would like to see a lot of money go toward facilities for teaching. We have laboratory rooms where we do all of our pathology and histology classes with microscopes, we do our anatomy, neuroanatomy, and brain dissections in this room – and then in the afternoon, when our standardized patients come in, we wind up doing the physical exam at the same tables. So I would like to see a lot of that money go toward facilities for teaching.

Kofke: You've talked about facilities, and Penn is going to create a great new clinical simulation center where health-care providers can practice the latest techniques in surgery, emergency medicine, labor and delivery, and other specialties. So let's talk about teaching using a simulator. [Kofke was the founding medical director of the Measey Simulation Suite.] It takes forever to develop a scenario and actually run a session, and then run the whole medical

school through it, four at a time. That's expensive. Facilities are important, but the people to support them are more important for the success of the facilities, programs, and students into the future.

Vonderheide: Endowed professorships are critical. Salaries are a huge part of the research effort. If you don't have support for the salaries of your researchers, then you have a crisis on your hands because you can't make a commitment to your people and you can't hire the people you need. So endowed professorships take that pressure off, triggering freedom to think more creatively and to carry out better research.



Madara: I think the greatest value at PENN Med is its people. You've got three and four generations of families coming in and working at the hospitals, all with the purpose of supporting the patient. It's an amazing thing to watch.

I feel the same way today at Penn as I did when I was treated here more than 20 years ago. I've had a great experience with all areas of medicine that I've been involved in and wonderful opportunities to volunteer. Last and far from least, I enjoy seeing education and research taking place right alongside patient care.

I hope the campaign will help increase public awareness of what is available here – the cutting-edge medicine that other places don't have – and what is being done to improve it and make it better for patients, like the Perelman Center. ♥

Nancy Hendrie with Vuthea Tep, an orphan then in 8th grade. He calls her "my best grandma in the world."



THE PRINCIPLE OF

SHARING



The Sharing Foundation's Khmer literacy school serves more than 135 children a day.

Whether in Massachusetts or in Cambodia, Nancy Woodward Hendrie, M.D. '58, has cared for patients and the less fortunate – not always without a struggle.

By Elizabeth Eidlitz



It was a challenging era for the eight women admitted to Penn's School of Medicine in 1954. Back then, men were assigned to Penn housing, but women were handed a mimeographed list of local homeowners who would take roomers and told to find a place to live. On campus, they were allowed the use of one small bathroom near the Anatomy Building as well as the librarian's bathroom, with permission from Miss Frances Houston.

On her first day of classes, Nancy Woodward Hendrie ('58), approached Vardy Buckalew, Charlie Hassell, and Bill Miller, the other members of the gross anatomy group to which she'd been assigned. Although she and the three Southerners eventually became good friends, their initial response to the prospect of sharing a cadaver with a female and a Yankee was not untypical: "Oh, no – we got one of *them!*"

Even four years later, lining up for graduation and wearing maternity clothes for the first time, Hendrie recalls being pushed against a wall by a professor of internal medicine, who told her, "That's why we never should have let you in in the first place."

Today, as she approaches her 50th reunion, Hendrie feels that such experiences toughened her for the future. And she looks back fondly on her "very high-quality medical education" from professors like Roy Williams, Francis Wood, and Lewis Barness, who she says were personally interested in students and knew how to impart information.

"I'll never forget scrubbing in and standing next to the iconoclastic Dr. I. S. Ravdin, who'd told a resident to move to the foot," says Hendrie. "My trembling hands barely managed to hold a retractor firmly." She also remembers the preceptor in pediatric cardiology at The Children's Hospital that she had in her junior year. He told her: "It's not the most brilliant physician who does the best for his patients, but the most conscientious." It was a lesson she lived by throughout her pediatric practice.

"Most importantly," says Hendrie, "Penn introduced me not to specific answers, but to a way of thinking," a problem-solving process. She needed it when she finished an internship at Lankenau Hospital in Philadelphia and moved to Boston with her two little boys and husband, Gardner C. Hendrie, a computer engineer with an M.S. degree in physics from Penn.

In 1961, no women with young chil-

dren were allowed into first-class residency pediatric programs. Hendrie was turned down repeatedly by major Boston hospitals. "The idea of a half-time residency in ambulatory pediatrics that I yearned for while my children were young was considered scandalous. At Boston Children's, I was rejected by the distinguished Dr. R. Cannon Ely, who said, 'If you were the Virgin Mary, maybe we would consider you, but, obviously, you aren't.'"

In early 1960, Hendrie read that the new Radcliffe Institute for Independent Study was enabling women with Ph.D. degrees or the equivalent and who were homebound, usually with young families, to go forward in their chosen fields. She wrote to the president of Radcliffe College, Mary I. Bunting, and asked whether the people who created the Institute had considered helping women doctors who were stalled in the same way. She soon had her answer. She received a Bunting Fellowship for 1961-2 and then for 1963-4, becoming the first half-time resident at Boston Children's Hospital. After working in the outpatient clinics and emergency room three full days a week



At the self-sustaining sewing school, village girls learn to sew by making school uniforms, which are donated to needy children throughout Cambodia.

for two and a half years, she was granted one full-year residency credit. She then went on to complete the required inpatient residency year and became board-certified in pediatrics in 1969.

According to Hendrie, her medical career began at age nine when she set up a doll hospital in the sunroom of her home in Hanover, New Hampshire. It developed into 30 years of pediatric practice in Massachusetts and led to her election as the first female president of the medical staff of Emerson Hospital in Concord. Her career could have ended when Hendrie closed her office in 1994, having endured and prevailed despite skeptics. But instead of relaxing on a cruise ship or baking brownies for five grandchildren, she chose not to put away her stethoscope or stop examining babies. What she did was bring her skills and experience to Asia. Her first stop was China, where she assisted with American family adoptions by evaluating children and providing on-site medical care. Along with Laurie C. Miller, M.D., she eventually published some of her observations of the health of these children adopted from China in *Pediatrics*, the journal of the American Academy of Pediatrics (2000).

Hendrie then visited Cambodia, a significantly poorer nation. It was there that she decided that helping the thousands of children growing up with bleak futures was more important than assisting the relatively few children on their way to the U.S. as adoptees. In 1998, Hendrie established The Sharing Foundation to improve conditions for Cambodian children, an estimated 45,000 of whom die each year from preventable starvation and treatable diseases. Ten years later, the Foundation's initiatives serve more than 1,500 children every day.

According to Hendrie, American doctors today, who routinely make use of high-tech diagnostic tools, are often in-

undated by paperwork and confined by HMO regulations. In contrast, she points out, "In Cambodia, where sophisticated technology is unknown, someone trained in the '50s to use hands, eyes, and a stethoscope can practice high-quality medicine."

One of the Foundation's projects, Ro-teang Orphanage, represents a new standard for hygiene, medical services, nutrition, and compassionate care. Because the orphanage accepts children regardless of their medical condition, nearly half of the 65 infants and children who are admitted have HIV/AIDS, cerebral palsy, TB, syphilis, Hepatitis-B, or congenital anomalies. Many will remain in the care of the Foundation permanently.

The orphanage overturns the traditional model of rotating caregivers. Instead, permanent nannies are assigned as mother substitutes – one for every two children – and the nannies are exclusively in charge of their care. Citing some recent studies in the field, the Foundation believes that a stable bond of that sort fulfills the children's need for attachment. Says Hendrie, "It's the only arrangement that makes sense."

The original focus of the Foundation has widened to include educational and vocational training and the provision of safe water. It also seeks to provide medical treatment abroad when necessary. The Foundation has built and supports five schools, in addition to a library and a playground. "I'm most proud of the fact that three years ago, 10 village students sponsored by TSF through high school were accepted by handpicked universities in Phnom Penh," says Hendrie. "None of their parents or siblings had been educated beyond 9th grade." Now, Hendrie reports, a new set of 10 has joined the sophomores and juniors for university educations fully sponsored by the Foundation.

The Sharing Foundation's cooperative farming project, with an on-site Khmer



Pre-schooler Chan Piseth gives the customary Cambodian greeting.

literacy school, is similar to Head Start. It pays about 50 illiterate, indigent parents \$2.00 a day – the equivalent of a laborer's wage in a country where \$15.00 clothes a family of four and a new home can be built for \$600.

As Hendrie explains, the American dollar goes very far in Cambodia: The cost of two pepperoni pizza slices purchases a school uniform, required at public schools. In the United States, which she calls "a fabulous land of too much," the cost of Wal-Mart's "dancing Santa" (\$39.95) buys full immunization coverage for two children who would otherwise see no such protection.

The Sharing Foundation differs from many other worthwhile charities in two major respects: strict financial accountability and the personal involvement of the founder. Of every dollar contributed to the 501(c)(3) non-profit, non-governmental organization, 91 cents goes into Sharing Foundation programs. Neither Hendrie nor any other American is paid. Every board member has pledged to support The Sharing Foundation Capital Campaign financially. Funding for an annual \$300,000 budget comes chiefly from individual donors; some additional

support comes from small fundraising events and interest generated by the website, www.sharingfoundation.org, and the quarterly newsletter.

Dedicated volunteers raise funds and locate needed materials in the U.S.; some volunteers travel to help in Cambodia. At Roteang Orphanage, an East Coast family of five constructed a playground, funded by a Lutheran church school in Florida. A long-time Montessori teacher from Massachusetts and her daughter, a graduate student, made three mentoring trips to the Foundation's preschool. Two college professors from Seattle who teach English as a second language spent four weeks training bilingual teachers at The Foundation's English school.

Fred Watson of New Hampshire decided to visit Phnom Penh and Roteang after discovering that two-thirds of his donations to support children in Viet Nam through another organization based in the United States were used to pay administrative and fund-raising costs.

"What I saw really amazed me," says Watson. "Dr. Hendrie's various undertakings should be a model for running an NGO. True, Nancy is an autocrat, but her constant attention to detail and economy

is her secret to success, especially in a country noted for corruption and waste."

Now 75 years old, Hendrie monitors The Sharing Foundation not from an air-conditioned office suite but on the site. Despite dust, monsoons, heat, and humidity, she has flown to Cambodia every three months, more than 40 times, to oversee the projects; to review, line by line, the monthly expense reports submitted by every program manager; and to work with Chan Kim Leng (known as "Elephant"), her in-country director.

Occasionally, Hendrie has brought severely compromised infants to Boston for surgery. Always, she returns to Cambodia with three 70-pound suitcases filled with sewing school crafts. In Concord, she packs her slide projector and travels to speak about underserved Cambodians whenever and wherever invited. She consults daily with Chan Kim Leng, who oversees the operations of 16 Foundation projects.

"Dr. Nancy taught me to review staff," he explains. "If they are not honest, they will be out of the programs. I keep eyes on the project." A former taxi driver who grew up in a jungle town where there were no roads or electricity, he says he is proud of his position – and very happy that his own children are now able to go to school.

Despite the responsibilities she has taken on, Hendrie is not ambivalent about what she does. "The passion that is killing me is keeping me alive," she says.

Hendrie has been a role model, not only for women determined to combine

a career with marriage and family, but for senior citizens. She has no patience with people like the woman who once told her, "Oh, I don't know why you work so hard. What I like to do is nothing. Maybe sit on a Florida beach."

Hendrie's work and passion have been recognized, most notably when she was awarded an honorary Doctor of Science degree for Humanitarian Service during Mt. Holyoke College's 2003 commencement. The college's president, Joanne Creighton, said: "There are those who watch and those who do. Nancy Woodward Hendrie, Class of 1954, what you have done stands as testimony to the power of resourcefulness, dedication, and compassion. At a point in life when many look inward, you are reaching out and changing a corner of the world, leaving a legacy of health and hope where before there was none."

Later that same year, Hendrie received an Angel in Adoption award from the Congressional Coalition on Adoption Institute. She was nominated by her U.S. Representative for her work in Cambodia. Part of the citation reads: "She has truly been an angel for countless children." Hendrie has also been honored by the Middlesex Central District of the Massachusetts Medical Society as a Community Clinician of the Year.

Meanwhile, Hendrie and the rest of the Foundation's board are continuing to build an endowment to ensure that its cornerstone initiatives are sustained.

"Unlike many other NGOs here," Hendrie states emphatically, "The Sharing Foundation will not be guilty of starting projects in a developing country, raising hopes, and then abandoning them." According to Hendrie, the board is almost halfway to its goal. "But I can't turn up my toes until the endowment reaches \$3 million."

Hendrie's advice to the 2003 graduating class of Mt. Holyoke was entirely in character: "Make your life stand for something." ♥



Owens House in Phnom Penh was The Sharing Foundation's first effort to intervene for children at risk for HIV/AIDS, by preventing mother-to-child transmission of HIV.

MM

Measuring the Unseeable:

Penn Researchers Probe the “Dark Energy” of Proteins

By Karen Kreeger

Researchers at the School of Medicine became the first to observe and measure the motion *inside* proteins – their ‘dark energy.’ This research, published last summer in *Nature*, revealed how the internal motion of proteins affects their function and overturns the standard view of protein structure-function relationships. Their discovery also suggests why “rational” drug design has been so difficult.

“The situation is akin to the discussion in astrophysics in which theoreticians predict that there is dark matter, or energy, that no one has yet seen,” says A. Joshua Wand, Ph.D. ’84, the Benjamin Rush Professor of Biochemistry and Biophysics. As Wand, senior author of the study, puts it, “Biological theoreticians have been kicking around the idea that proteins have energy represented by internal motion, but no one can see it. We figured out how to

see it and have begun to quantify the so-called dark energy of proteins.”

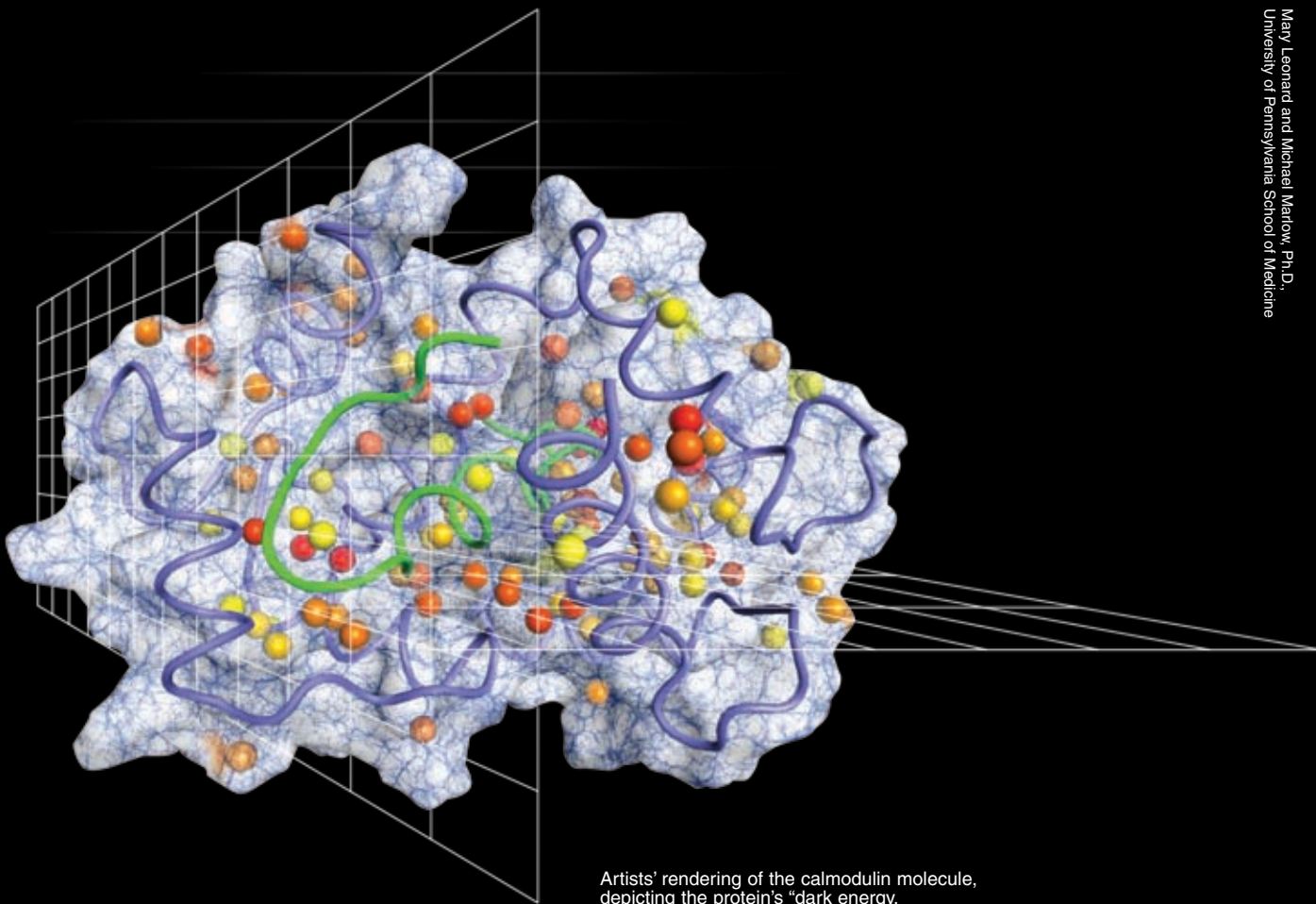
Proteins are malleable in shape and internal structure, which enables them to twist and turn to bind with other proteins. “The motions that we are looking at are very small but very fast, on the time scale of billions of movements per second,” explains Wand. “Proteins just twitch and shake.” The internal motion represents a type of energy called entropy.

The current models of the structure and function of proteins that are used in research and drug design often fail to account for their non-static nature. According to Wand, “The traditional model is almost a composite of all the different conformations a protein could take.”

Using a protein called calmodulin, the researchers measured its interactions with six other proteins when bound to a protein partner one at a time. These

binding partners included proteins that are important in the contraction of smooth muscle and a variety of brain functions.

Using nuclear magnetic resonance spectroscopy, the investigators were able to look at the changes in the internal motion of calmodulin in each of the six different protein-binding situations. They found a direct correlation between a change in calmodulin’s entropy – a component of its stored energy – and the total entropy change leading to the formation of the calmodulin-protein complex. Finding out the contribution from individual proteins versus the entropy, or movement, of the entire protein complex has been more difficult, but the researchers were successful in this study. From this individual contribution, the researchers deduced that changes in the entropy of the protein are indeed im-



Artists' rendering of the calmodulin molecule, depicting the protein's "dark energy."

portant to the process when calmodulin binds to its partners.

"Before these unexpected results, most researchers in our field would have predicted that entropy's contribution to protein-protein interactions would be zero or negligible," says Wand. "But now it's clearly an important component of the total energy in protein binding."

Implications for Drug Design

Because of this new information, the researchers suggest that the entropy component may explain why drug design fails more often than it works. At present, drugs are designed generally based on the precise structures of their biological targets, which are active regions on proteins that are intended to inhibit key molecules. However, the number of designed molecules that actually bind to their targets is low for many engineered

molecules. "We think that this is because the design is based on a model of a static protein, not the moving, hyper protein that is constantly changing shape," says Wand. "We need to figure out how this new information fits in, and perhaps drug design could be significantly improved."

Erik Zuiderweg, a biophysicist at the University of Michigan who was not involved in the Penn study, emphasized the importance of the discovery to *The Philadelphia Inquirer*: "If we want to revive drug design in pharmaceutical industries or universities, there has to be a new realization of this in the design process." Zuiderweg, who used to work on drug discovery for Abbott Laboratories, added that "rational drug design" has largely failed at this point.

One of the future directions for Wand and associates is trying to understand

whether the principles revealed by this study are universal – and therefore affect the thousands of interactions between proteins that underlie biology and disease. As Wand explains, "Protein-protein interactions are central to 'signaling,' which is often the molecular origin of diseases." He cites cancer, diabetes, and asthma as three important examples. "We are currently looking at the role of protein entropy in the control of critical signaling events in all three." Michael S. Marlow, a postdoctoral fellow in Wand's lab and one of the coauthors of the *Nature* article, told the *Inquirer* that, so far, "we've found the correlation is consistent for other proteins."

The work by Wand's Penn team – which also included Kendra King Frederick and Kathleen G. Valentine – was funded by grants from the National Institute of Diabetes and Digestive and Kidney Diseases. ▀

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Saturday, May 17th

- ◆ Panel discussion by Dr. Arthur Caplan, renowned bioethicist
- ◆ Picnic and Parade of Classes
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SN ZING

WORMS

By Karen Kreeger

C. ELEGANS HELPS PENN RESEARCHERS EXPLAIN THE EVOLUTION OF SLEEP

The roundworm *Caenorhabditis elegans*, long a staple of laboratory research, may play an important role in unlocking one of the central biological mysteries: why we sleep. Researchers at the School of Medicine reported in an advanced online edition of *Nature* (January 9, 2008) that the roundworm has a sleep-like state. That trait makes it similar to most of the animal kingdom. The research has implications for explaining the evolution and purpose of sleep and sleep-like states in animals.

In addition, genetic work associated with the study provides new prospects for the use of *C. elegans* to identify genes that regulate sleep and drug targets for sleep disorders.

David M. Raizen, M.D., Ph.D., assistant professor of neurology, is the first author of the report. With other researchers at Penn's Center for Sleep and Respiratory Neurobiology, Raizen showed that there is a period of behavioral quiescence during the worm's development called lethargus that has sleep-like properties. "Just as humans are less responsive during sleep, so is the worm during lethargus," explains Raizen. "And, just as humans fall asleep faster and sleep deeper following sleep deprivation, so does the worm."

By demonstrating that worms sleep, Raizen and colleagues not only have demonstrated the ubiquity of sleep in nature, but also proposed a compelling hypothesis for the purpose for sleep.

Lethargus, they found, coincides with a time in the roundworms' life cycle when synaptic changes occur in the nervous system. With that clue, the Penn investigators also propose that sleep is a state required for the nervous system to gain plastic-



John Overmyer

ity. In other words, for the nervous system to grow and change, there must be down time without active behavior. Other researchers at Penn have shown that, in mammals, synaptic changes occur during sleep and that deprivation of sleep results in a disruption of these synaptic changes.

The discovery of the worm's snooze time also inspired the research team to use it as a model system for identifying a gene that regulates sleep. This gene, which encodes a protein kinase and is regulated by a small molecule called cyclic GMP, has been previously studied. Until now, however, researchers did not suspect that it may play a role in sleep regulation. The findings suggest a potential role for this gene in regulating human sleep. It may also provide an avenue for developing new drugs for sleep disorders.

The new research "opens up an entire new line of inquiry into the functions of sleep," notes Allan I. Pack, M.B., Ch.B., Ph.D., director of the Center for Sleep and Respiratory Neurobiology and co-author of the study. ♥

Jun Mao, M.D., performs acupuncture, observed by Erica Mitchell, left, a second-year student, and Mously Almoza, a fourth-year student. Almoza took the elective in China with Dr. Mao.



Daniel Burke

Learning

ACUPU

PENN PROFESSOR ORGANIZES

Acupuncture has been a part of Chinese medicine for more than 5,000 years. What better place to learn about this ancient medical treatment than where it originated?

That was the impetus for an acupuncture elective that Jun J. Mao, M.D., M.S.C.E., an assistant professor in the Department of Family Medicine and Community Health, helped create for medical students. Mao had gone to China as a fourth-year medical student, he says, “and the experience was transformational. Learning about acupuncture and Chinese medicine helped me become a better doctor.” Back in the United States, Mao continues, “I wanted to share that passion with other medical students.”

For his acupuncture elective, Mao attended the China Beijing Acupuncture Training Center. The World Health Organization created the center in 1976 to educate international health professionals in the use of acupuncture. “I told other students about my experiences, but it was very difficult for them to make contact, because of language barriers and bureaucracy.”

So Mao formed a company – Acupuncture Education International, Inc. – specifically to help other medical students take advantage of this unusual experience. Working with Chinese physicians and educators, he developed a curriculum for

American students that focused on case-based learning with plenty of hands-on experience. In 2002 he brought over his first group of medical students.

Since then, the program has flourished. “So far, 176 students from over 53 institutions have participated – including nine students from PENN Med,” Mao reports. “I believe it’s the largest program of its kind.” Mao notes that Penn’s Global Health Programs, which helps fund overseas electives for Penn students, has also contributed to his program.

Today, groups of 15-20 medical students participate annually: first-year students in July and fourth-year students in April. Jeremy Brauer, who earned his medical degree from Penn last year, took the elective this past April. Currently a dermatology intern at Lenox Hill Hospital in New York, Brauer had a clinical research fellowship with the Doris Duke Charitable Foundation while he was at Penn and received the John Glick Prize for Translational Cancer Research last year. “I’ve had an interest in complementary and alternative medicine since high school,” he says. “And I worked with Dr. Mao on a project investigating the use of CAM in dermatology. I saw this as a once-in-a-lifetime opportunity.”

The fourth-year students go over as a group on their own. Mao accompanies

the first-year students in July. “That’s how I spend my summer vacation,” he says with a smile.

Learning from Scratch

The four-week acupuncture elective takes students from basic theories to actual practice. During the first week, students are introduced to the basic theories of acupuncture and traditional Chinese medicine. Over the remaining three weeks, they shadow acupuncturists in groups of three or four students. “They do actual needling and cupping,” explains Mao, referring to a type of pain release in which the practitioner places heated cups over a painful area. The students also learn about herbs; Tai Chi, a form of mind-body exercise; Qing Gong, an energy therapy; the basic principles of Yin-Yang; and Tui Na, a type of massage based on the same meridian systems as acupuncture.

Brauer admits, “It was initially difficult to understand all of the interrelationships between organs, elements, seasons, and even emotions.”

According to Mao, “The course is a challenge for students because they are so ingrained in the biomedical perspective, but it makes them think more critically about medicine over all.” Although the students are exposed to the traditional

NCTURE

from the Experts

ELECTIVE IN CHINA

By Sally Sapega

Chinese medicine, they are not required to practice in that context. “I have to say often the students are fairly skeptical of the [traditional Chinese medicine] theory; however, the exposure does challenge them to view medicine from another perspective.” And because the traditional theory is so embedded in the Chinese culture, “that exposure allowed students to gain some cultural perspective of the clinical medicine.” The outcome, Mao says, is “they become more well-rounded physicians.” Mao, who earned his master’s degree in clinical epidemiology from Penn



Jeremy Brauer, M.D. '07, shown taking part in the elective, helps mix traditional Chinese medical components for a prescription.

in 2006, is lead author of an article published last January in *Family Medicine*, “A Gain in Cultural Competence Through an International Acupuncture Elective.”

Almost all of the lectures were in the native Mandarin tongue. Fortunately, says Brauer, “we had wonderful translators who were always willing to clarify points for us. One of my favorite moments of the elective was when we visited the hospital pharmacy. There were drawers, wall-to-wall, housing everything from dried tortoise shell and wolfberries [which Brauer was told are good for the liver] to powdered zinc and ginger root.”

Students have the opportunity to practice acupuncture under the supervision of Chinese acupuncturists. In addition, they can experience acupuncture as patients if they have appropriate medical problems, such as back pain.

“It was fascinating to converse with these patients – with the help of our translators – and learn of their deep traditional cultural beliefs,” says Brauer. “But it was just as interesting to learn that most of the younger generation in China prefer to initially seek out Western-style therapies.”

Brauer notes that he intends to continue his education in complementary and alternative medicine. “I plan on using what I have learned both in my future practice and in research.”

One of the motivations for Mao is “to give students a realistic sense of what CAM can provide. I grew up in China, so I see my life as a bridge between traditional Chinese medicine and biomedicine.” And he sees a trend from alternative toward complementary. An article in *Archives of Internal Medicine* (September 24, 2007) by German researchers appears to provide some evidence for Mao’s



Daniel Burke

ACUPUNCTURE: THE TRADITIONAL VIEW

The ancient Chinese believed that a universal life energy – called Chi or Qi – circulates throughout the body along specific pathways or meridians. As long as this energy flows freely, health is maintained, but once the flow of energy is blocked, the system is disrupted and pain and illness occur.

According to the theory, inserting acupuncture’s very fine needles on specific points of the body stimulates points on the meridian to free the Chi energy and restore health.

view: they report that both traditional Chinese and “sham” acupuncture (defined as “superficial needling at nonacupuncture points”) is more effective at alleviating chronic lower back pain than physical therapy, pain medications, and other typical Western treatments. “In the future,” says Mao, complementary medicine “will be integrated as part of the treatment plan.” ♥

Biomedical Postdoctoral Programs

is an international model for how to train – and treat – postdoctoral researchers.

By Thomas W. Durso



Yvonne Paterson, Ph.D., meets with Patrick Guirnalda, Ph.D., a postdoctoral trainee.



Resource for Postdocs

Photographs by Tommy Leonardi

Late one Friday afternoon a few years back, Mary Anne Timmins of the School of Medicine's office of Biomedical Postdoctoral Programs was finishing up with her weekly duties and preparing for the weekend when a postdoctoral student ducked in for a chat.

The young scholar had a job interview coming up and was stopping by to seek Timmins's advice on what to wear.

The interview was on Monday.

Not only did the postdoc not own a necktie, he didn't know how to knot one, either.

"Postdocs have been in a lab since their undergraduate days," explains Timmins the office's director of administration.

"Some graduate students are doing more than five years of postdoctoral research training. You combine all of those years of life in a laboratory and you realize that postdocs may not have the skills they need to succeed in a different process."

Career development, professional training, a clearinghouse for postdocs to seek assistance on an array of personal and professional issues: Timmins's story (which, by the way, ended with the successful procurement of a suit and necktie, and the imparting of instructions on how to tie the latter) nicely illustrates the range of assistance BPP has provided over the last decade. Considering its

comprehensive training programs and the trailblazing policies the office has instituted, you begin to understand how Penn has developed into an international model for how to train postdoctoral researchers in the life sciences and to treat them with respect and equality.

Before the office's founding, there were 17 classifications for postdocs in the School of Medicine, and faculty members were on their own in determining how to appoint and pay them, how long to keep them on, how to work through grievances, and how to provide vacations, leaves, and insurance. Such issues were becoming flashpoints on campuses across the country, as postdocs were growing restive at what they perceived as unfair treatment and universities unsure of how to deal with the anger of such an essential population within their research enterprises.

"There were no policies governing these issues before 1997, which meant postdocs could be easily abused," says Yvonne Paterson, Ph.D., director of BPP. A professor of microbiology, she also serves as associate dean for postdoctoral research training and director of biomedical postdoctoral programs. "Our aim was to protect them and make certain we had policies in place to treat them in an egalitarian and fair manner."

The outcome was that, for the first time, the University Council Committee on Research compiled and published an institution-wide policy for postdoctoral fellows. First of all, it defined postdocs as trainees rather than employees, then delved into such matters as the appointment and grievance processes, stipend levels, insurance, and training.

"In recognizing that they're not employees but trainees, you cast a completely different perspective on what our obligations

to them are,” says Glen N. Gaulton, Ph.D., executive vice dean and chief scientific officer of the School of Medicine. “We do have obligations to these fellows, and this is to ensure they have the best training experience possible and reach their maximum potential as researchers.”

Realizing that infrastructure was needed to enforce the new policies, the School of Medicine committed financial resources to staffing the initiative and established the Office of Postdoctoral Programs. After a few successful years, the office began to welcome postdocs from the schools of Veterinary Medicine and Dental Medicine, the Howard Hughes Medical Institute, The Children’s Hospital of Philadelphia, and the Monell Chemical Senses Center. To reflect its broader constituency, it was rechristened Biomedical Postdoctoral Programs.

“When we established the Office of Postdoctoral Programs, there was only one other similar institution in the country, but they were nowhere near as far as we were in terms of their forward thinking,” says Trevor M. Penning, Ph.D., the founding director of the office and a professor of pharmacology, obstetrics and gynecology, and biochemistry and biophysics. “By default we have earned the reputation as being the model for how an office should be run for education, training, and support.”

BPP now serves close to a thousand postdocs. In addition to setting equitable

policies and training fellows in such research-related necessities as grant writing and research skills, the office provides programming in business etiquette, networking, and other fields related to career development and advancement. As Timmins notes, there simply aren’t enough tenure-track assistant professorships for every postdoc to step into, so the office also publicizes the options available outside academe.

According to Penning, beyond having the infrastructure in place, “The office historically has taken the lead in professional development programs for postdocs so there is value added to their training. They’re not just at that bench doing their experiments. They’re being taught professional skills that will enable them to move to the next step.”

Stacy L. Gelhaus, Ph.D., a postdoctoral researcher in the Center for Cancer Pharmacology, cochairs Penn’s Biomedical Postdoctoral Council, which acts as a liaison between postdoctoral students and both BPP and its faculty advisory board. She notes that the wide variety of the office’s personal and professional training programs is an enormous benefit to fellows and their mentors.

“This is very advantageous to P.I.s because, more and more, the N.I.H. is requesting training components for all grants,” says Gelhaus. “And one of the goals of the program office is to expose postdocs to alternative careers -- in other words, what else can you do with a Ph.D.?

NIH funding is tight, and it is very competitive to get a faculty position anywhere these days, so the program office brings in speakers and panels from pharma, patent offices, consulting firms, and so on. All of this is very helpful and provides great networking opportunities.”

In her two years as director of the BPP, Yvonne Paterson has set her sights on the issue of diversifying the postdoctoral population, an initiative that she hopes will bring more underrepresented minorities into the ranks of the full-time faculty. The office’s first grant in this initiative was a \$4.2 million N.I.H. award for postdoctoral teaching fellowships. BPP is using the funds to support postdocs who teach at local minority undergraduate institutions, in hopes of providing positive role models to inspire minorities to seek Ph.D. degrees in the sciences. In addition, the office has hired a diversity and recruitment coordinator.

As Paterson puts it, “The dean and the president and others have expressed concern about the lack of diversity in the academy. . . . Less than four percent of our postdoc body are under-represented minorities. To get a position in the biomedical faculty, you need to have done a postdoc, and if less than four percent of our postdoc body are black or Latino, that results in a big break in the pipeline to the faculty.”

That pipeline is essential for the entire research enterprise. Whether the issue is neckwear, grant-writing, or family leave, BPP in its decade of service has helped to create an environment in which these vital trainees can flourish and thrive.

“Postdoc trainees are the backbone of the modern research laboratory,” says Paterson. “Our objectives at BPP are to serve the University’s research endeavor by providing a rich postdoctoral training environment outside the laboratory.” Such training, she says, “helps faculty to recruit and retain first-rate postdoctoral fellows, who will become the next generation of research scientists.” ♥

Dr. Paterson with staff: (left to right) LaShauna Myers, recruitment and diversity coordinator; Mary Anne Timmins, administrative director; Kryste Ferguson, academic coordinator; and Jorge Santana, business coordinator.





Development Matters A Vision for Red

One evening in October, civic, University, and PENN Medicine leaders, as well as faculty members, volunteers, and philanthropists, gathered in the Biomedical Research Building for a celebration. All are united to support a grand undertaking: PENN Medicine’s largest fund-raising campaign yet – and a vital part of the University’s recently announced \$3.5 million “Making History: A Campaign for Penn.”

Over the next five years, PENN Medicine plans to raise \$1 billion to propel medical discovery, promote health in the Philadelphia region and beyond, create knowledge by establishing new professorships, and prepare

David L. Cohen, Esq.

*Chair, PENN Medicine Board of Trustees
Chair Elect, Greater Philadelphia Chamber of Commerce*

This campaign is coinciding with a time of great opportunity for the city. A special energy and excitement usually attends a change of leadership in City Hall. We feel it, and we fully intend to pursue new opportunities for new alliances at every level during the life of this campaign and beyond.

The invitations for the University’s campaign event carried the phrase “The Time Is Now, the Place Is Penn.” I would like to expand on that thought by adding, “and the City is Philadelphia.”

Penn has entered a new phase of building that is generating new jobs for local residents and new private investment in West Philadelphia and along the Schuylkill River. At the same time, Penn is using its considerable purchasing and construction capacity, as well as its academic expertise, to encourage local business growth, empower minority and women business owners, provide women and minorities with greater access to the skilled and higher-paying trades, and create jobs.

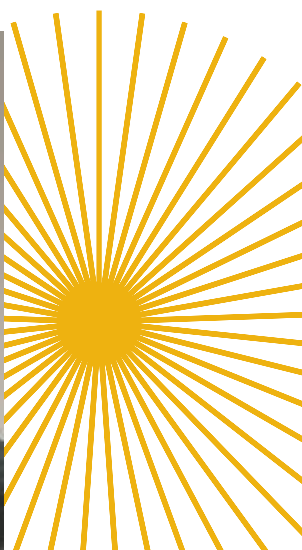
But Penn Connects, our unprecedented campus expansion plan, is only one part of the University’s com-

mitment to the community and the City of Philadelphia. This commitment has long been part of the Penn Compact – its goal, to collaborate with local communities on many bold initiatives to improve public education, public health, economic development, employment opportunities, the quality of life, and the physical landscape of West Philadelphia and the rest of the city. It’s a goal to promote sustainable and equitable economic growth throughout the region. Aligned in this effort are the brightest minds, the most capable and inspired leaders, the most committed alumni and volunteers, and the most generous donors.

So, we’re living in a terrific time for PENN Medicine and for Philadelphia. We have a wonderful leadership team. We have a world-class faculty and physicians. We have a robust development program. All the pieces are in place for us to enjoy heady success. The years ahead will be thrilling ones, for Penn and for Philadelphia.

MAKING HISTORY
THE CAMPAIGN FOR PENN

**PENN
Medicine**



Refining Medicine

the physician-researcher leaders of tomorrow. PENN Medicine aims to do nothing less than shape the future of medicine, transform lives, and make history.

The evening's message was about vision: how the campaign for PENN Medicine will enable physicians, researchers, and students to focus efforts on the most pressing medical challenges of our time. How will this campaign affect lives at Penn and beyond? Each of PENN Medicine's leaders offered an answer.

Amy Gutmann, Ph.D.

President, University of Pennsylvania

The Penn community and I take enormous pride in PENN Medicine and its ability to change lives for the better. We are proud of our high-ranking medical school, the first in the nation; our outstanding medical research that has generated a host of biomedical firsts; and our three hospitals that provide superb care to 75,000 inpatients and more than two million outpatients each year.

Because we are Penn, we are always pursuing opportunities to achieve new heights. By seizing this moment to launch our campaign, we are about to show the world what a preeminent academic medical center can really do!

PENN Medicine's prescription for a sounder, healthier world parallels three principles guiding our great University's vision. PENN Medicine is dedicated to the democratic ideal of increasing access, both in providing an outstanding biomedical education and superior medical care. PENN Medicine is consummately collaborative. And PENN Medicine engages across the world. So it is exciting to contemplate the huge impact that The Campaign for Penn will have on our world – beginning with our neighborhood, city, and region.

A very prominent example is the world-class medical complex we are currently building that will revolutionize cancer and cardiac care while supporting the next generation of biomedical research. The complex will include the Perelman Center for Advanced Medicine, set to open in 2008; the Roberts Proton Therapy Center, which will be the largest in the world when it opens in 2009; and a biomedical research tower, which will open in 2010.

As these magnificent buildings come on line, we will be transforming 24 stagnant industrial acres into a lively 24/7, mixed-use neighborhood that connects Penn and our great medical campus more seamlessly to Center City. This neighborhood will feature parks, a vibrant mix of theaters, shops, restaurants, and apartment buildings, and urban boardwalks. It is a vital part of our 30-year campus development plan, Penn Connects: A Vision for the Future. It will become part of the ultimate urban campus, a physical manifestation of the connections and bonds of knowledge that will allow Penn to change the world.

All in all, this is a thrilling time for PENN Medicine. This is a campaign to make Penn an ever more extraordinary force for good, here at home and around the world.

Photographs by Stuart Watson (except for David L. Cohen)

For the campaign kickoff, the Biomedical Research Building was festooned with the Penn colors. In the auditorium, guests heard speakers like David Cohen, far left, and President Amy Gutmann. They also watched campaign videos, like this one, far right, in which Michael Parmacek, M.D., discusses opportunities in cardiology.





Arthur H. Rubenstein, M.B., B.Ch.

*Executive Vice President of the University of Pennsylvania for the Health System
Dean, University of Pennsylvania School of Medicine*

Our goal for PENN Medicine is bold. Simply stated, our campaign seeks to make PENN Medicine a global leader for the next century in medical education, research, and care.

But this goal is not just about PENN Medicine. Our campaign materials say that “A Healthier World Awaits” and that “We Are Medicine.” These are powerful phrases and powerful claims that express our belief that we can change the world for the better. Our goals and ideas truly are at that life-changing level.

A billion dollars: That’s an impressive figure. Some might use the word *daunting*. But boldness is part of Penn’s way. It is our boldness that has inspired fellow visionaries like our donors and volunteers to partner with us in our journey of discovery and achievement.

We know we will succeed in our vision for PENN Medicine because our aspirations are your aspirations. And we have many examples of great things happening here when the aspirations of philanthropists match up with great ideas.

Building the most incredible environment for patients and the most collaborative space for our researchers and staff? Raymond and Ruth Perelman.

Bringing the most miraculous radiation technology to the tri-state region and creating the world’s most comprehensive radiation treatment facility? Ralph and Suzanne and Brian and Aileen Roberts.

Fighting complex diseases like diabetes and Alzheimer’s with integrated, comprehensive approaches? The Ware Family.

Making sure the best minds come to Penn? Walter and Anne Gamble, Henry and Barrie Jordan, and the Measey Foundation.

Combining world-class cancer research with individualized, compassionate cancer care? Leonard and Madlyn Abramson.

Who will join their ranks in the years ahead? What

passionate people will make more revolutionary ideas reality? There is no shortage of great ideas to pursue. Let us begin.

Ralph W. Muller

CEO, University of Pennsylvania Health System

PENN Medicine is one of the great institutions of the world. A lot of people would like to be able to say that. We can, and we hold ourselves accountable for performing at that level every day.

I’ve spoken with many people about this campaign in the last year. Some have known Penn for decades – as patients, volunteers, and friends. They’ve all told me the same thing: They have never felt more excited about our future.

That feeling of excitement extends to the people we’ve recruited to Penn. The stellar academic leaders who have joined us are a whole breed apart. This includes the remarkable people who have joined our Board of Trustees over the last few years. Any undertaking as ambitious as this one needs a strong, clear vision and the strength of purpose to make it happen. Our trustees possess these qualities in abundance.

What we will have at the end of this campaign is a whole new medical campus, one engineered to provide the best and most comfortable care to patients and bring out the best in collaborative teams of medical specialists and physician-scientists. Can you imagine what we will be able to achieve when our facilities are as extraordinary as our people?

Clearly, we begin this campaign from a position of tremendous strength. There are great days ahead for PENN Medicine and everyone touched by the tremendous work that goes on here. We will prove, time and time again, that “We Are Medicine.”

Henry A. Jordan, M.D. '62, G.M.E. '67

Chair, PENN Medicine Campaign Cabinet

I would like to quote something said by Glen Gaulton, our executive vice dean and chief scientific



Working closely with Dean Arthur Rubenstein, far left, and CEO Ralph Muller, Henry Jordan, M.D. '62, will play an important role as chair of the PENN Medicine campaign. As Jordan puts it, "I have never seen a time of such progress and potential in medicine."

officer. He said: "What could bring you more joy than to contribute to individuals who are as passionate as you are about a particular disease, who have dedicated their lives to helping cure that disease."

I think Glen strikes a chord that really resonates – particularly in linking PENN Medicine's aspirations to those of our philanthropists. That's really the crux of this campaign.

As a lifelong Penn citizen, I've never seen this place so energized. As a physician, I've never seen a time of such progress and potential in medicine. And as proud member of the Medical Class of 1962, I've never seen my alma mater in stronger standing, in the nation and the world.

We have so many great things to accomplish.

Consider some of the directions our research is going. For example, the promise of personalized medicine, which we're already seeing in cancer treatment. The urgency of our groundbreaking work with Alzheimer's disease. And translational medicine, with its power to move new therapies much more quickly from the laboratory to patients, is an area where Penn is really poised to lead the charge.

Our Global Health Program just keeps growing – our students jump at the chance to go study and practice medicine in another country. The only constraint we face is funding.

In this campaign we're going to raise \$100 million for scholarships, and I'm thrilled about that. It will help us continue to attract the very best and brightest medical and post-doctoral students. It plays a huge role in bringing in the best faculty. And having a scholarship can make a huge impact on a medical student's career choices. The School of Medicine attracts young people who are really enthusiastic and idealistic about helping people – more so, I sense, than a lot of other medical schools

We've already raised more than \$400 million toward our goal. All of you are behind that number, just as you're behind so much of the great work going on. It will be my privilege and honor to make history with all of you.

Recent Gifts

The Abramson Family Foundation continues to support research into the causes and cure for cancer, contributing \$7.5 million as part of its \$100 million pledge for the Abramson Family Cancer Research Institute. **Madlyn Abramson** is a trustee of PENN Medicine.

Arthur Peck, M.D. '52, funded a \$50,000 gift annuity to support Alzheimer's disease research at the Center for Neurodegenerative Disease Research. The Center, under the direction of Virginia M.-Y. Lee, Ph.D., and John Trojanowski, M.D., Ph.D., works to improve the understanding, diagnosis, and treatment of late-life neurodegenerative disorders such as Alzheimer's disease, Parkinson's disease, and Amyotrophic Lateral Sclerosis (ALS, or Lou Gherig's disease).

Alumni Events

April

Thursday, April 3 – Elizabeth Kirk Rose Women in Medicine Dinner, 6:00 – 9:00 p.m., Philadelphia

Sunday, April 27 – Helen O. Dickens Memorial Dinner, 7:00 – 10:00 p.m., Philadelphia

Monday, April 28 – University Campaign Kickoff Event, 8:00 – 10:00 p.m., Chicago

May

Wednesday, May 7 – University Campaign Kickoff Event, 6:00 – 7:30 p.m., New York City

Friday-Sunday, May 16-18 – Medical Alumni Weekend, Philadelphia



Progress Notes

Send your progress notes to:

Andrea Pesce
Assistant Development Officer
PENN Medicine Development
and Alumni Relations
3535 Market Street, Suite 750
Philadelphia, PA 19104-3309

Julio Armando Lavergne, M.D. '35, G.M. '50, Panama City, Panama, recently published memoirs, in which he dedicated many pages to his years as a student at Penn, where he also earned his undergraduate degree. He included photographs of his time on campus. A prominent doctor in Panama, he delivered many babies, among them the former president of Panama, Ernesto Perez Balladares. Lavergne was a founding member of the University of Panama School of Medicine, founder of APLAFA (the Panamanian Association for Family Planning), and a founding member of the Panamanian Society of Obstetricians and Gynecologists. He is the oldest member of the Penn Alumni Club of Panama.

Thomas E. Steele, M.D. '62, has published *Outpatient Psychiatry: A Beginner's Guide* (W. W. Norton, 2007). The book provides an overview for psychiatric residents and early-career psychiatrists of five therapeutic competencies: dynamic psychotherapy, cognitive-behavioral psychotherapy, brief psychotherapy, supportive psychotherapy, and psychotherapy with psychotropic medication. Steele is professor of psychiatry and behavioral sciences at the Medical University of South Carolina, where for more than 25 years he has been the director of the department's primary site for residents learning to work with outpatients.

Harvey M. Rosen, D.M.D. '71, M.D. '73, G.M.E. '79, received an Alumni Award of Merit from Penn's School of Dental Medicine Alumni Society during last May's Alumni Weekend, "in grateful recognition of love for and loyalty to Penn Dental Medicine, excellence in the profession of dentistry, and community involvement." He is chief of plastic and reconstructive surgery at Pennsylvania Hospital.

Robert Yarchoan, M.D. '75, Bethesda, Md., received the first N.I.H. World AIDS Day Award in December 2006 for his work in helping to develop the first effective AIDS drugs. The awards will be given each year to N.I.H. scientists and managers who have made exceptional contributions to the AIDS research efforts – either for original scientific research or for programmatic support for research. Yarchoan serves as head of the Retroviral Disease Section at the National Cancer Institute.

Justin Lavin, M.D. '75, G.M.E. '79, received the Outstanding Clinical-Faculty Award from the Northeastern Ohio Universities College of Medicine. A professor of obstetrics and gynecology there, he serves as chair of maternal-fetal medicine at Children's Hospital Medical Center of Akron.

Mark R. Munetz, M.D. '76, has been appointed the Margaret Clark Morgan Foundation Endowed Chair of Psychiatry at the Northeastern Ohio Universities College of Medicine in Rootstown, Ohio.

Elliot J. Sussman, M.D., M.B.A., G.M.E. '80, president and chief executive officer of Lehigh Valley Hospital and Health Network, was named chair-elect of the Association of American Medical Colleges. Since 1993, Sussman has overseen the hospital system, which is a clinical affiliate of the Pennsylvania State University College of Medicine, where Sussman also serves as the Leonard Parker Pool Professor of Health Systems Management, professor of medicine, and professor of public health sciences. Previously, he had been executive director for clinical practices and associate professor of medicine at the University of Pennsylvania, as well as associate administrator and director of the clinical effectiveness program at HUP. His M.B.A. degree is from the Wharton School, and he was also a Robert Wood Johnson Clinical Scholar at Penn.

Douglas A. Swift, M.D. '80, G.M.E. '83, Philadelphia, an anesthesiologist at Pennsylvania Hospital, was recently inducted into the Wall of Fame of Not-

tingham High School in Syracuse, N.Y. The first graduate of Amherst College to enter professional football, Swift was a linebacker for the Miami Dolphins for six seasons; made the All-AFC Team; and played in three Super Bowls.

Mark Schiffman, M.D. '82, M.P.H., received the American Cancer Society's Medal of Honor for Clinical Research this fall. He was honored for his dedication to molecular epidemiology that relates to the human papillomavirus. According to the Society, "Schiffman's ambitious natural history and biomarker immunology research studies, combined involving more than 40,000 subjects, have helped and will help determine the most effective strategies for cervical cancer prevention." Schiffman joined the National Cancer Institute as a staff fellow in 1983 and currently serves as a senior investigator in the Division of Cancer Epidemiology and Genetics there.

Philip Linden, M.D. '92, recently moved to Cleveland, where he is the chief of thoracic surgery at Case Medical Center and associate professor of surgery at Case Western School of Medicine.

Dongsheng Duan, Ph.D., G.M.E. '97, an associate professor of molecular microbiology and immunology at the University of Missouri-Columbia, was one of the authors of a recent study in *Circulation Research* that examined whether gene and/or stem cell therapy could help the heart. They concluded that such therapy could help a muscular dystrophy patient maintain a normal lifestyle if as little as 50 percent of the cells of the heart are healthy. "This is the first time that we have concrete evidence that partial gene or cell therapies will be effective for preventing heart disease in a mouse model of muscular dystrophy," said Duan.

Nahush A. Mokadam, M.D. '98, has completed two years of cardiothoracic surgery at the University of Washington in Seattle after taking his residency in general surgery at Washington University in St. Louis. He is now assistant professor of cardiothoracic surgery and associate

director of heart-transplant and mechanical-circulatory support at the University of Washington Medical Center in Seattle.

Bindi K. Shah-Johnson, M.D., G.M.E. '01, and **Todd Johnson**, M.D. '00, Bryn Mawr, Pa., are the parents of a second daughter, Priya Shah Johnson, born on February 28, 2007. Shah-Johnson practices cardiac electrophysiology at Cornell University Medical Center. Johnson has joined MDS, Inc., a life sciences company that provides products and services for the development of drugs and diagnosis and treatment of disease, as senior vice president of strategy and corporate development.

Robert Wong, M.D. '03, and Emily Goodwin, C '97, were married last Memorial Day weekend. They have moved to San Francisco, where he has begun a fellowship in vitreoretinal surgery at California Pacific Medical Center. She finished a graduate degree in textile design at Philadelphia University and will be contracting work in textiles and in web design.

Andrew deLemos, M.D. '05, Cambridge, Mass., will be completing his internal-medicine residency at Massachusetts General Hospital, to be followed by a gastroenterology fellowship there. He and Genevieve FitzGerald deLemos, both 1998 graduates of Penn's College of Arts and Sciences, are the parents of a son, Benjamin, born on April 15, 2007. Genevieve is corporate counsel for Genzyme.

Kimberly G. Noble, Ph.D. '05, M.D. '07, married Eric Carvin on May 26 in Philadelphia. Having graduated from Penn's M.D./Ph.D. program last spring, she has begun a pediatrics residency at Columbia University's Children's Hospital of New York. Carvin is a news editor at the Associated Press.

OBITUARIES

Josef E. Martin, M.D. '33, Ormond Beach, Fla.; March 15, 2002.

William B. Patterson, M.D. '36, Wailuku, Hawaii, a retired obstetrician-gynecologist; December

29, 2006. He continued his medical training at Geisinger Hospital in Danville, Pa., and at Pennsylvania Hospital. From 1941 to 1961 he served as a plantation physician for Hawaiian Commercial & Sugar Co. and later for Wailuku Sugar Co. In 1961 he and a group of physicians founded the Maui Medical Group in Wailuku, where he practiced until he retired in 1979. He wrote an autobiography, *From the Isle of Skye to the Isle of Maui*, about his life on the island.

Frank F. Allbritten Jr., M.D. '38, G.M.E. '45, Cunningham, Kan., emeritus professor at the University of Kansas Medical Center; May 16, 2005. After completing his surgical residency at Pennsylvania Hospital, he entered the United States Army Medical Corps and rose to the rank of lieutenant colonel. He then became chief of surgery at Jefferson Medical College. There, he worked with Dr. John H. Gibbon Jr. on a heart-lung machine that was successfully used on a patient in 1953. The following year, Allbritten joined the University of Kansas as professor of surgery and chair of the department. Between 1954 and 1971, he published more than 100 articles on thoracic, pulmonary, and esophageal disorders. He retired in 1972.

Helen M. Aff Drum, M.D., G.M.E. '38, St. Louis, Mo., a retired pediatrician for the St. Louis County Health Department; September 11, 2007.

Norman E. Mendenhall, M.D. '38, Sudbury, Mass., a retired obstetrician-gynecologist; January 1, 2007. During the 1940s, he began his own private practice in Johnstown, Pa. He served on the staffs of Conemaugh Valley Memorial, Mercy, and Lee hospitals. Interested in aviation, he was an examiner for the Federal Aviation Administration, performing the physical examinations for licensing pilots. With an undergraduate background in aeronautical engineering, he was able to maintain and repair his own aircraft, including its electronic equipment. During World War II, he served with the U.S. Army Air Force Aviation Medical Corps. He con-

ducted altitude training of B-26 pilots and crew, and he set up the altitude-training unit for B-24 and B-29 bombers at Edwards Air Force Base in California.

John J. Euliano, M.D. '40, Erie, Pa., a retired orthopaedic surgeon who had been chief surgeon at Shriner's Hospital; December 23, 2005.

Ralph T. Irwin, M.D. '40, Yuma, Ariz., director of medical education at Yuma Regional Medical Center; March 13, 2005. In 1949, he was responsible for the health, exercise, and diet of pilots who would fly *City of Yuma*, an Aeronca plane that set a world record for time staying airborne – 1,124 hours. The record stood for nine years.

James J. McCort, M.D. '40, Walnut Creek, Calif.; June 12, 2006. Following an internship at the Fitzgerald Mercy Hospital in Darby, Pa, he trained as a resident in radiology at the University of Maryland and at the Massachusetts General Hospital. During World War II, he served as a physician in the U.S. Army. From 1947 to 1952, McCort was an instructor in radiology at the Harvard Medical School and a radiologist at Massachusetts General. In 1952, he became director of the Department of Radiology at the Santa Clara Valley Medical Center in San José, Calif., and two years later was appointed clinical professor of radiology at the Stanford University Medical School. A founding member of the American Society of Emergency Radiology, he had been a fellow of the American College of Radiology, a guest examiner for the American Board of Radiology, and president of the California Radiologic Society. He had also been president of the medical staff at Santa Clara Valley Medical Center and a member of the N.I.H. Consensus Development Panel on Magnetic Resonance Imaging. In 1986, he served as president of the Radiological Society of North America, which presented him with its highest honor, the RSNA Gold Medal, for his many contributions to radiology and the Society. McCort also served as president of the Santa Clara Branch of the

American Cancer Society, vice president of the American Heart Association of Santa Clara County, and chairman of the Health and Welfare Commission of Santa Clara County. He had a keen interest in abdominal imaging, with a special expertise in the imaging of trauma. In 1966, he published his first book, *Radiographic Examination in Blunt Abdominal Trauma*. He was also coeditor of *Abdominal Radiology* and coauthor of *Trauma Radiology*.

Stanford B. Rossiter, M.D. '40, Palo Alto, Calif., emeritus professor of radiology at Stanford University Hospital and School of Medicine; April 7, 2007. He served in World War II as a physician and a base radiologist in the Army, including acting as a triage officer at the Battle of the Bulge in 1944. After the war, he spent two months at the French Neurosurgical Institute in Paris, where he learned myelography, a radiographic examination that uses a contrast medium to detect spinal cord injuries, cysts, and tumors. After completing his residency in radiology at the University of California, San Francisco, he organized the Menlo Medical Clinic in Menlo Park and, in 1950, became the first radiologist at Sequoia Hospital in Redwood City. Along with one other physician, he also ran the radiology division of the Palo Alto Veterans Administration Hospital. As late as 2005, at 91 years of age, he had been one of the oldest physicians on duty, serving 36 hours a week at Stanford Medical Center and the VA Hospital in Palo Alto. Last year, he received the Lifetime Achievement Award from the Stanford Department of Radiology.

Albert H. Voegele, M.D. '40, Mansfield, Ohio, a physician who had practiced for 59 years, until his retirement in 1999; August 28, 2006. He had been with Mansfield General Hospital.

Henry M. Suckle, M.D. '41, Woodside, Calif., a retired neurological surgeon who had served as chief of staff at San José Hospital; February 19, 2007. As a medical student, he was elected to Alpha Omega Alpha.

Edgar S. Baum, M.D., '42, Portland, Ore.; September 5, 2006. In 1994, he had a show of his paintings at Penn's Faculty Club.

Edward M. Sirlin, M.D. G.M.E. '42, Fort Wayne, Ind.; June 12, 1999.

Guerrant H. Ferguson Jr., M.D. '43, Narberth, Pa., a physician who had been on the staff of Bryn Mawr Hospital for 50 years; February 3, 2007. He worked briefly at the Veterans Administration before opening a private practice in Bala Cynwyd in 1947. He was also on the teaching staff of the old Presbyterian Hospital. At Bryn Mawr, he chaired the staff-admissions committee for 10 years. He received a Legion of Honor award from the Chapel of Four Chaplains in 1984. During World War II he was a captain in the U.S. Medical Corps, 1944-46, serving at the fleet headquarters in Guam and in the U.S. Army occupation of Japan.

W. North Sterrett, M.D. '43, New Oxford, Pa.; November 10, 2006. During World War II, after a brief internship and some military training, he was assigned to the 32nd General Hospital Unit and spent the end of World War II in Osaka, Japan. It was there, in 1946, that Sterrett first met General Eisenhower, then commander of Allied Forces in Europe. The general was visiting the Pacific theater, where the war against Japan was still going on. After the war, Sterrett returned to Pennsylvania, setting up a medical practice in Arendtsville with his brother-in-law. In late 1960, Sterrett received a telephone call from Dr. Harold Johnson, a Gettysburg physician, who had been asked to become the primary physician for the Eisenhowers when they moved to Gettysburg. Johnson had agreed, but sought Sterrett's help. Sterrett remained the Eisenhower's physician until the former president died in 1969; Sterrett continued as Mammie Eisenhower's physician for the next 10 years, until her death in 1979, and succeeded in getting her to stop smoking. In 1990, Sterrett retired as a family doctor and began his tenure as a tour guide at the Eisenhower farm.



Robert F. Wortmann, M.D. '43, Hilton Head Island, S.C., a retired obstetrician-gynecologist; August 21, 2007.

Harry H. Brunt Jr., M.D. '45, Hockessin, Del., a retired psychiatrist; January 6, 2007. He had worked at the Jersey Shore Medical Center.

George G. Graham, M.D. '45, G.M.E. '59, Gibson Island, Md., founding director of the of human-nutrition division in the Department of International Health at the Bloomberg School of Public Health at Johns Hopkins University; January 14, 2007. He held positions at the Cleveland Clinic and the British-American Hospital in Lima, Peru, including acting medical director, 1961-65; while in Peru he established the Institute for Nutritional Research and served as its president until 1990. He was chief pediatrician at the old Baltimore City hospitals. In 1968 he was appointed professor of international health at what was then the Johns Hopkins School of Hygiene and Public Health, and in 1976 he became the founding director of human nutrition. During the 1980s, Graham served on the Presidential Task Force on Food Assistance. In 2005, Johns Hopkins established the George G. Graham Professorship in Infant and Child Nutrition. Dr. William C. MacLean, a former student, recalled, "He was also a wonderful teacher and mentor. Nobody in my training had ever focused on nutrition or made it come alive."

Joseph L. Grant, M.D. '46, G.M.E. '50, Norwich, Vt., chief of medicine at the VA hospital in White River Junction from 1955 until his retirement in 1983; February 16, 2007. He had served as chief of pathology for the European theater with the U.S. Army occupation in Germany.

Josephine Gross Kety, M.D., G.M.E. '46, Jamaica Plain, Mass.; June 8, 2003. Her husband, Seymour S. Kety, M.D. '40, died in 2000.

Levon D. Yazujian, M.D., G.M.E. '46, New Hope, Pa.; March 3, 2007. An ophthalmologist, he had worked at Wills Eye Hospital and Mercer Hospital.

Howard P. Steiger, M.D., G.M.E. '47, Pawleys Island, S.C.; June 23, 2007. He earned his medical degree at Duke University and interned at the U.S. Marine Hospital in New Orleans. After leaving the service in 1941 to begin a residency in dermatology at Penn, he was recalled to the United States Public Health Service the following year. In 1945, Steiger began a private dermatology practice in Charlotte. He played flute and piccolo for many years in local bands. He served on the Charlotte and the N.C. boards of health and had been president of the Mecklenburg Cancer Society.

Richard H. Dennis, M.D., G.M.E. '48, G.M.E. '50, Punta Gorda, Fla.; April 2006.

Harold E. Pierce Jr., M.D., G.M.E. '48, Philadelphia, a dermatologist and cosmetic surgeon in the Philadelphia area for more than 50 years; October 25, 2006. In the late 1940s, he was chief of dermatology at the former Mercy-Douglas Hospital and at Holmesburg Prison. A specialist in microdermabrasion, he treated complex skin disorders and performed cosmetic surgery and hair transplants. During the 1950s, he founded West Park Clinic in West Philadelphia, a dermatological practice primarily for African Americans. In the early 1980s, he established Pierce Cosmetic Surgery Center in Bala Cynwyd, Pa., where he participated in some of the first liposuction procedures on African Americans. He eventually moved his practice to the Philadelphia College of Osteopathic Medicine, before retiring in 2005. In 1982 he edited the book *Cosmetic Plastic Surgery in Nonwhite Patients*. Pierce taught dermatology surgery at Howard University Medical School in Washington, D.C., and taught dermatology at Philadelphia College of Osteopathic Medicine. In 2003 the National Medical Association honored him with a Lifetime Achievement Award. Pierce served in the U.S. Army Air Corps, 1951-54. As a captain, he was head of dermatology at the 1600th U.S. Air Force Hospital at Westover Air Force Base in Massachusetts.

Jerry E. Schmitthenner, M.D. '48, Barnesville, Ohio; May 29, 2007. A retired internist, he had worked at the Barnesville Medical Center.

Donald C. Carlton, M.D. '49, Canadensis, Pa., retired assistant vice president at what was then Hoffman-LaRoche Inc., the health-care company; September 24, 2006.

Claude R. Joyner Jr., M.D. '49, G.M. '53, Sewickley, Pa., a former professor of medicine at Penn; November 17, 2006. Considered the father of echocardiography, he was honored for his work in the field by the Pittsburgh Chapter of the American Heart Association earlier in 2006. He was a medical resident at the Bowman Gray School of Medicine and in the U.S. Navy Medical Corps before coming back to Penn as a fellow in cardiology. He taught at Penn from 1952 to 1971. In 1972, he became chair of the Department of Medicine at Allegheny General Hospital, as well as a clinical professor of medicine at the University of Pittsburgh. From 1984 to 1992, he also served as director of the cardiology division at Allegheny General. In 1992, he stepped down as chair of the department but continued for a while as an associate dean of the medical school. According to Richard Shannon, M.D., Joyner's successor as chair of the department and now chair of Penn's Department of Medicine, Joyner began his pioneering work on echocardiography in the 1960s with the notion that sound might be used to image the heart, just as sonar was used for imaging by ships in World War II. "There are hundreds of cardiologists who trained with Claude and have gone on to have extraordinarily distinguished careers with him," said Shannon.

Richard C. Long, M.D., G.M.E. '49, Wynnwood, Pa.; June 1, 2006. He was retired chief of service and associate professor of surgery at McGill University.

Gaylord W. Ojers, M.D., G.M.E. '49, Rosemont, Pa.; November 14, 2006. He had been a clinical professor of ophthalmology at Penn.

A. Thomas Richie, M.D. '49, Doylestown, Pa., a retired family medicine practitioner; August 28, 2005.

Joseph G. Ruhe, M.D. '49, Elizabeth, Pa.; March 17, 2007. He had retired from the U.S. Army.

Clyde E. Rush, M.D., G.M.E. '49, Amarillo, Texas, a retired thoracic surgeon; May 1, 2007.

Ralph Schlaegar, M.D., G.M.E. '49, Scarsdale, N.Y., a retired radiologist; March 13, 2007. He had worked at Columbia Presbyterian Medical Center.

Rolland W. Wilkins, M.D. '49, Aurora, Colo.; May 6, 1996.

Stephen C. Wright, M.D., G.M.E. '49, Blairsville, Ga.; June 2, 2006.

Russell Scott Jr., M.D. '50, G.M.E. '54, Houston, Texas, emeritus professor of urology and former chair of urology at Baylor College of Medicine; May 24, 2006. He was the first full-time urologist on its faculty. Previously, he had been a clinical professor of urology at the University of Colorado and a consultant to the U.S. Veterans Administration Hospital, and he had been in private practice in Aspen, Colo. A trustee of the American Board of Urology, he had served as director of education for the American Urological Association. The association had presented him with the Ramon Guiteras Award, its highest honor for contributions to urology. He also received the President's Award from the American Foundation for Urologic Disease. He was former medical director of Saudi Arabia's King Faisal Specialist Hospital.

John R. Caldwell, M.D., G.M.E. '51, Mount Pleasant, Mich.; August 3, 2006. He had been a physician with the Henry Ford Hospital.

Robert W. Datesman, M.D. '51, Linwood, N.J., an internist and cardiologist who had offices in several locations; September 7, 2007.

Miles Edward Drake, M.D., G.M.E. '51, Naples, Fla., a retired obstetrician-gynecologist; September 3, 2006.

Ruth Abrams Dillard, M.D. '51, College Station, Texas, a retired pediatrician; August 10, 2007. She was an associate professor of pediatrics at the University of Texas Medical Branch in Galveston. A member of Alpha Omega Alpha, she married her classmate Edgar Archer Dillard Jr. the day they graduated from medical school. After completing her pediatric training, she practiced in Boynton Beach, Fla., as a faculty member at UNC-Chapel Hill, in Haiti, in Viet Nam, and in Seattle, before arriving in Galveston. After her retirement in 1991, she continued to practice medicine on short-term medical missions and at Hebron Colony, a free residential Christian ministry for alcoholics and drug addicts near Boone, N.C., where she was a full-time volunteer six months of the year. She was an active birder, a member of the National Audubon Society, the Sierra Club, the Nature Conservancy, and the Board of Directors of Hebron Colony Ministries, Inc. Her husband died in 2003.

Joseph M. Hopen, M.D., G.M.E. '51, Hollywood, Fla., an ophthalmologist; February 20, 2007.

Eugene C. McCann, M.D., G.M.E. '51, Norwell, Mass., retired chief of obstetrics and gynecology at Maine Medical Center; March 1, 2007. He entered the Navy in 1943 and served as a medical officer aboard the *Bear of Oakland*, which patrolled off Greenland during World War II.

Gilbert F. Norwood, M.D. '51, Hummels Wharf, Pa., a retired orthopaedic surgeon; December 15, 2006. He had been chief of staff at Sunbury Community Hospital. During World War II, he served in the U.S. Army. From 1953 to 1955, he was a medical officer serving with the U.S. Air Force in Japan.

Luther H. Parr, M.D., G.M.E. '51, Houston, Texas, a thoracic surgeon; May 5, 2006.

Robert E. Sass, M.D., G.M.E. '51, Pittsburgh, a retired family practitioner in Hermitage, Pa.; October 18, 2006. He was decorated in World War II. For 30 years a general and thoracic surgeon at what is now Sharon

Regional Health System, he rose to chief of both fields. He had also been president of Sharon General Hospital's medical staff as well as chair of surgery and infection control.

Eugene J. Gillespie, M.D., G.M.E. '52, Clearwater, Fla.; September 18, 2006.

Samuel H. Horton, M.D., G.M.E. '52, Beaufort, S.C.; March 16, 2007. He served in the U.S. Navy Medical Corps in the Korean War.

Heber E. Yeagley, M.D. '52, Wyoming, Pa.; March 8, 2006. He had been chairman of radiology at Reading Hospital and Medical Center and president of West Reading Radiology Associates.

Robert F. Barnett Jr., M.D. '54, Cadillac, Mich., a retired radiologist; February 13, 2007. During the 1950s, he served as a surgeon in the U.S. Navy Marines.

William H. Frank, M.D., G.M.E. '54, Davidsville, Pa.; December 21, 2006. He was retired director of medical affairs at U.S. Steel.

S. Steven Wolfson, M.D. '54, West Hartford, Conn., a retired internist and cardiologist who had maintained a practice there for more than 35 years; December 22, 2006. Early in his career he had focused on forensic medicine, serving as an expert witness in Connecticut courts. He was a longtime member of the West Hartford Republican Town Committee and was a justice of the peace in the Town of West Hartford. He had been a second lieutenant in the U.S. Air Force Reserve.

Paul L. Carmichael, M.D., G.M. '55, Park City, Utah; December 26, 2006. He was an ophthalmologist who had maintained a practice in Lansdale, Pa., for more than 40 years, until retiring in 1996. He was on the staff of North Penn Hospital and Wills Eye Hospital. A licensed pilot, he enjoyed flying, skiing, and outdoor recreation. During the Korean War, he served in a mobile army surgical hospital unit.

Nicholas H. Nauert Jr., M.D., G.M.E. '55, Houston, Texas, an internist retired from Kelsey-

Seybold Clinic at Copperfield; October 7, 2006.

John A. Warden, M.D., G.M.E. '56, Alburg, Vt., a retired radiologist; September 2, 2007.

Alfred Lazarus, M.D., G.M. E. '57, Wilmington, Del., a retired gastroenterologist; December 16, 2006. He was chief of gastroenterology at the Medical Center of Delaware for many years and had been a clinical professor of medicine at Thomas Jefferson University. He served on the board of Blue Cross and Blue Shield of Delaware for more than 25 years. In World War II, he was a first lieutenant in the U.S. Army Medical Administrative Corps, serving in the Philippines and occupied Japan.

Stephen J. Lewis, M.D. '58, Wyoming, Ohio; August 30, 2007.

Donald M. Beardwood, M.D. '59, Willow Grove, Pa., an endocrinologist; October 26, 2006. He retired from Abington Memorial Hospital.

Robert J. Kirschner, M.D., G.M. '59, Fort Lauderdale, Fla.; September 4, 2007. A graduate of Jefferson Medical College, he was affiliated with Graduate Hospital of the University of Pennsylvania and with Wills Eye Hospital. He served as acting director of ophthalmology in both institutions and as director of the Fight for Sight Eye Clinic. He taught at the Graduate School of Medicine and at the Women's Medical College of Pennsylvania. He was a 25-year member of the Ophthalmic Club of Philadelphia.

William G. Smith, M.D. '59, Fallbrook, Calif.; September 30, 2006. He had been professor of psychiatry at the Rockford School of Medicine of the University of Illinois and had worked for the Illinois Department of Public Health.

Alfred E. Duncan III, M.D. '60, Denver, a psychiatrist; August 17, 2006.

J. William Rosenthal, M.D., G.M.E. '61, New Orleans, retired president of New Orleans Eye Specialists; June 28, 2007.

Kathryn L. Popowniak, M.D. '62, Prescott, Ariz.; May 5, 2006. After taking her internship and residency at the Cleveland Clinic, she also did her fellowship in hypertension and renal disease there and joined the clinic's staff. She retired in 1995. Earlier, she had earned her R.N. degree and graduated Phi Beta Kappa from Allegheny College with a B.A. degree in chemistry. Popowniak served on the organ recovery team committee and the education committee of the Transplantation Society of Northeastern Ohio. Recipient of the Outstanding Woman Physician Award of the Women's Medical Society of Cleveland in 1991, she served as president of the Society for four years. She was appointed chair of the medical ethics committee of the American Medical Women's Association in 1992.

Bruce S. Keenan, M.D. '64, Asheville, N.C.; August 17, 2007. A noted pediatric endocrinologist in Houston for 26 years, Keenan completed his internship, residency, and clinical fellowship in pediatric endocrinology at Duke University Hospital. He then took a pediatric endocrinology fellowship in research at Johns Hopkins. While in the Navy, he served at the National Naval Hospital, Bethesda, Md., and taught at Georgetown University. At Baylor College of Medicine in Houston, Keenan focused on research and development for treatment in specialized areas of pediatric endocrinology. A staff physician at Texas Children's Hospital, he was a professor of pediatric endocrinology at the University of Texas Medical Branch at Galveston from 1986 to 2000 and served as director of the endocrinology division there. Before his retirement, he served as a staff physician at East Tennessee Children's Hospital in Knoxville and was on the faculty of the University of Tennessee.

Michael M. Drucker, M.D. '65, Newport Coast, Calif., an orthopaedic surgeon who practiced in Newport Beach for 25 years; June 25, 2006. He had served in the Navy.

Gary G. Nicholas, M.D. '65, G.M.E. '72, Upper Milford, Pa.,

LEGACY GIVING

A Superb Start



Every day, when Benjamin Natelson, M.D. '67, walked into the library of the School of Medicine in what is now called the John Morgan Building and saw the famous Thomas Eakins painting The Agnew Clinic, he knew he was somewhat special.

"I felt pampered as a student," he says. "The quality of the education, the professors, everything at the School was just brilliant."

To show his gratitude for his excellent medical education, Dr. Natelson, along with his wife, Gudrun Lange, Ph.D., set up a Charitable Remainder Unitrust (CRUT), which was recommended by his financial advisor. CRUTs provide flexibility, a hedge against inflation, and tax benefits to the donor that other gift vehicles may not provide. In addition, at the end of the trust's term, the remaining principal distributes to charity. In the case of the Natelsons' CRUT, the School of Medicine will benefit.

"I got a superb education, a superb start at a profession, and the CRUT is a great vehicle, not only to provide some income, but to provide something good to my alma mater," says Dr. Natelson.

Dr. Natelson is a professor of neuroscience at the University of Medicine and Dentistry of New Jersey in Newark. He specializes in treating patients who suffer from chronic pain and fatigue. Dr. Natelson recently came out with his third book, *Your Symptoms Are Real: What to Do When Your Doctor Says Nothing is Wrong*. As he describes it, Dr. Natelson has come a long way since his first year at the School of Medicine. "I did not know anything about medicine – it was overwhelming." Natelson credits mentors like Truman Schnabel, M.D. '43, and the late Eliot Stellar, M.D., for inspiring him throughout his schooling.

A CRUT like the Natelsons' is one of a multitude of creative gift opportunities that benefit both the School of Medicine and its donors. As you plan your financial future, the Office of Planned Giving is ready to assist in developing an appropriate strategy to incorporate your charitable objectives. Contact Christine S. Ewan, J.D., associate director of planned giving, at 215-898-9486 or at PENN Medicine, 3535 Market Street, Suite 750, Philadelphia, PA 19104-3309. You can e-mail her at cewan@upenn.edu. Also, visit the new web site of the Office of Planned Giving: www.med.upenn.planyourlegacy.org.

a vascular surgeon and director of surgical education at Lehigh Valley Hospital in Allentown, Pa., for 21 years; January 22, 2007. Earlier, he had taught general and vascular surgery at Penn State University College of Medicine at Hershey for 10 years.

Russell H. Mitchell, M.D., G.M.E. '69, Leesburg, Va., a dermatologist; May 17, 2006. He served in the Navy for 25 years.

Isaac Willis, M.D., G.M.E. '69, Atlanta; August 7, 2007. After earning his medical degree from Howard University School of Medicine, he completed his internship, dermatology residency, and fellowship at HUP. His academic career included faculty appointments at Penn, the University of California at San Francisco, Johns Hopkins University, Emory University, and Morehouse School of Medicine. He also served in the Army, rising to the rank of colonel and serving as commander of the 3297th U.S. Army Hospital. Among the honors he received were an honorary doctor of science degree and the Bennie Trailblazer Honor from Morehouse College. He served on the National Advisory Council of the National Institute of Arthritis and Musculoskeletal and Skin Diseases.

Harold B. Heiss, M.D., G.M.E. '71, Fort Lauderdale, Fla., a retired dermatologist; October 1, 2006.

F. James Connaughton, M.D., G.M.E. '77, Fort Lauderdale, Fla., a former assistant professor of medicine at the University; December 23, 2006. He also had maintained a private practice in Phoenixville, Pa., from 1976 until his retirement. He served in the U.S. Navy 1968-69, including a tour at the U.S. Naval Hospital in Danang, Vietnam.

FACULTY DEATHS

John E. Biaglow, M.S., Ph.D., Sicklerville, Pa., professor of radiation oncology; September 14, 2007. He earned a master's degree and doctorate in biochemistry from Loyola University in

Chicago. Biaglow had a reputation as a groundbreaking cancer biochemist when he joined the Department of Radiation Oncology at Penn in 1984. He later became director of the department's research division. From 1987 to 1996, he directed the tumor metabolism program at the University of Pennsylvania Cancer Center. He published 130 articles in scientific journals. His research involved agents called thiols, which protect cells from radiation damage. Increasing the level of such agents in the blood, for example, could eventually protect space travelers from dangerous radiation exposure. Biaglow also worked on developing medicines that would decrease the natural defenses against radiation in patients with cancerous tumors so that radiation and chemotherapy agents would be more effective. He was a counselor in the Radiation Research Society and in the International Society of Oxygen Transport to Tissue. He served on the Radiation Oncology Study Section of the N.I.H.

F. James Connaughton, M.D. See Class of 1977.

William A. Creasey, D. Phil., a clinical pharmacologist and former research professor of pharmacology and pediatrics; August 30, 2006. A member of the medical faculty at Yale University from 1959 to 1976, he came to Penn in 1976 as a lecturer in the Department of Pharmacology; three years later, he was appointed research professor there. He taught basic and clinical research of cancer chemotherapy and clinical pharmacology. He left the University in 1982. In later years, Creasey held positions at E. R. Squibb & Sons, VRG International, Information Ventures, Inc., and the American Association for Cancer Research, Inc.

Robert J. Kirschner, M.D. See Class of 1959.

Gaylord W. Ojers, M.D., G.M.E. '49. See class of 1949.

Isaac Willis, M.D., G.M.E. '69 See class of 1969.

Campaigns and Compacts

Beginning with its founding as the first medical school in America, our School of Medicine has had grand aspirations. In 1995, for example, our institution formally launched a five-year, \$600 million fund-raising campaign, “Creating the Future of Medicine: Learning, Discovery, Prevention, and Cure.” Then and now, we had many accomplishments to be proud of – and we were confident we had the people and the planning to live up to the goals we set. So our School and Health System are quite prepared to play a major role in the capital campaign the University of Pennsylvania officially announced in October. By any reckoning, its name is ambitious: “Making History: The Campaign for Penn.”

As reported elsewhere in this issue, the University’s overall goal is to raise \$3.5 billion for its programs. According to *The Chronicle of Higher Education*, Penn’s is currently the fourth-largest such effort among universities. PENN Medicine has been asked to raise \$1 billion of that total. I can assure you that when I entered medicine, I did not anticipate being in a situation that would involve such vast sums of money. But circumstances are very different today, and all our earlier efforts have brought us to a higher starting point. The University of Pennsylvania and its many schools, centers, and programs have a wonderful opportunity to advance, in the words of President Amy Gutmann, Ph.D., “from excellence to eminence.”

To be eminent means to stand out among our excellent peers. In fact, that was a goal we articulated five years ago when we shaped our strategic plan. One option, as we put it then, was maintaining PENN Medicine in its current state, “without new facilities, significant enhancement of the present infrastructure, or development of major new scientific and clinical programs.” That option would maintain PENN Medicine as “a very good but not a truly great institution.” Instead, we chose to pursue “a steeper upward trajectory” – in other words, toward eminence. The second



option, we made clear, would be much more difficult to achieve, “but offers much greater promise of achieving the potential of PENN Medicine.”

When President Gutmann took office in 2004, she announced her far-ranging vision for the University as a whole, the Penn Compact. That same vision continues to inform the “Making History” campaign. The Penn Compact has three main parts:

Increasing Access, so that an excellent Penn education can be made available to all outstanding students of talent and high potential who can benefit from and contribute to our University.

Integrating Knowledge, so that the most challenging questions and problems of our time can be solved by drawing the best from different disciplines and professional perspectives in our research and teaching.

Engaging Locally and Globally, so that, through collaborative engagement with communities all over the world, the University strengthens its ties with our neighbors and helps drive economic and technological development throughout Philadelphia and the Commonwealth.

These are goals PENN Medicine shares, and we have already taken major steps over the years in those directions. As a component of an ambitious University-wide campaign, we have the opportunity to support these goals and even lead the way in some areas. For example, PENN Medicine has a goal of \$200 million for preparing the medical leaders of tomorrow by supporting financial aid for graduate students; developing curricular innovations; and enhancing our educational facilities. A particular aim is to attract the best and most diverse students, regardless of their financial resources. As President Gutmann put it in the Penn Compact, “diversity and excellence go together.”

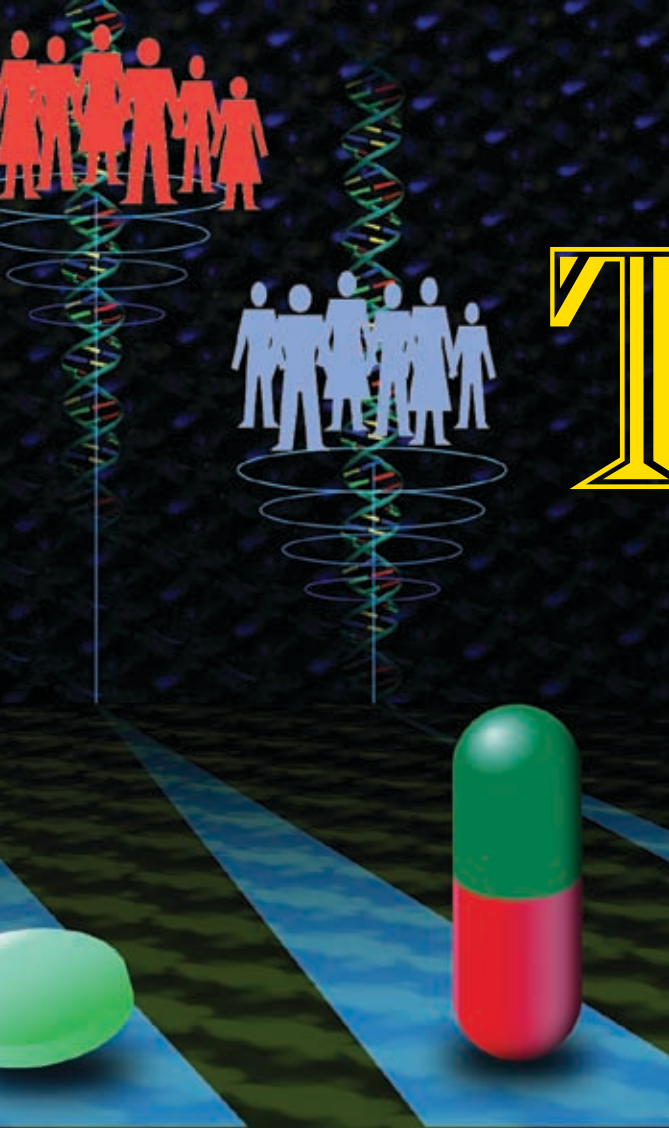
As for integrating knowledge, Penn has a long history of fostering interdisciplinary and interschool projects, and PENN Medicine has many centers and institutes that embody that tradition. Indeed, it makes perfect sense for an institution of varied schools and intellectually curious faculty members. One of the rubrics of our campaign is Create Knowledge. In part, we will do so by creating new facilities that foster collaboration between research and clinical programs and also by expanding our interdisciplinary institutes and centers. These approaches are vital as we confront such complex diseases as cancer, cardiovascular, diabetes, and neurological disorders.

In a University symposium earlier this year, President Gutmann stated that Penn has “an amazing health system, nurses and doctors and clinicians who solve problems day in and day out, and they do it in an integrated way. . . . That is in some ways a working model for the integration of knowledge.”

PENN Medicine has many examples of engaging locally and globally. We have been very involved with the Sayre School in West Philadelphia, helping to open a clinic there but also providing educational opportunities for its students. At the same time, the Penn-Botswana Program has benefited both the citizens of that nation and the medical students and residents whose education and training are all the richer for their experiences there. We are also very excited about the Ruth and Raymond Perelman Center for Advanced Medicine and the Roberts Proton Therapy Center, which will offer the best care – and very integrated care – to those in our immediate community and beyond. And that is the best kind of engagement.

Both PENN Medicine and the University have appreciated the support of alumni and friends over the years. We hope you will join us as – together – we make history. ♥

Arthur H. Rubenstein, M.B., B.Ch.
Executive Vice President of the University of Pennsylvania for the Health System
Dean, School of Medicine



T

he F.D.A. has referred to the “New Era of Personalized Medicine” and last year supported it with \$277 million. Some private groups see its enormous potential for making money. Many physicians are enthusiastic about its clinical impact. Although some questions about cost and privacy remain, the movement toward personalized medicine is very strong. At PENN Medicine, cancer specialists are among those taking the lead in this new paradigm.

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