If there is too much introspection during graduate school, and too little during the clinical rotations of medical school, the end of MD-PhD training is an ideal time to catch our collective breath. With the Scientist peering expectantly over one shoulder and the Physician tapping impatiently on the other, an MD-PhD student can be as disoriented as Alice in Wonderland when traveling between the lab and the wards. We squirmed when asked to solve differential equations after two years of medical school (even in HST), and we squirmed again when asked to recall the appropriate antibiotic for pneumonia after N years of graduate school. But even after a crash course with Genes V (or Genes VIII for the younger generation) and a furtive speed-read courtesy of Up-to-date, we realized that the unsettled feeling might have deeper psychological roots.

When Nobel Laureate Paul Nurse was invited for lunch with the MD-PhD students, he pointed out that physicians are trained to be confident and certain in their decisions, while scientists are trained to be skeptical and self-doubting. One member of the Class of 2007 argues that the psychological difference between scientist and doctor is actually essential, while the MD-PhD training offers a perspective that bridges the gap.

**SOPHIE CURRIER:** “The attitude of each world is appropriate for the task at hand. Physicians, especially surgeons, are required to make rapid decisions based on the knowledge available, which will always be somewhat inadequate. However, a scientist discovers knowledge and must put each statement that he or she makes through a long series of “qual-
SPLIT PERSONALITY

continued from page 1

ity tests” to ensure that the knowledge is as sound as possible. They play different roles in the same assembly line: the scientist provides the knowledge and the physician puts it to practice. An overly skeptical physician would never get anyone treated. And an overly hasty scientist could feed the entire system faulty information that could result in an amplified disaster for the entire medical community. But as physician-scientists we are trained to understand both roles... I believe that we have a better appreciation for how the entire process works, from basic science to patient care.”

Yet other graduates believe that the cultural divide is not as wide as it may appear. They argue that self-doubt is essential to medical decision-making, and that confidence in data and results is a necessary part of scientific life.

JAMES RHEE: “Even clinicians should always be skeptical and self-doubting. I think that’s why they constantly seek advice from colleagues and consults on the wards. It is only after very extensive testing, imaging, research, and discussion that we can arrive at a clinical diagnosis with near certainty, which is actually very much the nature of basic science, too.”

PHILLIP ERWIN: “While physicians must act with confidence, their hypotheses are constantly subject to revision according to the dynamics of a patient’s disease. I would say that while physicians are trained to be confident with each decision, well-placed skepticism about each step is vital to the physician’s decision-making. Similarly, a scientist must be self-doubting, but a sense of confidence in one’s hypothesis is necessary to be willing to go forward with experiments. Further, once all data are collected and a hypothesis is supported by evidence, scientists show their confidence by publishing their data. Indeed, while treatment decisions may be modified or even stopped altogether once a hypothesis is disproved, a publication is a permanent statement of one’s confidence in his findings.”

Nevertheless, there is no doubt that many cultural differences do exist between science and medicine. On a personal level, each MD-PhD student is faced with the challenge of adjusting from medical school to graduate school, and then to the clinical wards. Many of the readjustments are trivial, such as resetting the circadian clock back a few hours, but some are not.

BENJAMIN SOMMERS: “For me, the biggest adjustment going from the Health Policy PhD Program to medical school was the change from being treated as a colleague to being treated as a student. Graduate programs in social sciences tend to be much more informal and less hierarchical than medical school, and clinical rotations in particular. In grad school, you’re on a first-name basis with leading scholars. In med school, you are at the bottom of a long food chain. Your face-time with attendings is fairly limited, and you rarely call them anything other than “Dr.” But I still found that I received great teaching in both settings - it’s just a difference in culture and style.”

In addition to changes in the social structure, MD-PhD students must also adapt to dramatic changes in learning style.

SOPHIE CURRIER: “In research the goal is to identify even one tiny new understanding about the world around us, to add to the billions and billions of facts collected throughout human existence. The pace is slow and the skills needed are creativity and skeptical thinking. In medicine, at least initially, the skills needed are pattern recognition and recalling large volumes of information on human disease and treatment. I would suggest that these skills require completely segregated areas of the brain.”

JAMES RHEE: “I think the hardest adjustment for me was trying to know a few things in great detail versus many things in superficial detail. In lab, I was accustomed to spending much time and effort dissecting one particular observation, and trying to collect all the supporting data surrounding that observation. On the wards, I was asked to simply memorize and recite many tidbits of medical knowl-
Blacklow Named Director

CONTINUED FROM PAGE 1

directed a research laboratory since 1998. Dr. Blacklow’s laboratory focuses on the relationship between structure and function in proteins of the low-density lipoprotein receptor family and in human Notch proteins, achieving international recognition as a leader in mechanistic and structural studies of these two classes of receptor proteins.

We welcome Dr. Blacklow to his new role as director of the MD-PhD Program of Harvard Medical School, and look forward to the contributions of his leadership, experience, and insight will bring to our community.

In welcoming the new MD-PhD students at orientation on July 5, 2007, Dr. Blacklow stated, “I look forward to getting to know each of you as your studies progress, and am delighted to begin serving you as the new director of the MD-PhD Program. The program has never been stronger, thanks to the super leadership of the two previous directors, Chris Walsh and Nancy Andrews, and I hope to build on the foundation they have put in place over the past several years. In particular, my top priority will be to continue to find ways to integrate the programs of medical and graduate study to facilitate students in making progress towards timely completion of their dual degrees. I would also like to hear from all of the students to learn whether you have any suggestions or ideas about how we can make the program even better in the coming years.”

The MD-PhD Program salutes Dr. Joseph B. Martin who stepped down from his role as Dean of the Faculty of Medicine for the past 10 years. We are grateful for Dr. Martin’s active participation in our program and his generous support of the MD-PhD students during his decade long deanship. Shown above are students presenting Dr. Martin with the prize winning cake baked in his honor during the Society Olympics.

Many of us hope that as we continue to grow and learn, we may eventually combine the depth of scientific inquiry with the breadth of medical knowledge. In Erwin Schrodinger’s famous example of quantum mechanics, a cat is placed in a box with a canister of poisonous gas that is set up such that the radioactive decay of a single particle will open the canister. If the decay event occurs, the cat will die; as long as it fails to occur, the cat lives. In the absence of an observer, the particle and the cat exist as a superposition of both possible states. An MD-PhD student is much like Schrodinger’s cat, neither scientist nor physician alone, but in a mixed state of being that cannot be easily categorized. May the cultural differences between science and medicine be a source of energy and creativity as we move ahead.
The MD-PhD Program held its annual Spring Dinner in honor of this year’s 28 MD-PhD graduates on June 5, 2007. The MD-PhD class is the largest number in the program’s history. Drs. Nancy Andrews and Joseph Martin gave the traditional champagne toasts to the graduates following introductions by Drs. Stephen Blacklow and Allan Brandt. Graduate speakers included Drs. Rita Khodosh, Douglas Rubinson and Benjamin Sommers. Dr. Christopher A. Walsh also gave a special tribute to Dr. Martin who stepped down this year as the Dean. The evening was filled with special moments as grandparents, parents, students, faculty and staff celebrated the achievements of the MD-PhD Class of 2007.
Bringing Home the Pink
MD-PHDS HELP HST TO VICTORY
by Sarah Hill

Great battles are waged daily at Harvard medical school, in labs, in clinics, and even in the classroom. However, none are as legendary as the annual Society Olympics.

In these yearly games the first year students from each individual society including Cannon, Castle, Peabody, Holmes, and HST compete against each other in events such as dodge ball or a pie eating contest for the honor of “bringing home the pink,” the pink flamingo trophy that is.

According to many of the champion participants, a dynasty was created on May 11 when HST won for an unprecedented second year in a row. Some New Pathway students may liken this victory to “Revenge of the Nerds 2,” but for the 31 HST students who participated this year, 10 of whom are in the MD-PhD program, the friendships and memories forged in the process will never be forgotten.

This year’s theme was “HSTV: The Only Society in High Demand.” The t-shirts and banner illustrating this theme were designed by Erin Chen, a first-year MD-PhD known for her artistic talent.

The banner was featured in the procession choreographed by Sarah Hill. Every student participated in this event, which was a theatrical performance of five television shows including Scooby Doo, an HST vs. New Pathway Soccer Match, an animal show, a medical drama, and a final HST themed dance.

Among the day’s staged events, the iron chef style bake-off in which the students had to bake a retirement cake for Dr. Martin using only a box of cake mix and $8 worth of ingredients from the MEC vending machines was a crowd pleaser. The MD-PhDs took the lead in this, with Jenny Yang and Erin Chen helping HST to earn first place points with their stunning retirement cake (see page 3).

As the events came to a close, HST was uncertain as to whether or not they had won. They knew that had first place in the early events including the volunteer drive, thanks to Milena Andzelm, and the clothing drive, thanks to the ingenious ordering of 1400 pairs of socks from Pakistan.

However, when the results were announced, HST students claimed victory not just for the class of 2010, but for all the classes that have gone before us and for all of our professors. Years from now when we are on the wards, running our labs, and teaching classes ourselves, it won’t be the hours of studying we did for cardiology that we remember, rather it will be the practices on the steps of Gordon hall at 2 am and the friends we made in this process.

HST Leadership Changes

David Cohen, MD, PhD associate professor of medicine at HMS and associate professor in the Harvard-MIT Division of Health Sciences (HST) has been named Co-Director of HST. He will share responsibility for directing HST with Dr. Martha Gray, Professor Edward Hood Taplin Professor of Medical Engineering and Electrical Engineering at MIT and HST. David replaces Dr. Joseph Bonventre, who served as HST co-director since 1998.

The MD-PhD Program community wishes to express its gratitude to Dr. Bonventre, one of the early MSTP graduates of our program, for his many years of outstanding leadership as co-director of HST. We extend our best wishes to Dr. Cohen, also an alumnus of the MD-PhD Program, in his new role as co-director role of HST.

Of the new position, Dr. Cohen states, “After a long association with HST, it is a privilege to assume this leadership role. I look forward to working together with the HST faculty and students on educational and research programs at the rapidly developing interface between medicine and technology.”
Spring Revisit Yields New Class of Future Physician Scientists

The results: The MD-PhD subcommittee on admissions reviewed 557 (64% men; 36% women) applications from undergraduates applying for admission to the MD-PhD Program starting medical school in 2007. Thirteen applicants (8 men; 5 women) accepted offers to matriculate at HMS: Joseph Bell (Harvard), Luciano Custo Greig (Yale), Wataru Ebina (Stanford), Gilad Evrony (MIT), Robert Koffie (Indiana University), Diane Shao (Rice U), Alexander Subtelny (Harvard), Kimberly Sue* (Columbia), Michael Xiang (MIT), Amy Xu (Harvard), Yanjia “Jason” Zhang (Yale). Note: David Konieczkowski (Princeton), who deferred admission from 2005-2006, will also matriculate in 2007. Two students deferred admissions until 2008: Vineeta Agarwala (Stanford) and Katie Lee (U of Minnesota). (*social science track.)
A Knight to Remember

Who could be better than Harry Potter, David Beckham, and Sir Paul McCartney? Why the other Sir Paul, Sir Paul Nurse that is.

Twenty-five lucky MD-PhD students had the chance to sit with the 2001 Nobel Laureate and current President of the Rockefeller for an informal lunch prior to his Leaders in Biomedicine talk entitled “The Great Ideas of Biology” on March 15. All in attendance were left with a message of hope and inspiration concerning their futures in science.

If anyone was expecting a stuffy British knight consumed by science, they were pleasantly surprised by the jovial Dr. Nurse who walked in wearing a sweater instead of a tie and easily fell into conversation with the students on topics varying from his time at Oxford to the state of scientific funding today to his becoming “Sir Paul.”

The most amusing story of the afternoon came when one of the students asked Dr. Nurse what it was like to be a knight. In the fashion of a great storyteller, he regaled us with the story of how, without even opening it he had misplaced the letter from the Queen’s offices informing him of his chance at knighthood. Out of the blue he received an official phone call asking him whether or not he would “accept the honor.” He then was forced to make the decision in only four hours, and in the truly humble fashion he demonstrated throughout his time with us, he revealed that he almost didn’t take it.

In the course of the hour, the conversation moved to more serious topics, one of them being the state of research funding today. In all seriousness, he gave all of the students a hopeful message, and told us that if we were good and this is what we really wanted to do, that we would make it.

He also talked about what he thought an MD-PhD student ought to focus on in a PhD when asked about translational research. He was very much in favor of the idea of an MD-PhD, but advised us that we might focus on medically oriented research instead of strict basic science.

After more stories about his own career path and his youth in England, the hour came to a close. Science is full of personalities, and we were treated to a meeting with one of the finest. It was a thrill to meet a scientist who has experienced what we all dream of and in the wake of it all has continued to care about doing science that will help people, teaching students, and forming science policy that will continue to fund work that is both elegant and for the good of mankind. We were left inspired and in awe of a true ambassador of Nobel and science.

—Sarah Hill, MD-PhD (HST) II
Students Travel to High Places

ONYI IWEALA attended the 13th International Congress of Mucosal Immunology: “Not All Quiet on the Frontline of Mucosal Immunology” this past July in Tokyo, Japan. She reports “It was an action packed meeting with presentations from many heavyweights from the field of mucosal immunology.

The meeting provided superb coverage of the field of mucosal immunology, including various sessions on the development of mucosally delivered vaccines, a newly emerging global strategy for improving vaccine efficacy and vaccine coverage. I had the opportunity to present some of my thesis work on the impact of parasitic helminth infections on the efficacy of oral vaccination.

Talks of note included a standing room only lecture by Maria Rescigno on role of intestinal epithelial cell and dendritic cell mediators in maintaining the immunologically tolerant environment in the GI tract in the face of constant exposure to microbial products and foreign dietary proteins; a lecture by T-regulatory cell maven Shimon Sakaguchi that introduced folate receptor 4 as a new marker for identifying activated T regulatory cells; and a lecture by Nobel Laureate Barry J. Marshall in which he described in detail his notorious self experiment—drinking H. pylori to induce gastritis in order to demonstrate that H. pylori was a pathogen and a causative agent of gastric ulcers.

EIGHT SECOND-YEAR MD-PhD students presented posters at the 22nd Annual MD-PhD Student Conference held July 27-29, 2007 in Keystone, Colorado hosted by the MSTP at the University of Colorado at Denver and Health Sciences. The conference offers a forum for MD-PhD students from around the country to share research, meet and hear distinguished speakers and enjoy the Rocky Mountains. This year’s featured speakers were Peter Agre, MD, Huda Zoghbi, MD, David Baltimore, PhD, Mark Saltzman, PhD, and Polly Matzinger, PhD. Students attending were Jonathan Abraham, Milena Andzelm, Cameron Sadegh, Erin, Chen, Yin Ren, Jenny Yang, Stephen Huffaker, and Karolina Maciag.
**PhDs completed**

**Milan Bajmoczi**, Cannon, **BBS-Biological Chemistry and Molecular Pharmacology** (DMS) at Harvard University. [David E. Golan, M.D., Ph.D.] Internalization of Pseudomonas aeruginosa by Non-polarized and Polarized Epithelial Cells: a CFTR- and Caveolin-1-dependent Process (5/07).

**Brinda Balakrishnan**, HST, **Medical Engineering and Medical Physics** at MIT. [Elazer R. Edelman, M.D., Ph.D.] Computational Modeling of Local Intravascular Drug Delivery (3/07).


**Adam A.L. Friedman**, HST, **BBS-Genetics** (DMS) at Harvard University. [Norbert Perrimon, Ph.D.] Genomic dissection of receptor tyrosine kinase activation of extracellular signal-regulated kinase in Drosophila (5/07).

**Lilit Garibyan**, Holmes, **BBS-Pathology** (DMS) at Harvard University. [Raif S. Geha, M.D.] The Role of TACI Mutations in Common Variable Immunodeficiency (7/07).

**Raj K. Gopal**, Castle, **Neuroscience** (DMS) at Harvard University. [Bruce A. Yankner, M.D., Ph.D.] Regulation of DNA Double-Strand Break Repair by Parkin (6/07).

**Clara Y. Han**, Holmes, **Medical Anthropology** at Harvard University. [Arthur M. Kleinman, M.D.] Life in Debt: Depression and Survival in Chile’s Market Democracy (5/07).

**Todd M. Herrington**, HST, **Neuroscience** (DMS) at Harvard University. [John A. Assad, Ph.D.] Attentional Shifts in Parietal Cortex and Behavior (6/07).

**Arindel S. Maharaj**, Peabody, **BBS-Pathology** (DMS) at Harvard University. [Patricia A. D’Amore, Ph.D.] Vascular Endothelial Growth Factor is Required for Vascular and Tissue Homeostasis (6/07).

**Anthony A. Philippakis**, HST, **Biophysics** at Harvard University. [Martha L. Bulyk, Ph.D.] An Integrated Computational Approach for the Determination of Metazoan Gis Regulatory Codes and Gis Regulatory Modules (5/07).

**Sashank K. Reddy**, HST, **Biophysics** at Harvard University. [Marc W. Kirschner, Ph.D.] Ubiquitination by the Anaphase-Promoting Complex Drives Spindle Checkpoint Inactivation (5/07).

**Daniel P. Seeburg**, HST, **Biology** at MIT. [Morgan H. Sheng, Ph.D.] The Role of Polo-like kinase 2 in Synaptic Function and Plasticity (5/07).

**Erica Seiguer**, Cannon, **Health Policy** at Harvard University. [Richard G. Frank, Ph.D.] Innovation and Incentives in Pharmaceutical Research and Development (5/07).

**Elizabeth H. Stover**, HST, **BBS-Genetics** (DMS) at Harvard University. [D. Gary Gilliland, M.D., Ph.D.] FIP1L1-PDGFalpha, a tyrosine kinase fusion protein involved in chronic eosinophilic leukemia (5/07).

**Marc N. Wein**, Holmes, **Immunology** (DMS) at Harvard University. [Laurie H. Glimcher, M.D.] Regulation of Immunobiology and Skeletal Biology by the Zinc Finger Adaptor Protein Schnurri-3 (6/07).


Jinushi M, Nakazaki Y, Dougan M, Carrasco DR, Mihm M, Dranoff G. MFG-E8-mediated uptake of apoptotic cells by APCs links the pro- and antiinflammatory activities of GM-CSF. J Clin Invest. 2007 Jun 7; [Epub ahead of print]


Hanna J, Finley D. A proteasome for all occasions. FEBS Lett. 2007 Mar 30; [Epub ahead of print]


Dougan M, Carrasco DR, Mihm M, Dranoff G. MFG-E8-mediated uptake of apoptotic cells by APCs links the pro- and antiinflammatory activities of GM-CSF. J Clin Invest. 2007 Jun 7; [Epub ahead of print]
For the Record

Class of 2007 Internship/Residency and Postgraduate Appointments

Andrew James Aguirre, Internal Medicine, Massachusetts General Hospital, Boston, MA.
Jakob Begun, Internal Medicine, Brigham and Women's Hospital, Boston, MA.
Irene Ann Chen, Bauer Fellow, Harvard Faculty of Arts & Sciences, Cambridge, MA.
David M. Cochran, Adult and Child Psychiatry Residency, University of Massachusetts, Memorial Medical Center, Worcester, MA.
Sophie Christine Currier, Pathology, Massachusetts General Hospital, Boston, MA.
Phillip A. Erwin, Internal Medicine, Massachusetts General Hospital, Boston, MA.
Jean-Marc Gauguet, Radiology, Beth Israel Deaconess Medical Center, Boston, MA.
Robert Stewart Griffin, Anesthesiology, Massachusetts General Hospital, Boston, MA.
Ashutosh Prabhakar Jadhav, Neurology, Massachusetts General Hospital, Boston, MA.
David Hyun Jung, Otolaryngology, Mass Eye and Ear Infirmary, Boston, MA.
Rita Khodosh, Dermatology, Stanford University Programs, Stanford, CA.
Andrew David Levin, Genzyme Corporation, Cambridge, MA.
Bradley John Molyneaux, Neurology, Massachusetts General Hospital, Boston, MA.
Sahar Nissim, Internal Medicine, Brigham and Women's Hospital, Boston, MA.

Michael Abram Ohliger, Radiology, UCSF, San Francisco, CA.
James Rhee, Anesthesiology, Massachusetts General Hospital, Boston, MA.
Douglas A. Robinson, Internal Medicine, Brigham and Women's Hospital, Boston, MA.
Safa Sadeghpour, Associate, McKinsey & Company, Florham Park, NJ.
Erica Seiguer, Internal Medicine, Massachusetts General Hospital, Boston, MA.
Jay Ashok Shendure, Assistant Professor of Genome Sciences, University of Washington, Seattle, WA.
Benjamin Daniel Sommers, Internal Medicine/Primary Care, Brigham and Women’s Hospital, Boston, MA.
David Yoshio Takeda, Internal Medicine, Brigham and Women’s Hospital, Boston, MA.
Jonathan Sidney Thierman, Emergency Medicine, Johns Hopkins Hospital, Baltimore, MD.
Vesselin T. Tomov, Internal Medicine, Hospital of University of Pennsylvania, Philadelphia, PA.
Griffin M. Weber, Chief Technology Officer, Harvard Medical School; Director of the Biomedical Informatics Core and Instructor in Medicine, Beth Israel Deaconess Medical Center, Boston, MA.
Ernest Nanjung Yeh, Radiology/Scholar Track, Beth Israel Deaconess Medical Center, Boston, MA.
Lisa Maher Zakhary, Psychiatry, Massachusetts General Hospital, Boston, MA.

visit our website at www.hms.harvard.edu/md_phd

Save the Date

25th Annual Student/Faculty Retreat
October 12-14, 2007
Waterville Valley Conference Center
Waterville Valley, New Hampshire

Weekend Highlight:
Eva Neer Memorial Lecture presented by Dr. Nancy C. Andrews, George Minot Professor of Pediatrics and Dean for Basic Sciences and Graduate Education at HMS – Title: “Serendipity”

The retreat includes research presentations by senior students, student/faculty poster session, panel discussions, recreational hikes, music and dancing.