And Cis regulatory modules, regulatory networks and expression programs.

Vascular Endothelial Growth Factor is Required for Vascular and Tissue Homeostasis.

Behavior.

Sine Kinase Activation of Extracellular Signal-Regulated Kinase in Drosophila.


Type 2 Diabetes.

Genomic Dissection of Receptor Tyrosine Kinase Activation of Extracellular Signal-Regulated Kinase in Drosophila.

The Role of Forkhead Transcription Factors in Hematopoiesis and Leukemogenesis.

Intrinsic and Extrinsic Regulation of the Anaphase-promoting complex.

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related peripheral tissue antigens in single thymic medullary epithelial cells.

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Gluconeogenesis as a System: Development of in vivo Flux Analysis of Hepatic Glucose Production in Type 2 Diabetes.

Internalization of Pseudomonas aeruginosa by Non-polarized and Polarized Epithelial Cells: a CFTR- and Caveolin-1-Dependent Process.

Advanced Analysis of Ubp6, a Proteasome-Associated Deubiquitinating Enzyme.

Attentional Shifts in Parietal Cortex and Behavior.

Intrinsic and Extrinsic Regulation of the Anaphase-promoting complex.

An Integrative Computational Analysis of Lipoprotein Receptors and Vascular Activity in Visual Cortex.

Targeting and Function of Mammalian MicroRNAs.
Welcome

Welcome to the M.D.-Ph.D. Program’s Annual Spring Dinner in honor of the M.D.-Ph.D. Class of 2009 at Harvard Medical School (HMS)! We are especially delighted to welcome the family members and significant others who are joining the graduates, faculty, students and staff to recognize our graduates tonight.

This year, twenty-three students will graduate from our program with both M.D. and Ph.D. degrees. This book showcases the accomplishments of all the individuals among this select group. Together, these students, who matriculated at HMS between 1997 and 2003, collectively spent about 289 years of academic study, including undergraduate and graduate degrees. While at Harvard they spent 8.30 years on average per student, to complete 23 Ph.D. degrees and 23 M.D. degrees.

This year’s class of six women and seventeen men reflects the diversity of graduate training available to M.D.-Ph.D. trainees at Harvard Medical School. In all, they carried out their graduate studies in 12 different programs located within Harvard University’s Graduate School of Arts & Sciences and the Massachusetts Institute of Technology. While the majority of students pursued their dissertations in the basic sciences, five of our graduates completed their dissertations within the MIT/HST Medical Engineering Medical Physics program and another completed her doctoral program in Mathematics and Medical Engineering at MIT.

Please spend a moment to read the individual biographies written by each of the students. Many spent their early years in cities and towns across the United States: Arizona, California, Connecticut, Hawaii, Illinois, Indiana, Louisiana, Maryland, Massachusetts, Mississippi, Missouri, New York, and Ohio. Other students have come from Armenia, China, Guam, India, Malaysia, Puerto Rico, Slovakia, Taiwan, and Trinidad. They went on to complete their undergraduate degrees at 18 different colleges and universities including Cal Tech, Cornell, Harvard, Johns Hopkins, Massachusetts Institute of Technology, Ohio State, Princeton, Rice, Stanford, SUNY at Stony Brook, UC-Berkeley, UC-Irvine, UCLA, University of Chicago, University of Illinois, University of Minnesota, Williams College, and Yale. While at HMS, 13 enrolled in the London Health Sciences and Technology (HST) curriculum, while 10 joined the New Pathway, representing all four different societies (4 Cannon, 2 Castle, 2 Holmes, and 2 Peabody).

While these students are meeting the joint challenges of graduate and medical study, the M.D.-Ph.D. Program endeavors to provide a nurturing and cohesive environment throughout the course of their studies. The program is fortunate to be able to provide financial support for the majority of the graduates under the sponsorship of the NIH-Medical Scientist Training Program (MSTP) Grant and other sources, and wish we could provide full funding for all. Participation by the graduates in our special courses, advising sessions, retreats, dinners, symposia, lunches, poster sessions and thousands of emails helped us to bring the diverse groups together in fulfilling our mission to “educate and inspire the leading physician-scientists of the future.”

We congratulate the 2009 graduates on their numerous achievements and accomplishments towards the completion of the M.D. and Ph.D. degrees and send our most heartfelt wishes for continued discovery, success and happiness into the future.

Best wishes,

The Students, Faculty, and Staff of the M.D.-Ph.D. Program

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HARVARD MEDICAL SCHOOL
ANNUAL SPRING DINNER IN HONOR OF THE

M.D.-Ph.D.
Class of 2009

JUNE 2, 2009
The Joseph B. Martin Conference Center

6:00 PM
Cocktail Reception
Classic Jazz by Tal Shalom-Kobi Trio

7:00 PM
Seating for Dinner
Director’s welcome and introduction of graduates and mentors
Dr. Stephen C. Blacklow

Dean’s Champagne Toast to the Graduates
Dr. Thomas Michel

Special Remarks
Dr. Stephen C. Blacklow
Ms. Linda Burnley

Graduate Speakers
Dr. Lilit Garibyan
Dr. Raj Kakkala Gopal
Dr. Vidyasagar Koduri

Formal Group Photo of Graduates (in dining room at conclusion of remarks)

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Key: BBS: Biological and Biomedical Sciences  
BCMP: Biological Chemistry and Molecular Pharmacology  
CDB: Cell and Developmental Biology  
HST: Health Sciences and Technology  
MEMP: Medical Engineering and Medical Physics  
MIT: Massachusetts Institute of Technology
Milan Bajmoczi

It’s been 17 years since that memorable morning when I boarded a train headed for Prague in my hometown of Kosice, Slovakia. The year was 1992. I was 17, and the echoes of Velvet Revolution of 1989 were still very much palpable in the fabric of our daily lives. For me, this meant a chance to travel to America for a year as an exchange student, a high school senior, to learn English and to experience the big world. Giddy with excitement, I only remember fractions of the conversation my parents and I shared that morning at the station. Mom believed, “He’ll be back in a year.” My father said, “Beata, last chance. If he leaves now, he won’t be back.” I flew from Prague the next day.

The big world shrunk fast as I arrived in Duluth, Minnesota. The cultural shock everyone warned me about set in, and I realized that not all of America is Hollywood and Times Square. Regardless, the six years I spent in Duluth were some of the best of my life, and I met many wonderful people there and also few memorable characters. After the exchange year, I entered University of Minnesota – Duluth, and in 1998, I graduated with a major in Biochemistry and Molecular Biology. I then set out on the second big trip of my life, and I moved to Boston to pursue my dual love for science and medicine.

I was fortunate to meet Dr. David Golan after just a couple of months, who over the ensuing (many) years became my mentor, my friend, and one of the most relevant people in my life. I was interested in infectious diseases, and so, in collaboration with Dr. Gerald Pier, we studied the biological mechanism of lung infections in patients with cystic fibrosis.

While my scientific fascination with infectious diseases remains strong, in clinical medicine it is the world of surgery that fascinates me the most. In July, I will begin yet another, although this time purely metaphorical, big trip of my life, when I move to Worcester, Massachusetts, to start my integrated vascular surgery residency at the University of Massachusetts Medical Center.

I have been blessed by many good people in my life, and my heartfelt thank you to all. I also want to specifically thank my parents and my partner, Corinna, for their love and support, my Ph.D. advisor, Dr. Golan, for his help and guidance, and the M.D.-Ph.D. program for its support and for giving me this opportunity.

José Orlando Alemán

There are bigger and better things after the MD-PhD, a young program director once reminded the entering class of students… The wisdom of those words gains relevance today as we celebrate our tortuous combined degree educations that end and the careers that start today. In my own case, at age 15, I met my first MD-PhD mentor at the University of Puerto Rico, and fell in love with the intellectual endeavor possible in applying the fruits of research to patient care. My peripatetic academic exile took me from Carolina, Puerto Rico to Ithaca, Madrid and eventually Boston via Harvard and MIT, from where I now emerge an eager physician-scientist.

Now we continue the next step of this journey with residency in internal medicine/endocrinology at Weill Cornell Medical Center in NYC, while my wife Tara moves on to faculty at Hunter College. We are saddened to leave Boston, but are also excited about the possibilities ahead. If indeed there are bigger and better things after the MD-PhD, I can’t wait to find out!!!
Yeang Howe Ch’ng

Born and raised in Malaysia, Yeang evinced an early interest in the biological sciences which was whetted by his year in America at the age of 6 as a first grader in Madison, WI, where he ran around marinating cockroaches in test tubes and randomly jamming wires into electrical sockets. Fortunately he returned to Malaysia mostly intact, where the next 12 years were spent negotiating the language-heavy curriculum of Malaysian primary and secondary education. After graduating from Chung Ling High School in Penang, he returned to the US as a freshman at Yale. There he majored in Biology and worked on red cell cytoskeletal proteins in the lab of JS Morrow, graduating summa cum laude with combined Bachelors/Masters degrees. He continued to the MD-PhD/New Pathway program at Harvard, working on two-photon imaging of neuronal and vascular activity in the visual cortex of anesthetized cats and rats with R. Clay Reid. There, he found that spontaneous activity in the visual cortex produces patterns that are informed by the functional properties of the same neurons. He also explored the relationship between neuronal activity and dynamic regulation of cerebral blood flow, a phenomenon which forms the basis of functional MRI. Over the same period, he nurtured a parallel interest in artistic imaging, namely photography which resulted in exhibits in New York, Paris, and the Smithsonian Natural History Museum in Washington, DC. He plans to complete the trifecta of imaging related pursuits by applying to radiology residency after a year of portrait and fine art photography as an intern with Schatz/Ornstein studios in New York.

Brinda Balakrishnan

I grew up in Southern California, as a shoe-loving, retail therapy indulging, classical Indian music singing, math and science nerd. Despite growing up in Upland, California, I spent my childhood day-dreaming about living in Boston, a dream inspired by my favorite movies, Good Will Hunting and With Honors. After graduating from Upland High School, I moved three time zones away to M.I.T., where I was instantly drawn to study Chemical Engineering. Because I had always wanted to become a doctor, I worried that being a chemical engineer might conflict with the pursuit of medicine. Under the mentorship of Elazer Edelman, I found a way to seamlessly combine engineering and medicine in the study of cardiovascular stents. After graduating from M.I.T., I joined Harvard Medical School’s HST program. Within the first year of medical school, I missed doing problem sets and manipulating equations, so I swiftly headed back to M.I.T. for a Ph.D. in Biomedical Engineering.

While I was investigating local drug delivery from cardiovascular stents, I found myself absorbed not only by the biology, engineering, and clinical aspects of my thesis, but I developed a curiosity for business issues. The experiences I had in medicine and engineering have taken me along an unconventional path. I am thrilled to be joining Genzyme in Cambridge, MA, as a business development manager, followed by joining McKinsey and Company in Palo Alto, CA. After more than a decade of bundling up for New England winters (and falls and springs), I am ready to return to the Golden State.

The past seven years of graduate school have been an incredibly enriching time in my life. I traveled to seven countries throughout Europe, Asia, and the South Pacific. I became a disciplined runner of the Charles River esplanade. And, most importantly I made friends with people who have taught me new ways of living. I have my friends and family to thank for all of the richness of my life. I am deeply grateful to my Ph.D advisor and mentor, Elazer Edelman, for his guidance. I thank my husband of one month, Adam, for being my confidant, travel buddy, and sounding board. Finally, I will never be able to thank my mom enough for how her choices, sacrifices, and support created abundance in my life.
Adam Amiel Laufer Friedman

I grew up in semi-rural Mississippi, with several acres of field and forest to explore after school and on weekends. This is probably where I developed my keen extreme survival skills, whereby I can be without the Internet for more than 30 minutes. The exposure to so much of wild nature is what made me so curious about the natural world in my biology classes in high school, and directly led me to spend much of my time during my undergraduate years at Princeton producing and acting in theater. I also majored in Molecular Biology and began my intense love of fruitflies.

Not being able to decide between medicine and science, I came to Boston to enter the HST/MD-PhD program at Harvard in 2001. I joined the lab of Norbert Perrimon to study signaling pathways underlying cell growth, development, and cancer, and was fortunate to be present during an exciting time of massive technological innovation at the beginning of Systems Biology approaches. We used functional genomics, and later proteomics, to screen for new regulators of these signaling pathways, leading to a more complicated and nuanced view of how cells process information.

I was able to get to this point in my career by being extremely fortunate to have the support of my friends and family. Along the way, I have been helped by the HST administration and several mentors, most notably Dick Maas. My clinical training will begin with residency at Boston Children’s Hospital in pediatrics and then likely hematology/oncology fellowship, while I continue research on the signaling underlying cancer development and molecular diagnostics. I would also like to point out that the Red Sox have won two championships during my tenure here, a fact which cannot be coincidence.

Kyle Kai-How Farh

I grew up moving back and forth between Taiwan, Indiana, Louisiana, and Hong Kong. My sister and I naturally grew up sensitive to the cultural differences in the way people perceived themselves and the world. Growing up between different cultures, I first became interested in questions of nature vs nurture, and the complementary role that intrinsic and environmental factors play in creating who we are.

At Rice University, I majored in computer science, then worked out in Silicon Valley during the era of the dot com boom-bust. I later applied my computational training to the vast amounts of newly minted genomic information to understand the programs used by living systems. During my preclinical years in HST, I worked in Todd Golub’s lab, analyzing patterns of gene expression in cancer versus normal cells. During my PhD in Biology at MIT, I worked in David Bartel’s lab, where my collaborators and I made great progress towards understanding one small piece of the puzzle, gene regulation by endogenous small non-coding RNAs called microRNAs.

I have become increasingly interested in how our genes give rise to human disease and human variation. Reflecting on my turning 30 this year, I realize that from an evolutionary standpoint, many of the most important events in selection—surviving the high mortality of childhood disease that has been such a huge burden throughout much of human history, growth and nutrition, mate selection and reproduction, battles and trauma, learning and teaching—the bulk of these have already passed you by, by the time you have reached early-to-mid adulthood. Being a survivor of these tumultuous decades myself, and given my interest in the genetic basis of human disease and development and my clinical interest in serving this patient population, I naturally felt that my next step was to pursue a residency in pediatrics, which I will begin this summer at Children’s Hospital next door.

These last 7 years have been quite the ever-changing adventure for me, highlighted by the kind support of family and friends, many of whom I can count among the MD/PhD program community. Thank you for being there for me through all the ups and downs.
Lilit Garibyan

I was born in Yerevan, Armenia where I spent the first twelve years of my life. My parents decide to leave Armenia in 1991 to secure better future for their kids. In 1991, when my family and I immigrated to the US from Armenia, we did not speak any English, nor did we have a roadmap to guide us through the first steps of our new life. At age twelve, standing on new soil, I had to start from learning the English alphabet. However, despite all the challenges, thanks to the wonderful opportunities provided by this country, I was given the chance to pursue what I love.

After learning English and graduating from high school, I was accepted to UCLA. I was at UCLA that I learned the value and excitement of creating new knowledge through basic science research. It was during college that I had the good fortune of meeting physician scientist mentors who inspired me to follow in their footsteps. I was fortunate to get accepted to Harvard and many other great MD-PhD programs, and despite my mother’s plea to stay close to home I decided to take on the challenge, move 3,000 miles away from my family, and come to Harvard. Coming here was one of the best decisions I ever made. Throughout my MD-PhD training, the experiences I have had, people and friends I have met, and the lessons I have learned not only in science but in life, are invaluable to me. It was here that I also met my wonderful husband.

I did my PhD training in the laboratory of Dr. Raif Geha studying common variable immunodeficiency disease. Dr. Geha served as a true mentor to me, always looking out for my best interest and for that I am greatly indebted to him.

My journey thus far has been both enjoyable and challenging but it does not stop here. I will continue my lifelong dedication to learning, research, patient care, and teaching by first pursuing a residency in dermatology at Harvard’s combined Dermatology program. In the future, I hope to become an academic dermatologist to serve the country and the people that have given me every opportunity imaginable. I would like to thank my family, my husband and his family, my friends, my mentors and the MD-PhD program, especially Linda Burnley, for all their love, support, patience and encouragement throughout my training. I could not have done it without them. I also would like to thank everyone who ever believed in me and gave the opportunities in life that I would not have even dreamed of.

Georg Kurt Gerber

I come from a place called Van Nuys in the Valley of San Fernando, known for its arid soil and sorrowful ants. There, I attended school sporadically and worked on various business ventures with my brother. I graduated from UC Berkeley, where I researched mathematical models of the immune system and received a BA in Mathematics and an MPH in Infectious Diseases. During my last year at Berkeley, I started a company that developed 3D graphics software, which I later sold to L-Squared Entertainment, where I subsequently worked as a Senior Vice President distilling dreams through production of IMAX and feature films.

In 2000, I returned to academia through the HST MEMP program and the Computer Science Department at MIT. There, I met Professor David Gifford, who has now been a mentor and friend for almost nine years, impressing me with his scientific curiosity, entrepreneurial spirit, and prodigious appetite for authentically interdisciplinary research. My PhD thesis focused on novel machine learning methods for inferring gene expression programs and regulatory networks from high-throughput biological data.

I’ll be doing my residency in Clinical Pathology at the Brigham, an ideal environment to continue pursuing my interests in using computers to understand high-throughput data, especially that related to immunology/infectious diseases. There are many I’d like to thank, but space is inelastic, and I can only mention my co-advisors Professors Jaakkola and Young, my family and my wife, Anne-Marie, who I met in a now distant November in a place closer to Van Nuys.
Brian Palmer Hafler

I grew up in Newton, a suburb of Boston and have always been fascinated with scientific research. As a child, I remember visiting my father’s laboratory and looking at a drop of blood under the microscope and seeing white blood cells swimming around. This experience excited me and made me want to consider pursuing scientific research. My first introduction to laboratory research came during high school when I worked with Dr. Vijay Kuchroo at Harvard Medical School studying the mechanism by which altered peptide ligands prevent experimental autoimmune encephalitis. Dr. Kuchroo was a supportive mentor whose enthusiasm for science and teaching confirmed my desire to be a scientist. After graduating from the Roxbury Latin School, I matriculated at Princeton University where I was fortunate to work with Dr. Eric Wieschaus. Dr. Wieschaus taught me a basic foundation in developmental neurobiology; the lessons of which I still apply every day. After entering the MD/PhD program at Harvard Medical School, I performed my dissertation research with Dr. David Rowitch where I studied transcriptional regulation of Olig2 during motor neuron differentiation. This research excited me because it addressed issues in mammals related to regrowth and repair of neural elements destroyed in neurologic diseases. Dr. Rowitch was a model physician-scientist and a paradigm of how I would like to perform translational science in the future.

In the MD/PhD and HST programs I have been fortunate to have had the support from a number of people. My HST advisor, Dr. Andrew Lichtman, Dr. Christopher Walsh, Dr. Richard Mitchell, Linda Burnley, and Patricia Cunningham all helped provide support along the way and without whom I would not be here today. I am also deeply grateful to my current laboratory advisor, Dr. Constance Cepko and am excited to continue my research with her next year.

Finally, I am forever grateful to my family. Jason, you are a very special person who has given me laughs, perspective, and the best friendship I have ever had. I am so lucky to have you as a brother. Mom and Dad, you have always encouraged me to follow my dreams. I could not have done any of this without your constant love, dedication, and support.
John William Hanna

One of the most remarkable aspects of society, as our former Poet Laureate Robert Pinsky once pointed out, is that the knowledge gained and the progress made by one generation is passed on to the next. When I was younger, it struck me as almost miraculous that this should be the case — that I and all the other children I played with could run the day-to-day business of life. It is only now that I am starting to appreciate how this everyday miracle takes place. As a child, it was my parents who spared neither time nor expense in my education. They sent me to the St. Louis Priory, where I studied two dead languages, and to Stanford, where I picked up a third. I also studied some science, and it was there that two professors introduced me to a problem that I admit I hadn’t even anticipated, which is that cells sometimes have to destroy their own proteins. At Harvard, I am impossibly indebted to Daniel Finley with whom I have shared real joy in discovery and satisfaction in doing science. Most of the other amazing things I have learned here in Boston have come from Mauro Zappaterra, Sashank Reddy, Daniel Seeburg, Adam Friedman, and Mike Feldstein. So if Pinsky’s observation seems to me now somewhat more plausible, it is, nonetheless, even more remarkable.

Todd Michael Herrington

I was born and raised in Southern California. I then moved northward to Stanford University where I, somewhat by happenstance, fell into doing research on an obscure soil bacterium. There I quickly learned how interesting questions arise from unexpected places and witnessed how fulfilling an investigative career could be. I soon developed a fascination with neurobiology that became the focus of my career. After graduating from college I briefly did research on, of all things, Botox. Young and still 100% naturally wrinkle free, I moved to Boston in 2000 to start my MD-PhD.

I completed my dissertation with John Assad in the Department of Neurobiology studying the neural mechanisms underlying our ability to focus attention. In John I found a mentor who was brilliant, enthusiastic, unflaggingly supportive, and a model family man — a rare combination in any walk of life. Next year I’ll be starting my Internal Medicine Internship at Massachusetts General Hospital followed by Residency in Neurology at Partners.

My time here has been a time of great personal challenge and growth facilitated by the wonderful faculty and staff that have put their everything into the MD-PhD program. Nine years later I count among my closest friends the ones I made in the very first days of the program. But my biggest thanks go to my family and my wonderful wife whose love and support are the foundation of all my accomplishments, past, present, and future.
Kevin Robert King

I grew up on the south side of Chicago, the oldest of three brothers. Sports and music were the centerpieces of life, and it was not until late high school that I first discovered the love for math and science that lead me to study electrical engineering at the University of Illinois at Urbana-Champaign. During college, I thoroughly enjoyed discovering “how things work.” However, once I had the opportunity to use my knowledge of physics and chemistry to design new things in David Beebe’s lab, I was hooked. Bioengineering research was the place for me. After graduation, I spent a brief year doing research at the NASA Jet Propulsion Lab, and then began graduate school in electrical and bioengineering at MIT with my eyes set on an academic career.

At MIT, my focus gradually shifted from technology development to investigation of basic science. I did master’s and doctoral research under the guidance of Mehmet Toner, Martin Yarmush, Jeff Borenstein, and Joseph Vacanti, using microtechnology to study gene expression patterns in the liver during inflammatory and innate immune responses. During this time, I also learned about the unique rewards of direct patient care, and transferred to the HST MD program to complete my clinical training. My time in Boston also offered me the opportunity to pick up my new favorite hobbies, long distance running and triathlon. (the picture of my slightly dehydrated self with my brothers was taken at mile 62 of the Western States 100 ultramarathon).

In June I will start internal medicine residency at Stanford University Hospital with the long-term goal of pursuing a career in academic cardiology. I am grateful to my wonderfully supportive mentors, friends, and family, and I am thankful to have had the opportunity to train in the outstanding forward-thinking HST programs at Harvard and MIT. I admit that I am looking forward to endless days of California sun, however I will miss those quiet reflective evenings running around the Charles. More importantly, I will miss my MIT and Harvard family.

Vidyasagar Koduri

I was born in 1976 in Chicago. My parents, Prasad Rao and Anuradha Koduri, are physicians from India, who emigrated to the US in the 1970’s. Strong early indicators of a future career as a physician scientist include the times I stuck a car key into an electrical socket, pulled a fake rubber plant down onto myself, a photograph of me reading JAMA at age 3, albeit upside down (the pictures were better that way!), and dressed up (thanks, Mom!) as an Archaeopteryx for the school Halloween Pageant.

When I was 12, my family moved to India, and I fell in love with cricket, mangoes and the heat, dust and light of Hyderabad. Through Maxwell’s Equations, I felt the wonder of science. But it was my encounter with the power of startling poverty and disease to utterly warp lives, that led me to also plan a career in medicine. I majored in Biological Chemistry at Chicago and learned to love the Great Books before spending a year at Cambridge University, enjoying rambling discussions about all sorts of science, always in a dark pub with a warm glass of ale at my elbow.

At HMS, in working with my graduate advisor, Steve Blacklow, I have taken the first steps towards becoming a professional scientist. And equally as important, I have had the privilege of learning to care for patients, to hear their tales, and to enter as wholly as possible into their lives. In the lab, the clinic, and the field, I have found my calling, and rich depth to strike in. It is a joy to do so with beloved friends—who have taught me about everything from siRNA to salsa—and beloved family, who years later, are ever-ready to pull my fingers out of electrical sockets or me from under rubber trees, turn magazines the right way up, and make fossil bird costumes at a moment’s notice.
Anthony A. Philippakis

Since beginning medical school, I have been fascinated by the human genome and its role in biology and disease. How does the genome encode the information for constructing an entire organism from a single cell? How do subtle variations in genomic sequence contribute to the risk for disease? Can we utilize these variations for clinical decision-making? These are questions that have intrigued me throughout my time as a medical student, and which I hope to continue researching as I become a physician-scientist.

Before beginning medical school, I completed a Master’s degree at Cambridge University in Mathematics. I entered Harvard Medical School in 2001, just as the sequencing of the human genome was nearing its completion, and I was excited by the chance to apply my quantitative background to the new and expanding field of genomics. I joined the MD-PhD program as a second-cycle student, and I did my PhD in the lab of Dr. Martha Bulyk where I worked on developing new algorithms and technologies for identifying regulatory regions in the human, mouse, and fruit-fly genomes. I was the first graduate student in my advisor’s lab, and the chance to begin a new project, in a new lab, and in a new field was an ideal fit for an independent person like me! I fondly remember downloading each new “draft” version of the human genome as it was released, and being among the first wave of researchers trying to analyze it.

I have thoroughly enjoyed my time as an MD-PhD student, and I am grateful for the opportunity to have had such rigorous training in both clinical medicine and basic research. Looking forward, I will begin a residency in Internal Medicine at Brigham and Women’s Hospital this summer, with a likely focus on Medical Genetics. As we move into an era where it will become possible to quickly and cheaply sequence individual genomes, I am excited by the prospects for utilizing common genetic variation to guide the clinical management of patients. This is an ideal mix of my research and clinical training thus far, and I look forward to a career in this field.

Arindel S.R. Maharaj

I was born and raised for the first half of my life in Trinidad, where my upbringing in the countryside fostered my curiosity in science, while experiences with my family made me realize the importance of helping others. I thus decided in my teens that medicine would allow me to fulfill both interests, so I undertook an adventure to move to the US, alone, to pursue my final years of high school. It was in high school here that I experienced cutting edge research for the first time, and I learned that I could pursue scientific investigations as a physician as well.

During my MD-PhD training here I completed my dissertation in the lab of Patricia D’Amore at the Schepens Eye Research Institute to elucidate the mechanism of the vascular endothelial growth factor in blood vessel stability. My time at Schepens made me interested in the field of ophthalmology. I am excited to begin my training in ophthalmology at Baylor after graduation, and use my training to pursue further research into the mechanisms of ocular vascular disease. Furthermore, I hope to do some international work, particularly in the Caribbean.

I am also proud that during my eight years at Harvard, I met great friends and mentors and picked up many new hobbies including sailing, scuba diving and golf. I’ve also mentored many young students along the way. Moreover, I met and married my wife Vissy Maharaj and have just had my first son, Deven Maharaj.

While it is bittersweet for me to leave the Harvard community, I’m looking forward to training near my family in Houston. I’m thankful for the tremendous support of my family, mentors, friends, my wife, and Deven for letting me get some sleep during my final year of medical school.

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Sashank K. Reddy

“Post-this, post-that, post-the-other, yet in the end not past a thing...” These words from Seamus Heaney have been echoing in my head as I contemplate the end of a wonderful journey through the MD-PhD program and my next leap into the unknown. The last eight years have seen a series of discontinuous steps from preclinical training to doctoral research to clinical clerkships. The journey has been one in which “each point of arrival”—to again quote Heaney—“turned out to be a stepping stone rather than a destination.” With each step forward, I’ve come to a new point of knowledge and self-knowledge for which I am enormously grateful. I’ve learned that no matter how far one has come before, the next step is a new challenge and past success is no guarantee of the future.

On this journey I’ve been blessed with the support of family, friends, and teachers. My loving grandmother and parents literally bolstered my first steps and have been guiding me ever since. My mentor Marc Kirschner helped me grow from a student who liked science into a mature, independent scientist. And my friends and fiancée who took this journey with me have contributed immeasurably to my personal growth. These and so many other remarkable people are the legacy I value most from the last eight years. Our mutual good wishes and good counsel sustain me as I prepare to take the biggest step to date, the one from school to life.

Lakshminarayan Srinivasan

I’ve had an amazing time in Boston. In 2002, I came to the northeast from Caltech. Over the intervening years, I’ve come to love swimming in the river of ideas that is Boston—an immense, unique confluence of schools, and ideas, and people. MIT campus and Cambridgeport were my playgrounds, where I could run into graduate students in Brain and Cognitive Science on the basketball court to discuss the brain, or explore technical issues behind stochastic control on my way to salsa dancing with friends in Electrical Engineering and Computer Science. Over the Longfellow Bridge, Massachusetts General Hospital shaped my approach to research in the clinical environment. To all of my research and clinical teachers, I thank you deeply for your mentorship. I greatly appreciated the guidance of Sanjoy Mitter at MIT’s Laboratory for Information and Decision Systems and Emad Eskandar at MGH Neurosurgery during my PhD and postdoctoral years respectively. To my friends in Boston, I will miss you all. To my parents Uma and Rengaswamy, and my brother Shyam, thank you for your unwavering support. With these experiences, I look confidently to the many interesting challenges ahead at the interface between neuroscience, engineering, and medicine.
Zuzana Tothova

When I first came to the United States as an exchange student in high-school, I would have never even guessed that I would be writing this, twelve years later. I was born and grew up in Slovakia as the youngest daughter of two academic physicists, who instilled a love of people and intellectual curiosity in their children. Faced with a decision to enter medical school in Slovakia or pursue my education in the United States, I matriculated at Williams College. Anyone who knows me well could probably tell you that I cannot stop talking about Williams. It is a very special place and offered time of unprecedented joy, challenge, and personal growth in my life.

As a first year medical student at Harvard, I was incredibly lucky to meet Dr. Gary Gilliland, whose laboratory I joined for my PhD to study a group of regulatory proteins called forkhead transcription factors. These proteins turned out to be incredibly important in keeping our blood stem cells healthy. I thank Gary for being a true inspiration, role model, mentor and a friend all along. He has taught me how amazing a moment of discovery can feel like and always reminded me of the most important goal guiding our work— to apply our discoveries to help patients.

Above all, I am deeply thankful to my family and friends whose unconditional love and support have made it possible for me to follow my dreams and set on the path of becoming a physician-scientist. I am excited beyond words to start residency in internal medicine at the Brigham and Women’s Hospital with a wonderful group of fellow MD/PhD classmates by my side.

Elizabeth Harmon Stover

I grew up in Columbus, Ohio, and still consider myself a Buckeye at heart. My first introduction to science was the 7th grade science fair when I studied earthworms’ response to light and dark (thanks to my long-suffering parents, who put up with a smelly fish tank full of dirt and worms). In high school I worked in my first real lab at Ohio State, studying a bacterial pathogen of corn—in the same plant pathology department where my great-great grandfather had been a professor.

I came East to college at Harvard in 1996, and have enjoyed living in Boston ever since, except for two absences. I took a semester off in college to work on a study of cancer in the Ohio Amish. The enjoyment I found in meeting these fascinating people was one of the experiences that drew me to medicine, which allows us the privilege of getting to know many interesting patients and hearing their stories. My second departure from Boston was a fantastic year in Cambridge, England after college, filled with a bit of research and a lot of traveling… and, importantly, meeting my husband, Roope.

My years in the MD-PhD program have been challenging but also interesting and rewarding. I enjoyed my medical school classes in HST and the unforgettable experiences of rotations on the wards, from witnessing cardiac surgery to delivering babies. I was fortunate to do my PhD in the lab of Dr. Gary Gilliland, an extremely supportive mentor who exemplifies the career of a physician-scientist. My PhD work focused on a tyrosine kinase fusion protein, FIP1L1-PDGFRA, which causes eosinophilic leukemia. I also studied the role of the hedgehog signaling pathway in hematopoiesis. I thank my talented lab-mates who made it fun to come to work every day (well, most days…).

After graduation, I will be starting residency in internal medicine at Brigham and Women’s Hospital. I would like to thank the faculty and staff of HMS, HST, BBS, and the MD-PhD program for their support over the past eight years, and my classmates and friends for many memorable moments. Finally and most importantly, I would like to thank my family. My parents and brother have been a constant source of encouragement, love, and advice throughout this long journey. And Roope has helped me to keep perspective on the important things in life: family, sleep, dessert, and the Red Sox. Together we recently had the joy of welcoming into the world our daughter Linnea, born March 30. We look forward to the coming years of watching her grow and learn.
Marc Nathan Wein

I was born in Cheshire, CT, right on the border of Yankees and Red Sox country. Naturally, I became a lifelong Mets fan. My dreams of pitching for the Mets were cut short after giving up the longest home run in the history of my high school baseball team. Luckily, when I was in college at Yale, I discovered that I was better suited to a life in biomedical sciences anyway.

Thinking back about the past 7 years, it’s amazing how the world has changed. I’ll always associate my time as an MD/PhD student here with the buildup to the Iraq war, the Red Sox finally winning a World Series, John Kerry losing the 2004 election, Hurricane Katrina, the collapse of Lehman Brothers, and Barack Obama winning the 2008 election.

I am extremely grateful to my mentor and thesis advisor Laurie Glimcher. Beyond unconditionally supporting our unexpected foray into skeletal biology, it was in her laboratory where I met my wife Sara Schoenfeld. Returning to medical school was hard, but would have been nearly impossible without Sara’s support.

Now, I’m awaiting the start of internal medicine residency at MGH with anxiety and excitement. I know that with the excellent training in science and medicine I received here, and the support of friends and family, I’m well prepared for all that lies ahead.

Jennifer Villaseñor

I was born on the island of Guam and, although it provided ample opportunities for visits to the beach, my parents thought that California would offer more educational opportunities. While in California, my summers were spent in various research labs in Riverside, Des Moines, and San Francisco, each one focusing on different areas in science. It was not until college where I found my niche. I was fortunate to work in the laboratory of Dr. James Allison investigating the role of the immune system in a mouse model of melanoma and became fascinated by immunology. I developed this interest at the National Institutes of Health where I worked with an excellent mentor, Dr. Ron Germain, presented my work to some of the best immunologists in the world, including Dr. William Paul, and met incredible role models like Drs. Francis Collins and Anthony Fauci.

When I was accepted to HMS, I knew I wanted to work in the laboratory of Drs. Diane Mathis and Christophe Benoist. Working in their laboratory has left an indelible mark on my career and my life. Not only are they incredible scientific mentors, their monthly wine tasting events and dinners at great restaurants with graduate students have improved my palette and enabled me to sample some of the best cuisine Boston has to offer.

The years I’ve spent completing my MD-PhD have been some of the most memorable, challenging, and rewarding years of my life. During this time, I’ve had the opportunity to work with some of the best scientists and clinicians and learn about some of the most amazing scientific discoveries by the people who made them. I formed great friendships, learned how to play golf, salsa, cook crème brûlée and Korean food, hiked all over New Hampshire, participated in a half-marathon and I found my future husband, Jim Park. I am extremely grateful for the support of my parents, sister, fiancé, and friends, who have all made the journey a little easier.

Upon graduation, I will continue my training in Dermatology. Looking forward to the next chapter of my life, I am filled with some anxiety. But, I am comforted knowing that I will take with me all the experience and knowledge I gained while at HMS.
Shannon Christine Wieland

According to my mother, I decided to become a doctor when I was three upon learning that the profession was open to girls. My other major childhood goals were to have 14 children and to take an oath of poverty that included living in a small hut. In high school, I discovered the clarity, logic, and creativity of math, which altered my plans to include a PhD in the subject. Along the way, I met my husband, Aaron, during my second-year neuroanatomy class. I was so impressed by his facility at a multiheaded microscope and his dancing in the second-year show that I acquiesced to his sober conditions of an apartment in Jamaica Plain, and no more children than fit into a Honda Civic. After graduation I will be taking a career hiatus to raise our two daughters through their formative years while Aaron finishes his residency. I will also be doing a part-time post-doc. Ultimately I would like to have more children than fit into a Honda Civic. After graduation I will be taking a career

I am indebted to many other people who have been my mentors, benefactors, and friends, including my PhD advisors Bonnie Berger and Ken Mandl, my undergradu-

I am thankful for the support of my parents throughout my ten years at Harvard and MIT, and for the multitude of sacrifices they have made throughout my life. Most recently, my mother and step-mother took turns living in Boston to take care of my kids while I finished my clinical rotations. I am also thankful for the support of my husband, and for the joy and purpose my daughters add to my life. I am indebted to many other people who have been my mentors, benefactors, and friends, including my PhD advisors Bonnie Berger and Ken Mandl, my undergraduate advisor Sherwin Singer, Nancy Andrews, Stephen Blacklow, Gordon Strewler, Jia Li, and my daughters’ day care providers.
The Role of TACI Mutations in Common Variable Immunodeficiency

Computational Discovery of Gene Modules, Regulatory Networks and Expression Programs

Regulation of DNA Double-Strand Break Repair by Parkin

Transcriptional Regulation of Olig2 in Motor Neuron Development

Functional Analysis of Ubiquitin-Proteasome-Associated Deubiquitinating Enzyme

Attentional Shifts in Parietal Cortex and Behavior

High-Throughput Microfluidic Living Cell Arrays for TargeTing and FuncTion oF MaMMalian Mi-crornas

Folding and Maturation of lipoprotein receptors

FIP1L1-PDGFRalpha, a Tyrosine Kinase Fusion Protein Involved in Chronic Eosinophilic Leukemia

Spatiotemporal Gene Expression Profiling

Enzyme Kin...
ABOVE: Participants gather for the traditional group photo at the 27th annual M.D.-Ph.D. Program Retreat held at Waterville Valley, NH, in October, 2008.

LEFT: Lakshminarayanan Srinivasan (front left) and Jose Alaman, (front right) enjoy a moment at the retreat with their M.D.-Ph.D. classmates Hannah Chang (center), and Ilya Leskov (back left) and Salil Garg (back right).

LOWER LEFT: Linda Burnley and Milan Bajmoczi on the retreat dance floor.

CENTER: HST current co-director, Dr. David Cohen, and Dr. Joseph Bonventre, past co-director, at the retreat. Both are graduates of the program.

LOWER RIGHT: Vidyasagar Koduri and Dr. Steve Blacklow on the day of Sager’s Ph.D. defense.