Summer 2004

The Connector

newsletter for graduates, students, faculty and friends of the Harvard-MIT Division of Health Sciences and Technology

Alumnus is astronaut candidate

Robert L. Satcher, Jr., MD '94, PhD (MIT '93) is one of 11 members chosen for NASA's 2004 Astronaut Candidate Class. He will begin training this summer as a mission specialist, and will use his expertise in orthopedic surgery and chemical engineering to study bone loss in microgravity situations.

Satcher, who was selected from about 2000 applicants, said HST provided the foundation that shaped his approach to learning and practicing medicine.

"HST is all about combining medicine with technology," he said. "It was an excellent preparation for a career as a clinical scientist. I hope to continue this tradition by looking for ways to further the use of medicine and technology for the advancement of space exploration."

NASA/Johnson Space Center

Robert L. Satcher, Jr. will begin his astronaut training this summer.

Satcher is an orthopedic surgeon at Northwestern Memorial Hospital and Children's Memorial Hospital in Chicago, specializing in child and adult orthopedic oncology. He is Assistant Professor of Orthopedic Surgery at Northwestern University's Feinberg School of Medicine, and also has a research position at the school's Robert H. Lurie Comprehensive Cancer Center and Institute for Bioengineering and Nanoscience in Advanced Medicine.

NASA introduced the new class during a Space Day celebration on May 6 at the National Air and Space Museum's Steven F. Udvar-Hazy Center in Chantilly, Virginia. According to a NASA press release, Satcher's class is the first to focus—from the very beginning—on the Agency's "Vision for Space Exploration," which looks at issues that will arise from long-duration space flight. The candidates will report to NASA's Johnson Space Center this summer. Once settled in Houston, they will begin the intensive training. Initially, they will undergo land survival training, T-38 jet ground and flight training, Shuttle orbiter systems training, Space Station systems training, science and engineering briefings, and orientation tours at all NASA centers, including the Kennedy Space Center and Marshall Space Flight Center.

Satcher and his wife, D'Juanna Satcher, MD (HMS '90, MIT '86), a pediatrician at the University of Chicago Hospitals, are the proud parents of a daughter, born on April 28. They live in Oak Park, Ill.

Daley speaks on stem cell research at HST Forum

In his keynote address, HST alumnus George Q. Daley (PhD '89, MD '91) gave the audience at the 17th annual HST Forum a glimpse of what the future of medicine may very well be.

HST Director Martha L. Gray, PhD '86 welcomed the audience at the Harvard Club in Boston on March 18. Introducing Daley was Irving M. London, MD, founding director of HST and professor emeritus at HST, MIT and HMS. London, who has collaborated with Daley on research and teaching, reviewed Daley's career and many contributions to science and to HST as a teacher, investigator, clinician and mentor.

Ralph Lindenfield

HST alumnus George Q. Daley was the keynote speaker at the 17th annual HST Forum.

The HST faculty member and Associate Professor of Biological Chemistry and Molecular Pharmacology at HMS reviewed 13 years of work to establish the potential of regenerative medicine through use of specific tissue cultures derived from multipotent embryonic stem cells. He emphasized his own work with murine hematopoietic stem cells. Diseases likely to respond to this approach include Parkinson's disease, Type 1 diabetes, and disorders of the bone marrow. The use of genetically matched cells might avoid

(continues on page 7)

Graduates meet to create new Alumni Council

Immediately following the March 18 HST Forum, 16 HST alumni gathered for a dinner meeting to plan the formation of the HST Alumni Council.

Chaired by Ed Cheal, PhD '86 and David Goodman, MD '93, the group came up with the following tasks:

- To help build a vibrant program to strengthen the ties between alumni and the HST faculty, students and administrators.
- To facilitate alumni-student interaction

(continues on page 12)

Congratulations to the new HST graduates!

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See pages 4-6 for a complete list of the Class of 2004.

HST News

BEP student and teammates win $50K competition

H. Hocking Cheng (BEP '05) and his Active Joint Brace teammates were selected as the Grand Prize winner at the 15th annual MIT $50K Entrepreneurship Competition on May 13. They received $30,000; the two runners-up each received $10,000.

Active Joint Brace (AJB) is an electromechanical orthotic device that increases functional independence by working in tandem with existing muscles. It is a portable, low-cost, non-invasive device that helps an individual perform activities of daily living. AJB is designed for the 10 million Americans with disabilities that have difficulty lifting light objects and need help with daily activities. This is the sixth year in a row that a medically based team has won this prestigious award.

Admissions enjoy successful season

HST had another excellent admissions cycle, marked by an increase in the number and quality of applicants.

The MD Admissions Committee received 570 applications and interviewed 145 applicants. Of those, 19 women and 25 men were offered admission. Four students, who deferred from previous years, will also be matriculating in September. The Class of 2008 will include a Rhodes Scholar, a Churchill Scholar and a Fulbright Scholar.

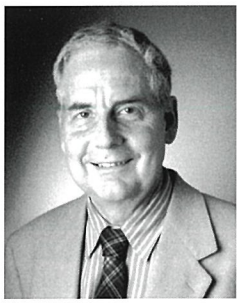
For the second year in a row, overall numbers of PhD applications were up by more than 10 percent. A good deal of that growth was in two discrete areas: MEMP with specific interest in the Bioinformatics and Integrative Genomics track, and the Speech and Hearing Bioscience and Technology program. Once again, the yield has been high for MEMP. The PhD Committee made offers to 28 candidates, including two candidates who are currently HST MD candidates. Twenty-one of those 28 offers have been accepted; matriculants include seven of the Committee's 10 top candidates.

The Biomedical Enterprise Program had a 75 percent increase in applications over last year. Sixteen of the 26 applicants were interviewed, with nine offered admission. Six offers have been accepted so far.

Posthumously published novel charms old fans, new readers

The works of Thomas A. McMahon, PhD are still being published, even though it has been five years since his untimely death at age 55.

The New York Times on March 21 reviewed a recently discovered and newly published novella, *Ira Foxglove*, which is about a Boston science teacher/inventor, his wife, her lover, and a tomato.



Thomas A. McMahon

Excerpt from the review: "This may be an early work, set aside for who knows what reason, but it has the same loopy charm and rueful insight as McMahon's previously published fiction (all of which has recently been reissued by the University of Chicago Press). For those who are already fans of McMahon, *Ira Foxglove* will be a chance to have one last little adventure in his company; for those new to his work, it makes a nice introduction to the bustling, more densely populated novels that have already earned him a small but devoted following."

In addition to being a prolific and productive scientist, a few may remember he also wrote *McKay's Bees*, a novel featuring imaginary scientific discoveries and named after the man whose name graces his professorship, Gordon McKay. He also wrote two other novels during his career, *Principles of American Nuclear Chemistry* (1970) and *Loving Little Egypt* (1987), which won an award from the American Academy of Arts and Letters.

The late HST affiliated faculty and Harvard professor of applied mechanics and biology is remembered for his key contributions to several courses and exemplary mentoring of students. (He received the Irving M. London Teaching Award in 1999). He also made stellar contributions to biomechanics, focusing on human locomotion, designing Harvard's running track, and explaining how the basilisk (or Jesus Christ) lizard can walk on water.

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HST News

BEP STUDENT WAS FINALIST IN 2004 VENTURE BOWL

Biomedical Enterprise Program student **Richard Wehby's** start-up company was one of 12 finalists in the 2004 Venture Bowl. His company, Hestion Corp., was founded by an exclusive license to MIT-developed technology that imparts permanent anti-microbial property to any material. Sponsored by the National Institute for Entrepreneurship, Venture Bowl is the nation's largest college business plan competition.

PROMOTIONS

Kenneth H. Falchuk, MD, HST affiliated faculty, has been promoted to Professor of Medicine at HMS/BWH. He is director of the core clerkship in medicine at BWH. His research focuses on molecules that induce differentiation of cancer cells.

Dava J. Newman, PhD, HST affiliated faculty, has been promoted to Professor of Aeronautics and Astronautics at MIT. Newman is course head of HST 515J: Aerospace Biomedical and Life Support Engineering. Her research deals with the mechanics of locomotion by astronauts and the design of space suits.

NEW CHALLENGES FOR FORMER FDA COMMISSIONER

Mark B. McClellan, MD, PhD '89, Commissioner of the Food and Drug Administration, was nominated in February by President Bush for the position of Head of the Centers for Medicine and Medicaid Services, the $500 billion agency that is implementing the new regulations expanding drug coverage. He was confirmed by a unanimous Senate vote March 12. He will be responsible for delivering health care to 76 million poor, elderly and disabled Americans. As FDA Commissioner, he encouraged pharmaceutical companies to integrate pharmacogenomics into drug studies, focused on food safety and introduced a risk-management program for new drugs.

IT'S A MATCH!

All 29 HST MD graduates (see pages 5 and 6) secured choice residency positions on Match Day. Fifteen will remain at Harvard-affiliated hospitals. This year's choices of fields are notable for a large increase in internal medicine (10), OB/GYN (3) and psychiatry (2).

HONORS & AWARDS

HST Professor **Lee Gehrke, PhD** has won two teaching awards this year. At the MIT Awards Convocation on May 4, he was honored with an award for excellence in graduate student teaching, particularly for his role in HST 010/011: Human Functional Anatomy. Gehrke also received an honorable mention for excellence in teaching in the pre-clinical years from HMS.

Lee Gehrke

Rajeev Malhotra (MD '04) received MIT's Goodwin Medal, which is presented to a graduate student who has established a place of distinction in teaching. It consists of a medal, a certificate and a cash gift of $2,000. It was established in memory of Harry Manley Goodwin, the first dean of the graduate school at MIT. Malhotra was a teaching assistant in HST 090: Cardiovascular Pathophysiology, HST 175: Cellular and Molecular Immunology, and HST 190: Statistical Planning and Analysis of Biomedical Investigations.

Irina S. Sigalovsky, student in the Speech and Hearing Bioscience Technology program, is the co-recipient of MIT's Helen Carr Peake Research Prize for 2004. Sigalovsky's doctoral research is being performed at MEEI under the supervision of Jennifer R. Melcher, PhD, HST affiliated faculty and Assistant Professor of Otology and Laryngology at HMS and MEEI. This work uses structural MRI to analyze two features of auditory cortical gray matter, namely gray matter myelin content and gray matter thickness. This approach promises to relate cortical neuroanatomy and function in individual humans. The Helen Carr Peake Research Prize honors the late wife of William T. Peake, ScD, HST affiliated faculty and Professor of Electrical and Bioengineering at MIT.

David A. Berry (MD '04) has won one of MIT's William L. Stewart, Jr. Awards, which recognize outstanding contributions by an individual student or student organization to extracurricular activities and events during the preceding year. Berry has served MIT for many years, beginning in his undergraduate years and continuing to the present.

David Ting (MD '04) received this year's HST Student Leadership Award. Ting was the first MD Joint Council Chair and one of the architects at the HST Council itself. He participated in a wealth of other volunteer and leadership activities, including captaining an HMS Olympics team and participating as a member of the MD Curriculum Committee. He has also exercised quiet but effective leadership among the members of his class and has been a role model and mentor for younger students.

M. Judah Folkman, MD, HST affiliated faculty and the Julia Dyckman Andrus Professor of Pediatric Surgery at HMS and Children's Hospital, received a $5 million Innovator Award from the Department of Defense Breast Cancer Research Program.

Rakesh K. Jain, PhD, HST affiliated faculty and the A. Werk Cook Professor of Radiation Oncology Tumor Biology at HMS and MGH, has been elected to the National Academy of Engineering. Jain was cited for integrating bioengineering with tumor biology and imaging gene expression and other functions *in vivo* for delivering drugs to tumors. He focuses his research on tumor pathophysiology, bioengineering, and molecular, cellular, anatomical, and functional imaging. In addition to directing the Edwin L. Steele Laboratory in MGH's Department of Radiation Oncology, Jain teaches HST 525J: Tumor Pathophysiology and Transport Phenomena.

Nancy C. Andrews, MD, PhD, HST affiliated faculty and Professor of Pediatrics at HMS and Children's Hospital, has been elected to membership in the Association of American Physicians.

HST Professor **Robert H. Rubin, MD** received the American Society of Transplantation/Wyeth Senior Achievement Award in Clinical Transplantation for 2004. Rubin's contributions to transplantation are many, ranging from pioneering efforts in transplant infectious disease and the management and prevention of opportunistic infection to the editorship of the journal *Transplant Infectious Disease*. He also helps provide the training for transplant physicians and surgeons from around the world.

HST Graduates

Master of Science Biomedical Enterprise Program

Adrian Hedley Benjamin Gottschalk
Dallas, TX
Improving the Efficiency of the Later States of the Drug Development Process: Survey Results from the Industry, Academia and the FDA
Future Plans: undecided

Peter John Anthony Smith*
Chesterfield, UK
Organizational Design: The Integration of Pharmaceutical Discovery and Development
Future Plans: Business development in pharmaceutical industry

Matthew William Strobeck*
Winchester, MA
The Drug Development Process: Evaluation of PDUFA I/II and an Investigation into Improving Drug Development
Future Plans: position with Westfield Capital Management, Boston

Richard George Wehby*
Miami, FL
Patents and Licensing and the Commercialization of University Research
Future Plans: Biomedical technologies investment banking with Musket Research Associates

Master of Science Biomedical Informatics Masters Program

Sameer A. Bade
Baltimore, MD
A Wireless Wide Area Network PDA Application for On-Call Ambulatory Care Physicians: User Requirements, a Novel Method for Software Development in a Health Care Organization, and a Prototype User Interface
Future Plans: Asst. Vice President for Clinical IT Strategy at MedStar Health, Columbia, MD

Jeanhee Chung
New York, NY
Concept-value Pair Extraction from Semi-Structured Clinical Text: A Case Study using Echocardiogram Reports
Future Plans: Instructor in Medicine at HMS, Boston; Asst. in Computer Science, Laboratory of Computer Science at MGH, Boston

John Chuo
Valley Stream, NY
Dynamic Risk Adjustment of Prediction Models using Statistical Process Control Methods
Future Plans: Assistant Professor of Neonatology, Bristol Myers Squibb Children's Hospital at Robert Wood Johnson University Hospital, New Brunswick, NJ

Yaron Shimon Denekamp
Haifa, Israel
Applying Axiomatic Design Methodology to Enable Adaptation of Clinical Guidelines to Local Contexts
Future Plans: Biomedical informatics research, Technion, Israel Institute of Technology, Haifa, Israel; Hospital attending internist, Technion-affiliated Carmel Medical Center, Israel

David Alan Hanauer
Furlong, PA
Computerized Automated Reminder Diabetes System (CARDS): Using Web and Wireless Phone Technology to Improve Diabetes Compliance
Future Plans: Position at the University of Michigan Center for Cancer Bioinformatics, Ann Arbor, MI

David Asher Klapper
Miami Beach, FL
Use of a Wearable Ambulatory Monitor in the Classification of Movement States in Parkinson's Disease
Future Plans: Clinical neuromuscular fellowship

Thomas Anton Lasko
San Diego, CA
When My Patient is not My Patient: Inferring Primary-Care Relationships Using Machine Learning
Future Plans: Candidate for the PhD in Computer Science at MIT, Cambridge

Ashish Nimgaonkar
Hyderabad, India
Feasibility of Detecting Single Gene Perturbations using Expression Microarrays
Future Plans: Postdoctoral fellowship at HMS, Boston

Robert Matthew Plovnick
Attleboro, MA
Health Information on the Internet: Strategies for Assessing Consumer Needs and Improving Consumer Information Retrieval
Future Plans: undecided

Heta Neeraj Ray
Harvard, MA
Building Application Frameworks for Integrative Genomics
Future Plans: Healthcare consulting

Sunil Kumar Saluja
Seattle, WA
A Computational Framework for the Identification, Cataloguing and Classification of Evolutionarily Conserved Genomic DNA
Future Plans: Clinical Neonatologist at Pedatrix Medical Group, Seattle; Informatician at Swedish Center for Perinatal Research, Seattle

Alicia Onnami Scott-Wright
Potomac, MD
Managing Revisions of Rules and Guidelines used in Outpatient Clinical Information Systems: Exploring a Hierarchical Knowledge Representation Model
Future Plans: Informatics Fellow at Decisions Systems Group, BWH, Boston; Candidate for the ScD in Health Policy in Management at Harvard School of Public Health, Boston

Reejis Stephen
Kollam, India
Context Identification in Electronic Medical Documents
Future Plans: undecided

Master of Medical Science Clinical Investigator Training Program

Anna Berkenblit
Needham, MA
Angiogenesis in Ovarian Cancer: Exploring the Diagnostic and Therapeutic Possibilities
Future Plans: Staff member, Division of Hematology/Oncology at BIDMC, Boston

Tamara G. Fong
Glen Ellyn, IL
Cerebral Blood Flow and Cognitive Response to Cholinesterase Inhibitors in Dementia
Future Plans: Clinical practice, Behavioral Neurology Unit at BIDMC, Boston

Thomas Hauser
Chicago, IL
Cardiovascular Magnetic Resonance in the Evaluation of Heart Failure
Future Plans: Director of Nuclear Cardiology, Cardiovacular Division at BIDMC, Boston

Daphne Jane Holt
Bethesda, MD
Emotional Processing in Schizophrenia: Cognitive and Neurophysiologic Substrates of the Delusion
Future Plans: Staff Psychiatrist, Department of Psychiatry at MGH, Boston

Ann S. LaCasce
Ellsworth, ME
Targeting NF-°B in Mediastinal Large B-Cell Lymphoma
Future Plans: Staff physician, Lymphoma Group at Dana-Farber Cancer Institute, Boston

David Joseph Milan
Boston, MA
Magnetic Resonance Imaging of Arrythmogenic Substrate in Ventricular Tachycardia
Future Plans: Staff physician, Cardiac Electrophysiology Service at MGH, Boston

Pamela L. Sheridan
Chicago, IL
Gait Timing Variability and Executive Dysfunction are Markers for Falls in Alzheimer's Disease
Future Plans: Staff neurologist, Behavioral Neurology at BIDMC, Boston

Samuel Clayton Somers
Kansas City, MO
Gastroesophageal Reflux Disease (GERD) and Asthma/ COPD in the Nurses' Health Study
Future Plans: undecided

Bryan J. Traynor
Dublin, Ireland
The Role of Start Condon Mutations of the Cu/Zn Superoxide Dismutase Gene in the Pathogenesis of Amyotrophic Lateral Sclerosis
Future Plans: Continued research, Neuromuscular diseases at MGH, Boston

Doctor of Medicine Medical Sciences Program

Lea Marcie Alhilali
Addison, TX
Surface Modification of Prosthetic Vascular Grafts

* *Also receiving Master of Science in Management of Technology from Sloan School*

Future Plans: Internship and Residency in Radiology at University of Texas SW Medical School, Dallas

Jeffrey Abraham Bander
Teaneck, NJ
Human Suppressor T-cells: Further Characterizations of CD4+ CD25+ T-cells
Future Plans: Internship and Residency in Internal Medicine at NYP Hospital/Columbia Presbyterian, New York, NY

Ronald Ching-Yun Chen
Topeka, KS
Developmental Therapeutic Strategies for UCN-01
Future Plans: Internship in Preliminary Medicine at MGH, Boston; Residency in Radiation Oncology at BWH, Boston

Ryan Chuang
Boulder, CO
Effects of In-Vitro Melanoma Extracts on Transcription-Independent p53-Mediated Apoptosis
Future Plans: Internship and Residency in Emergency Medicine at University Hospital, Cincinnati, OH

Jeffrey Hyo Chung
Honolulu, HI
Cloning of a Novel ROBO Molecule (zfROBO4) Essential for Neuronal and Vascular Development in Zebrafish
Future Plans: Internship and Residency in Internal Medicine at MGH, Boston

Tomas Cvrk
Usti Nad Labem, Czechoslovakia
Purification and Characterization of the Wild Type and Modified Human Parathyroid Hormone Receptor
Future Plans: Internship in Preliminary Medicine at Mt. Auburn Hospital, Cambridge; Residency in Anesthesiology at MGH, Boston

Christina Elizabeth Dancz
Rockville, MD
An Inducible System to Examine the Temporal Requirement of Listeriolysin O for Intracellular Growth and Cell-to-Cell Spread of Listeria Monocytogeneses
Future Plans: Internship and Residency in OB/GYN at University of Southern California, Los Angeles

Brian Barkley Graham
Seattle, WA
A Retrospective Study of Pediatric Tracheal Surgery
Future Plans: Internship and Residency in Internal Medicine at University of Colorado School of Medicine, Denver, CO

Anna Greka**
Thessaloniki, Greece
TRPC5 is a Regulator of Hippocampal Neurite Length and Growth Cone Morphology
Future Plans: Internship and Residency in Internal Medicine at MGH, Boston

Brook Jacob Hill
Panama City, FL
In Vivo Tissue Engineering in the Rat Kidney Using Collagen – Glycosaminoglycan Matrices
Future Plans: Internship with the University of Hawaii Transitional Residency Program, Honolulu; Residency in Diagnostic Radiology at Jackson Memorial Hospital, Miami, FL

Joseph Chia-Yu Hsieh
Hacienda Heights, CA
The Role of N-Kinase in CNS Axon Regeneration
Future Plans: Internship and Residency in Neurosurgery at University of Chicago, Chicago

Chao-Wei Hwang
Jamaica, NY
Local Pharmacokinetics of Stent-Based Drug Delivery
Future Plans: Internship and Residency in Internal Medicine at BWH, Boston

Wynn Hugh Kao**
Ellicott City, MD
Degradation of E6AP in the Presence and Absence of the HPV E6 Protein
Future Plans: Postdoctoral research

Samuel Goddard Katz**
Great Neck, NY
Regulation of Hematopoietic and Cardiac Development Mediated by the GATA Transcription Cofactor FOG-1
Future Plans: Internship and Residency in Pathology at BWH, Boston

Rahul Manu Kohli**
Bloomfield Hills, MI
Macrocyclization Catalysis by Excised Thioesterase Domains from Natural Product Synthetases
Future Plans: Internship and Residency in Internal Medicine at Hospital of the University of Pennsylvania, Philadelphia

Vikram Sheel Kumar
Boston, MA
The Design and Testing of a Personal Health System to Motivate Adherence to Intensive Diabetes Management
Future Plans: Internship and Residency in Clinical Pathology at BWH, Boston

** *Also receiving Doctor of Philosophy from Harvard University*

Liyun Li
Roxbury, MA
Identification of Molecular Controls Over Differentiation of Neural Precursors Into Cortical Projection Neurons (CPN)
Future Plans: Internship and Residency in OB/GYN at University of California, San Francisco

Wei Lin
Chicago, IL
The Identification and Characterization of the TLC Genetic Element and the RTX Gene Cluster in Vibrio cholerae
Future Plans: Internship in Medicine at MGH, Boston

Ugwuji Nkiruka Maduekwe
Lagos City, Nigeria
The Regulation of a Mitochondrial Macromolecular BAD-Containing Complex by Glucose
Future Plans: Internship and Residency in General Surgery at MGH, Boston

Rajeev Malhotra
San Diego, CA
Characterizing Mediators of Extracellular ATP Release and Degradation: MCD4, the Vacuolar H+-ATPase, and Ectoapyrases Ynd1 and CD39
Future Plans: Internship and Residency in Internal Medicine at MGH, Boston

Stephanie Misono
Beachwood, OH
Role of the Inwardly-Rectifying Potassium Channel Kir2.1 in Mammalian Craniofacial Development
Future Plans: Internship in General Surgery and Residency in Otolaryngology at University of Washington, Seattle

Kelvin Ming-Wei Neu
Singapore, Singapore
Towards Inducible Cell Signaling in the Whole Mouse: Optimizing Design for a Genetic Replacement Mouse Expressing a Membrane-Anchored Drug-Binding Domain (FKBP12)
Future Plans: Associate, Baker Brothers Advisors, New York; Co-Founder, Southeast Asian Leadership Initiative, New York

Yvonne Ou
Lexington, MA
The Endothelial Cell Nucleus as a Mechanosensor
Future Plans: Internship in Preliminary Medicine at BWH/Faulkner Hospital, Boston; Residency in Ophthalmology at University of California, Los Angeles

Ngoc Thi Phan
San Diego, CA
Examining the Antigenicity of Modified HIV-1 Envelope Glycoproteins
Future Plans: Internship and Residency in OB/GYN at University of California, San Francisco

Carolyn Ines Rodriguez**
Bonita Springs, FL
Innovating Genetic Technology to Map the Origin of the Precerebellar System
Future Plans: Internship and Residency in Psychiatry at NYP Hospital/Columbia Presbyterian, New York

Gisela Maria Sandoval**
Madrid, Spain
Molecular Genetic Analysis of an Interaction Between the Vesicular Acetylcholine Transporter and Synaptobrevin in Caenorhabditis elegans
Future Plans: Internship and Residency in Psychiatry at University of Chicago Hospital, Chicago

Lucy Q. Shen
Gaithersburg, MD
Exploring Rosiglitazone-Mediated Angiogenesis Inhibition – From the Lab Bench to the Clinics
Future Plans: Internship in Preliminary Medicine at BWH, Boston; Residency in Ophthalmology at University of California, Los Angeles

Michael Wei-Chih Su**
Renton, WA
Signaling Pathways Induced by Altered Peptide Ligands in CTL Fratricide
Future Plans: Internship in Preliminary Medicine at Newton-Wellesley Hospital, Newton, MA; Residency in Dermatology at University of California Davis Medical Center, Sacramento

David Tsai Ting
Pittsburgh, PA
Optimization of HoxB4 Expression in Embryonic Stem Cells in the Development of Hematopoietic Stem Cells
Future Plans: Internship and Residency in Internal Medicine at MGH, Boston

Michael Tsan Ty
Atherton, CA
Synaptic Conservation in Micropatterned Networks
Future Plans: Internship in Preliminary Medicine at BIDMC, Boston; Residency in Neurology at Harvard/MGH/BWH, Boston

Cristina Cunha Vieira
Warren, NJ
Cytomegalovirus and Aspergillus Infections Following Lung Transplantation: A Retrospective Cohort Study
Future Plans: Internship and Residency in Plastic Surgery at New York University School of Medicine, New York

Andrew Zhuang Wang
Changchun, China
Identification of Novel Transcriptional Targets of Tyrosine Kinase Fusion Proteins in Murine Models of Chronic Myeloid Leukemia
Future Plans: Internship in Preliminary Medicine at St. Luke's-Roosevelt Hospital Center, New York; Residency in Radiation Oncology at the Combined Harvard Radiation Oncology Program, Boston

Eric Sean Williams
Brooklyn, NY
Dietary Fatty Acids and the Metabolic Syndrome in Costa Rica: Modulation by Lipoprotein Lipase Polymorphisms
Future Plans: Internship and Residency in Internal Medicine at University of California, San Francisco

Doctor of Philosophy Medical Engineering/ Medical Physics Program

Atul Janardhan Butte
Cherry Hill, NJ
Exploring Genomic Medicine Using Integrative Biology
Future Plans: Pediatric endocrinology and research at Children's Hospital Boston and HMS, Boston

Ngon Dong Dao
Houston, TX
A New Class of Functions for Describing Logical Structures in Text
Future Plans: Teaching and entrepreneurial activities

Fa-Hsuan Lin
Taipei, Taiwan
Spatiotemporal Brain Imaging and Modeling
Future plans: Postdoctoral fellowship at Athinoula A. Martinos Center in the Department of Radiology, MGH, Boston

Daniel Clarke Mazzucco
Haddon Heights, NJ
Variation in Joint Fluid Composition and Its Effect on the Tribology of Replacement Joint Articulation
Future Plans: Biomechanical Engineering Consulting, Exponent Failure Analysis Associates

Bence Patrik Ölveczky
Österås, Norway
Retinal Processing of Natural Motion
Future Plans: Junior Fellow in the Harvard Society of Fellows, Cambridge

Eric Alan Osborn
Port Huron, MI
Actin Remodeling in Motile Cells
Future Plans: Candidate for the MD degree at HMS, Boston

Shunmugavelu D. Sokka
Centerville, Ohio
Cavitation Methods in Therapeutic Ultrasound: Techniques, Mechanisms, and System Design
Future Plans: Senior Research Scientist at Philips Medical Systems Research

Xinshu Xiao
Tangshan, China
Principal Component Based System Identification and Its Application to the Study of Cardiovascular Regulation
Future Plans: Postdoctoral position at MIT, Cambridge

Doctor of Science Medical Engineering/ Medical Physics Program

Emanuela Binello
Providence, RI
Role of Peroxisome Proliferator-Activated Receptors in Mechanisms of Rejection in Heart Transplantation
Future Plans: Candidate for the MD degree, HMS, Boston

Stacy J. Morris
Cambridge, MA
A Shoe-Integrated Sensor System for Wireless Gait Analysis and Real-Time Therapeutic Feedback
Future Plans: Asst. Professor, Department of Mechanical Engineering, University of Utah, Salt Lake City

Doctor of Philosophy Speech and Hearing Bioscience and Technology Program

Evan Chen
Urbana, IL
Characteristics of Syntactic Processing: An Examination Utilizing Behavioral and fMRI Techniques
Future Plans: Postdoctoral Fellow, Department of Neurology at MGH, Boston

Ehab Goldstein
Amman, Jordan
Prosthetic Voice Controlled by Muscle Electromyographic Signals
Future Plans: Consultant at Boston Consulting Group, Boston

John Alan Groff
Mt. Joy, Pennsylvania
Modulation of Cochlear Afferent Response by the Lateral Olivocochlear System: Activation via Electrical Stimulation of the Inferior Colliculus
Future Plans: Associate, McKinsey & Company, New York

Courtney C. Lane
Amarillo, Texas
Signal Detection in the Auditory Midbrain: Neural Correlates and Mechanisms of Spatial Release from Masking
Future Plans: Texas Instruments Postdoctoral Fellow, Electrical and Computer Engineering, Rice University, Houston, TX

Geoffrey Seth Meltzner
North Massaequa, NY
Perceptual and Acoustic Impacts of Aberrant Properties of Electrolaryngeal Speech
Future Plans: Senior Engineer, ALPHATECH, Inc.

Peninah S. Rosengard
Brookline, MA
Relationship between Measures related to the Cochlear Active Mechanism and Speech Reception Thresholds in Backgrounds With and Without Spectral and/or Temporal Fluctuations
Future Plans: Postdoctoral research

Jekwan Ryu
Kwang-Joo, Korea
Resolution Improvement in Optical Microscopy by Use of Multi-Beam Interferometric Illumination
Future Plans: Pioneer Research Fellow, Affymetrix, Santa Clara

Symposium focuses on mentoring program

This year's John F. and Virginia B. Taplin Symposium was devoted to BioMatrix. Now completing its fourth year, this unique mentoring program is geared toward MIT students interested in biomedical or life sciences.

HST Director Martha L. Gray, PhD, began the Symposium by thanking the Taplins for their generous support of the mentoring program, as well as their own mentoring of HST for more than 25 years. Nancy C. Andrews, MD, PhD, Associate Dean for Basic Sciences and Graduate Studies at HMS, and Philip L. Clay, PhD, Chancellor of MIT, both praised the contributions of this novel program to both HMS and MIT.

HST Associate Director Richard N. Mitchell, MD, PhD then addressed the objectives, history and sustainability of the program. BioMatrix benefits from a wide spectrum of faculty mentors from basic and clinical sciences, public health and industry. Graduate students from HST, HMS and MIT add even more variety and opportunities for mentoring MIT undergraduates students in group and one-on-one settings.

Regular BioMatrix events include student-coordinated dinners with a guest speaker and general discussions. More than 100 students and mentors attend these monthly dinners. Other events include lunches and other social or career-related encounters.

Several MIT undergraduates reported on their experiences with BioMatrix. They stressed the value of informal contacts and mentoring, opportunities for laboratory visits, research, career discussions, and leadership development. Max Cohen (MIT '05) and Daniel Kohane, MD, PhD, Assistant Professor of Pediatrics at HMS and MGH, described a formal, for-credit journal club with six mentorees this semester.

David A. Berry, an HST MD-PhD candidate, found that participating in BioMatrix was extremely valuable for his career. Melissa Thomas, MD, PhD, Assistant Professor of Medicine at HMS and MGH, described the challenging but rewarding role of a mentor. Finally, Catherine Modica, student life coordinator at HST, gave an overview of the accomplishments of this popular program and its connections within Harvard and MIT.

HST Director Joseph V. Bonventre, MD, PhD concluded the Symposium by recognizing major financial contributors with plaques. In addition to the Taplins, the following people helped

(continues on page 12)

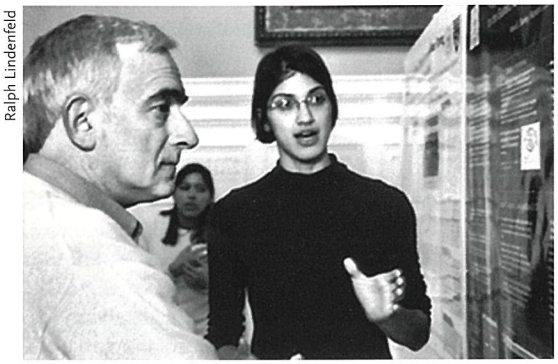
Student Research

The following is a sampling of the research presented at the 2004 HST Forum. The 93 posters represented a 20 percent increase over 2003. The poster session was underwritten by a generous grant from the Guidant Foundation.

Patrick Au (MEMP), working in the laboratory of Rakesh K. Jain, PhD in the Department of Radiation Oncology at MGH, presented his work on *Engineering Long-lasting Blood Vessels.* By co-implanting murine vascular endothelial cells and mesenchymal precursor cells he was able to generate the formation of long-lasting vascular networks *in vivo*, stable and functional for the natural life span of the animal. These interconnected tubes then connected to the host's circulatory system, forming both arteriolar and venular vessels. The arterial vessels responded to a vasoconstrictor. This method avoids genetic manipulation, which may be oncogenic.

Abigail S. Haka (MEMP), working with Michael S. Feld, PhD, Director of the George R. Harrison Spectroscopy Laboratory in MIT's Physics Department, presented *Diagnosing Breast Cancer Using Raman Spectroscopy.* The limitations of clinical and mammographic examination of the breast, which are characterized by a high rate of false positives, are addressed by the application of Raman spectroscopy to the evaluation of breast biopsies, which method is potentially applicable to use with a biopsy needle. A total of 130 Raman spectra from 58 patients were analyzed. Malignant lesions were differentiated from normal tissue with high sensitivity and high specificity.

Kumaran Kolandaivelu (MD/MEMP) and Max L. Cohen (MIT '05), with Elazer R. Edelman, MD '83, PhD '84, addressed the *Altered Kinetics of Platelet Adhesion with Stenting in Ex Vivo Coronary Thrombosis Model.* The pathophysiology of platelet adhesion to coronary stents, a common complication of this therapy of coronary heart disease, is not well understood. A bi-directional, pulsatile, closed-loop flow system was used to investigate the relationship between stent geometry and platelet adhesion under conditions of varying flow. The data obtained suggest that the adhesion of platelets to stents is a function of variations in flow and mass transport.



Ralph Lindenfeld

MEMP student Maya Barley discusses with Professor Michael Feld her poster of Design and Implementation of a Device for the Guided Ablative Therapy of Cardiac Arrhythmias.

Adam Siegel (MEMP), presented *An Integrated, Portable and Low-Cost Immunoassay for Resource-Poor Settings*, developed with George M. Whitesides, PhD, Professor of Chemistry at Harvard University. The standard immunoassay for HIV-1 infected patients is complex and expensive and thus is not applicable for environments that lack electricity and trained personnel. Here, an integrated approach to a miniaturized immunoassay, called POCKET (short for "portable and cost-effective test") is presented. (SK Sia et al., *Angew Chem Int Ed* 2004; 43: 498-502.)

Payal Kohli (MD '06), with Bruce D. Levy, MD and Charles N. Serhan, PhD at BWH, reported on *A Novel Docosatriene (10,17S-DT) is a Potent Inhibitor of Airway Inflammation and Hyper-responsiveness.* They presented evidence that 10,17S-DT is formed endogenously from docosahexaenoate acid (DHA) in respiratory tissues of mice. 10,17S-DT is a potent inhibitor of leukocyte infiltration, of NFkappaB and of cyclooxygenase–2 induction. When 10,17S-DT was administered to sensitized mice prior to an allergen aerosol challenge, airway inflammation and hyper-responsiveness to inhaled methacholine were blocked.

Lucy Q. Shen (MD '04), with Judah Folkman, MD, HST affiliated faculty and the Andrus Professor of Pediatric Surgery at HMS and Children's Hospital; and Lloyd P. Aiello, PhD, Associate Professor of Ophthalmology, Beetham Eye Institute, Joslin Diabetes Center, reported on *Exploring Rosiglitazone-Mediated Angiogenesis Inhibition—From the Lab Bench to the Clinics.* In mice, the anti-diabetic drug Rosiglitazone was shown to block the growth of tumor endothelium. This agent also could inhibit proliferation of endothelial cells *in vitro*, suppress angiogenesis in the mouse cornea, and slow the growth of tumors. The mechanism of this action was elucidated. Preliminary results of a clinical study suggest that this drug has a beneficial effect upon diabetic retinopathy.

Soma Weiss Day

The sixth annual Soma Weiss Student Research Day at HMS on April 15 featured 124 abstracts by medical and dental students, 19 of those from HST.

The three papers selected for oral presentation included one by Richard J. Lin (MD '06), with David E. Fisher, MD, PhD from the Dana-Farber Cancer Institute and the Children's Hospital. Entitled "Regulation of Endogenous Angiogenesis Inhibitor PEDF by Microphthalmia Transcription Factor is a Critical Determinant of Melanoma Angiogenesis Switch," this paper identified key steps of angiogenic switch in the development of malignant melanoma, thus providing potential therapeutic targets for this disease.

Following the student presentations was Jerome Groopman, MD, the Dina and Raphael Recanati Professor of Medicine at HMS and Chief of the Division of Experimental Medicine at BIDMC. In his talk, "Medicine and Science: How We Communicate What We Do," he used the clear and inspiring style for which he has become well known to review the path which led him to become a successful observer and communicator in academic medicine.

Daley

(continued from page 1)

the need for immunotherapy. He also touched on the moral and ethical implications and challenges of this work, calling for answers to questions such as "When does life begin?" and what, if any, role government should or would play in the regulation of embryonic stem cell research. Finally, he talked about the increasing role industry is playing in this field.

HST Director Joseph V. Bonventre, MD '76, PhD led a period of discussion. Then he thanked Daley and the students, faculty, alumni and guests who attended, especially the 93 HST students who had presented posters that afternoon.

Research News

NEAR INFRARED IMAGING IN MAPPING TUMORS

John V. Frangioni, MD, PhD '94, Assistant Professor of Medicine at HMS and BIDMC, is senior author of two articles describing a system of near-infrared (NIR) fluorescence biomedical imaging capable of intraoperative mapping of tumors and detection of occult metastases. This method uses NIR fluorophore indo-cyanine green, has been applied successfully to pigs, and promises to be applicable clinically. (AM DeGrand and JV Frangioni, *Technol Cancer Res Treat* 2003; 2: 553-52); S Kim et al., *Nat Biotechnol* 2004; 22: 93-7.)

COULD NEUTROPHIL DEPLETION PLAY A ROLE IN MYOCARDIUM?

Andrew H. Lichtman, MD, PhD, HST affiliated faculty and Associate Professor of Pathology at HMS and BWH, is senior author of a study of the influence of innate immunity on CD8+ T-cell responses against myocardium. In a model of CD8+ T-cell mediated myocarditis in the transgenic mouse strain CMy-mOva, which expresses ovalbumen (Ova) in cardiac myocytes, adoptive transfer of TCR transgenic ova peptide (SIINFEKL)-specific CD8+ T-cells induces a progressive and lethal myocarditis. Granulocytic inflammation sustains CD8+ T-cell mediated heart disease, whereas Neutrophil depletion had a protective effect. (N Grabie et al., *Am J Pathol* 2003; 163: 2413-20.)

ABDOMINAL INJURY DUE TO CHILD ABUSE

Robert Sege, MD, PhD '88, Associate Professor of Pediatrics at Tufts-New England Medical Center in Boston, is senior author of a report indicating that of 927 children 0 to 4 years old, who sustained blunt abdominal injury, this was associated with child abuse in 15.8 percent of cases. Furthermore, child abuse—compared to falls—manifested a six-fold increase in in-hospital mortality. (M Trokel et al., *Child Maltreat* 204; 9: 111-117.)

AUTOMATIC REMINDERS REDUCE EXCESSIVE IV USE

Jonathan M. Teich, MD, PhD '83, Assistant Professor of Medicine at HMS and BWH, is co-author of a study indicating that computer-generated reminders can produce a substantial reduction in excessive use of intravenous medications. At BWH, five medications with equal oral and intravenous bioavailability were targeted. Computer-based prompting resulted in an 11.1 percent decline in use of daily IV doses while oral daily doses increased by 3.7 percent. (MA Fischer et al., *Arch Intern Med* 2003; 163: 2585-9.)

ANGIOGENESIS INHIBITORS MADE SAFER

HST affiliated faculty **M. Judah Folkman, MD** is senior author of a report on an approach for targeting angiogenesis inhibitors specifically to the tumor vascularity, which reduces undesirable side effects. O-(chloracetyl-carbamoyl) fumagillol (TNP-470)—developed by Folkman and **Donald A. Ingber, MD, PhD**, Professor of Pathology at HMS/CHMC/HST—is a potent endothelial inhibitor with the broadest anticancer spectrum of all inhibitors of angiogenesis in animal models of cancer, and it has also been effective in clinical studies.

However, neurotoxicity—especially cerebellar dysfunction—accompanied therapy with TNP-470 in many patients. Here the synthesis of a water-soluble conjugate of N-(2-hydroxypropyl) methacylamide copolymer, Gly-Phe-Leu-Gly linker and TNP-470 is reported, which accumulates selectively in tumor vessels and enhances as well as prolongs the activity of TNP-470 *in vivo* in murine tumor and hepatectomy models. This polymer conjugation prevented TNP-470 from crossing the blood-brain barrier and decreased its accumulation in normal organs, thus avoiding toxic effects. (R Satchi-Fainaro et al., *Nature Medicine* 2004; 10: 255-261.)

Folkman is the Julia Dyckman Andrus Professor of Pediatric Surgery at HMS and CHMC, and Professor of Cell Biology at HMS.

EMERGENCY RESPONSE IN THE AFTERMATH OF IRANIAN QUAKE

Jay J. Schnitzer, MD, PhD '83, as a member of the International Medical Surgical Response Team, reports on the organization's response to the December 3, 2003, earthquake in Iran. The article details the wide spectrum of injuries and medical conditions treated, the surgical challenges, and the manifestations of psychological trauma, especially in children.

This magnitude 6.6 earthquake destroyed much of Bam, causing an estimated death toll of 40 percent of the city's 100,000 inhabitants, the destruction of all major hospital facilities, and the death or disability of most physicians and nurses. Within 24 hours, 58 healthcare workers of the Boston-based organization were on their way to Iran with a fully equipped, deployable field hospital. This facility had to cope with near-freezing temperatures, destroyed infrastructure, and absence of running water and sewage facilities. Over a four-day period, this team provided triage, initial stabilization and definitive care to 727 people, including six healthy newborns. (JJ Schnitzer and SM Briggs, *N Eng J Med* 2004; 350: 1174-76.)

Schnitzer is a member of the HST affiliated faculty and Associate Professor of Surgery at HMS and MGH.

NEW RENAL INJURY BIOMARKER

Available biomarkers for nephrotoxicity generally lack sensitivity and specificity. **Joseph V. Bonventre, MD '76, PhD**, Director of HST and the Robert H. Ebert Professor of Medicine at HMS/HST/BWH, as senior author introduces kidney injury molecule-1 (Kim 1), a type 1 membrane protein with extracellular immunoglobulin and mucin domains. Kim 1 was found to be a valuable biomarker in rats for renal injury by three types of nephrotoxins, including folic acid and cisplatin. Clinical study appears justified. (T Ichimura et al., *Am J Physiol Renal Physiol* 2004; 386: F552-63.)

CF REGULATOR PREVENTS INTESTINAL SECRETIONS

Alan S. Verkman, MD, PhD '81, Professor of Medicine and Physiology at the Cardiovascular Research Institute, University of California–San Francisco, is senior author of a study of how a small-molecule cystic fibrosis transmembrane conductance regulator (CFTR) blocker $CFTR_{inh}^{-172}$, previously described by this group, reduces fluid accumulation in intestinal loops induced by cholera toxin. The CFTR blocker prevented cAMP and cGMP-induced ion/fluid secretion in rodent and human intestine without affecting the absorption of intestinal fluid.

Based on their data, the authors predicted that $CFTR_{inh}^{-172}$ should have antidiarrheal efficiency in enterotoxin-induced secretory diarrheas, a major cause of infant mortality worldwide. (JR Thiagarajah et al., *Gastroenterology* 2004; 126: 511-19.)

PORTABLE VOICE MONITOR

Robert E. Hillman, PhD, HST affiliated faculty and Associate Professor of Otology and Laryngology at HMS and MEEI, is senior author, and **Kenneth N. Stevens, ScD**, HST faculty and the Clarence J. Lebel Professor of Electrical Engineering at MIT, is co-author of a report describing the design and testing of a device for unobtrusive, long-term ambulatory

Research News

monitoring of voice use. This "Portable Vocal Accumulator" (PVA), by means of a digital signal processor, analyzes input from a miniature accelerometer placed on the neck. Ninety-nine subjects with normal and dysphonic voices were studied. The current PVA is pocket-sized, and samples 11 hours of voice data. (HA Cheyne et al., *J Speed Lang Hear Res* 2003; 46: 1457-67.)

NEW SCAFFOLDS SUPPORT GROWTH OF HUMAN TISSUES

Robert S. Langer Jr., ScD, the Kenneth J. Germeshausen Professor of Clinical and Biomedical Engineering at MIT and HST, is senior author, and Erin B. Lavik, member of the HST Research Staff, is co-author of a report of the development of new three-dimensional polymer scaffolds in support of growth of human tissues *in vitro*. Biodependable polymer scaffolds promoted the growth and differentiation of human embryonic stem cells and the formation of three-dimensional structures. Specific growth factors induced characteristic neural cartilage or liver tissues. When transplanted into immunodeficient mice, the constructs continued to express specific human proteins (S Levenberg et al., *PNAS* 2003; 100: 2741-2746.)

DEPRESSION IN NURSING HOME RESIDENTS

Edward R. Marcantonio, MD '87, Assistant Professor of Medicine at HMS and BIDMC, is co-author of a 1996 survey of 3,747 residents in 951 nursing homes in the U.S., which is a representative sample of the 1.56 million Americans in almost 17,000 facilities. The prevalence of identified depression was 20.3 cases per 100 residents. Factors associated with a greater prevalence of depression included younger age, being female, marital status other than never married, white non-Hispanic ethnicity, better cognitive functioning, heart disease, Parkinson's disease, and length of stay between one and two years. (RN Jones et al., *J Amer Geriatr Soc* 2003; 51: 1407-1409.)

MOLECULAR MEDICINE AIDS LUNG CANCER THERAPY

Matthew Meyerson, MD, PhD '93, Assistant Professor of Pathology at HMS and the Dana-Farber Cancer Institute, is senior author of a study elucidating the mechanism by which gefitinib (also known as Ivessa) in the therapy of about 10 percent of patients with non-small cell lung cancer (NSCLC). This study, a collaboration of Harvard-affiliated institutions with MIT, NCI, the National Naval Medical Center, and Nagoya City University Medical School in Japan, found that the tumors of responders carry somatic mutations of the epidermal growth factor receptor gene (EGFR) in the presence of which the EGFR kinase inhibitor gefitinib cause tumor regression. The strikingly higher prevalence of EGFR mutation in Japanese patients may explain their markedly more frequent response to gefitinib. This work may well lead to the genetic screening of patients with NSCLC for suitability for gefitinib therapy. (DP Paez et al., www.scienceexpress.org, 29 April 2004: 1-8).

NEW WAY TO REDUCE IN-STENT NEOINTIMAL HYPERPLASIA

Elazer R. Edelman, MD '83, PhD '84, Director of the Harvard-MIT Biomedical Engineering Center at HST and the Cabot Professor of Health Sciences and Technology at HMS/MIT, is senior author of a study of the effect of systemic and transient depletion of monocytes and macrophages upon the in-stent neointimal formation in hypercholesterolemic rabbits. A single injection of liposomal alendronate significantly reduced neointimal hyperplasia and stenosis in stented, denuded iliac arteries. (HD Danenberg et al., *Circulation* 2003; 108: 279.)

ESTROGEN RECEPTOR MAY AMELIORATE DIABETES

Vamsi K. Mootha, MD '98 is first author of a study at the Eli and Edythe L. Broad Institute, MIT and HU, identifying a possible drug target for Type 2 diabetes. Genes involved in oxidative phosphorylation (OXPHOS) are known to exhibit reduced expression in skeletal muscle of diabetic and pre-diabetic individuals. This study identified estrogen-related receptor alpha (Erralpha) and GA repeat-binding protein alpha as key transcription factors regulating the OXPHOS pathway. The use of a synthetic inhibitor of Erralpha demonstrated its key role in PGC-1 alpha-mediated effects on gene regulation and cellular respiration. Thus, synthetic Erralpha agonists may serve to ameliorate insulin resistance in human diabetic muscle. (VK Mootha et al., *Proc Natl Acad Sci USA* 2004; 101: 6570-6575.)

TRANSDERMAL DRUG DELIVERY AND SAMPLE ACQUISITION

James C. Weaver, PhD, Senior Research Scientist in HST and MIT, **R. Rox Anderson, MD '84**, HST affiliated faculty and Professor of Dermatology at HMS and MGH, and colleagues have developed a method using micro-scissioned microconduits for the minimally invasive delivery of molecules of any size and for the extraction of samples of interstitial fluid or blood. Microscissioning is achieved by a limited flux of gas accelerated 25 μm inert particles passing through the aperture in a mask held against the stratum corneum. The procedure is rapid and painless, and it promises to have significant clinical usefulness. (TO Herndon et al., *BMC Med* 2004; 2:12.)

FRONTAL LOBE GRAY MATTER DENSITY IN BIPOLAR DISORDER

In Kyoon Lyoo MD, MS '02 is first author of a report from the Brain Imaging Center at McLean Hospital in Belmont, Mass. Brain magnetic resonance imaging, using voxel-based morphometry, was carried out in 39 subjects with bipolar I disorder and 43 control subjects. Bipolar subjects manifested significant decrease in gray matter density in Brodmann's area, the left medial frontal, the right interior frontal, and the right precentral gyrus. These results suggest that dysfunction of the non-dominant hemisphere is a component of bipolar disorder. (IK Lyoo et al., *Biol Psychiatry* 2004; 55: 648-51.)

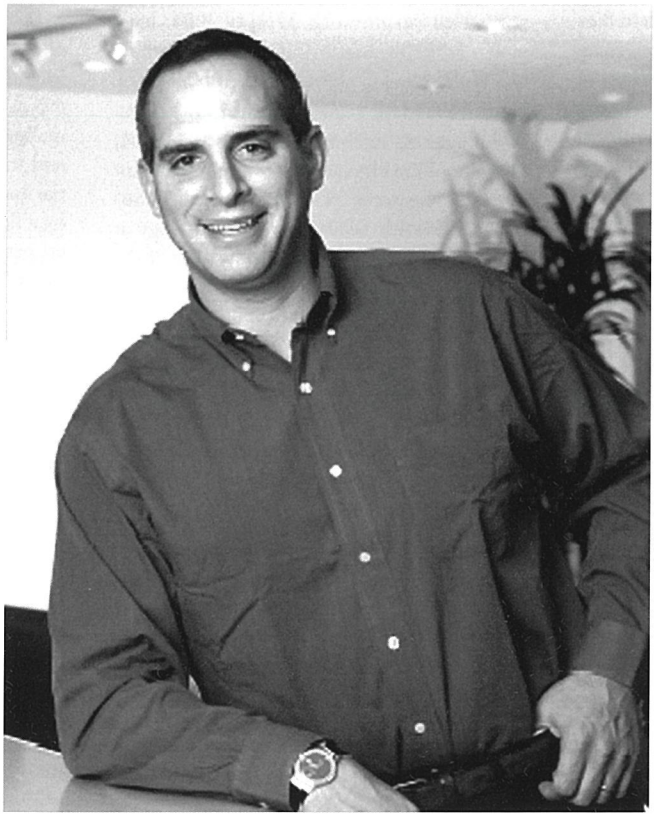
Alumnus Profile

The Behind-the-Scenes Guy

the unique career of Jim Tananbaum, MD

On a bright Northeastern winter afternoon, James B. Tananbaum, MD might seem like any other New Yorker pacing with his cell phone, trying to find a static-free zone. However, this affable California-based married father of two is far from average.

In fact, in the last decade, Tananbaum, a 1989 HST MD graduate, has created nearly 10,000 jobs. He co-founded GelTex Pharmaceuticals, a company that created and launched two products—which was purchased by Genzyme in a transaction valued at $1.6 billion. Most recently, Tananbaum, managing director of Prospect Venture Partners—a West Coast venture capital firm dedicated to investing in biomedical and health care innovation—helped establish and/or led investments for Theravance Inc, Biospect Inc, Infinity Pharmaceutical, Jazz Pharmaceuticals, Nanosys and PatientCare. For almost anyone, this would be an impressive list of accomplishments, but for Jim Tananbaum, you get the distinct feeling that he has only just begun.



Tananbaum is making an impact in biotechnology and pharmaceutics by shepherding the drug-discovery-to-commercialization process.

Through the inter-mingling of static and the urban symphony of New York City's mid-day traffic, Jim's passion for funding and establishing biotechnology and pharmaceutical companies comes through crystal clear—he wants to make an impact.

"The drug discovery to commercialization process is very slow, and when you get to see a product go to market, it is exciting," he says.

When explaining how he and his partners decide on which projects to become vested in intellectually and financially, he modestly states, "I assemble research teams to discover commercial drug products that ultimately go to market. I am really a behind-the-scenes person that gets involved in high-quality projects that could have a substantial impact on human health."

By getting the right people into the right companies, Tananbaum and his partners have seen a few of their initial companies grow legs, and the possibility that these companies will have a substantial impact on human health has grown from a dream to a reality.

"I am interested in applying solutions to a problem (i.e., people, resource, ideas, experience, and funding) and seeing the natural evolution of things," he says.

Even as a prospective medical school student, Jim knew he would be heading down a path that was not frequently traveled—applying medical and clinical research applications to a business model.

"HST's culture—an environment that was not afraid to let students explore their dreams—and its multi-disciplinary medical education, and tremendously bright faculty allowed me to explore my interest," he adds.

When asked where he thinks he might be in 10 or even 15 years, he quietly pauses and the urban symphony of New York City becomes a humming lull before he says, " I am really cognizant that I am living a charmed life. I am living my dream and I want to help a lot of other people live their dreams."

— Alison N. Haughton

Alumni News

1970s

Robert L. Nussbaum, MD '75, Senior Investigator and Chief of Genetic Disease Research Branch at the NIH, is this year's President of the American Society of Human Genetics. In October he will deliver the society's presidential address in Toronto.

Gus J. Vlahakes, MD '75, Professor of Surgery at HMS and MGH, has been appointed Chief of Cardiac Surgery at MGH. He has been a member of the Division of Cardiac Surgery for 16 years. His research focuses on the mitral valve and right heart function. His clinical interests include mechanical circulatory support and surgery of congenital heart disease in children and adults.

Greg Koski, MD '77, PhD, Associate Professor of Anaesthesia at HMS and MGH and former Director of the U.S. Office for Human Research Protections, was the moderator of "Self-Experimentation by Investigators: Panel and Case Discussion" held on March 26 at the Harvard School of Public Health. After reviewing the history of scientists' self-experimentation—including Forssmann's catherization of his own heart, which led to a Nobel Prize—and recognizing how widespread this practice is, discussions raised enough issues to merit a follow-up conference in 2005.

Dennis W. Choi, MD '78, PhD, Executive Vice President of Neurosciences at Merck Research Laboratories, was guest speaker in the HST Biomedical Engineering Seminar Series on April 22. In "Building a Laboratory," he reviewed his own professional career and analyzed key career decisions, stressing how clinical work and basic research inform each other. He described his career as non-linear, following personal goals and challenges, valuing bridges between medicine and biology, playing and coaching, and academia and industry.

1980s

Patricia Ann Walicke, MD '80, PhD has been appointed Vice President of Clinical Development at Rinat Neuroscience Corp. in Palo Alto, Calif. Walicke joined Rinat from Genetic, Inc., where she was a medical director in the department of clinical affairs, overseeing the clinical development of Raptiva, a monoclonal antibody therapeutic for psoriasis.

Judy Lieberman, PhD, MD '81, Professor of Pediatrics at HMS and CHMC, has been elected to membership in the Association of American Physicians.

Shaun R. Coughlin, MD, PhD '82, has been elected to membership in the National Academy of Sciences, which is considered one of the highest honors for a U.S. scientist. He is Director of the Cardiovascular Research Institute and Professor of Medicine and Cellular and Molecular Pharmacology at the University of California–San Francisco.

Jeffrey D. Macklis, MD '84, formerly Associate Professor of Neurology at HMS and Children's Hospital, is now Associate Professor of Surgery at HMS and MGH and has moved his laboratory to the Center for Nervous System Repair at MGH, of which he is the director. He is a leader in the new research showing that neurogenesis occurs in some regions of the adult mammalian brain and that it can be induced in regions of the brain where it does not normally occur.

Raphael Bueno, MD '85, Associate Professor of Surgery at HMS and BWH, has been appointed Associate Chief of the Division of Thoracic Surgery at BWH.

William O. Rogers, MD, PhD '88 remains head of the U.S. Navy's Malaria Program in Accra, Ghana. He writes, "I am responsible for coordinating and advancing the Navy's collaborative malaria research program in Ghana, an effort that involves approximately 10 doctoral level scientists and 60-80 technical staff at two research institutions in Ghana. It is an interesting leadership challenge for two reasons. First, I must communicate across different cultures, for example, the Ghanaian scientific culture and NIH and DOD regulatory cultures, and across widely different scientific disciplines ranging from clinical malariology to immunology to quantitative human genetics. Second, I have absolutely no hierarchical authority over anyone I work with; I can only make things happen by persuasion and example. It is challenging and enjoyable."

1990s

John Halamka, MD, SM '98, along with the Patient Site Team at BIDMC, received the "Investing in Information" award from the Massachusetts Health Data Consortium for his

(continues on page 12)

San Francisco Alumni Gathering

Daniel C. Shannon

Alumni Gregory Brown *(left)* and Ed Cheal enjoy breakfast and the reunion of some HST alumni in San Francisco.

During the annual meetings of the Orthopedic Research Society and the American Academy of Orthopedic Surgeons, **Martha L. Gray, PhD '86** and Dan Shannon met with HST alumni in San Francisco for breakfast on March 10. The group included **Alex Arrow, MD '96,** VP of Research at Wedbush Morgan Securities in Los Angeles. He reports that he is getting married this summer. **Gregory Brown, PhD '90, MD'92** is an NIH Postdoctoral Research Fellow and Instructor at the University of Minnesota. **Michael D. Buschmann, PhD '92** is at the Institute of Biomedical Engineering in the Department of Chemical Engineering at the Ecole Polytechnique, University of Montreal. **Edward Cheal, PhD '86** is Managing Director of Apex Surgical in Lakeville, Mass. **Ed Guo, PhD '93** has tenure in the Department of Biomedical Engineering at Columbia University. He is currently on sabbatical in George Whiteside's lab at Harvard University.

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Getting Ready to Play Ball

At the 4th annual HST Community Service Day on April 24, more than 40 HST students, faculty and staff accepted the challenge to repair a T-ball field before the Little League season opener, scheduled for that very afternoon. The HST crew, under the supervision of three members of the Massachusetts Department of Conservation and Recreation, furiously weeded, raked and shovelled the Jamaica Plain ballfield, with terrific results. By 2:30 p.m., the Little Leaguers were ready to play ball. This year's event was organized by the following members of the HST Community Service Committee: Luwam Semere, Ilka Netravali, Suzanna Zorca and Martin Zalesak. Special thanks go to Jim Lewis of Mississippi's Restaurant for donating a delicious breakfast and lunch to the hungry volunteers.

Zuzana Tothova (MD '05) weeds and hoes the Little League infield during HST's Service Day.

Deborah Sternlight

Council

(continued from page 1)

and to help foster career opportunities for current HST students.

- To nominate 24 alumni to serve on the HST Advisory Council.
- To help develop a fundraising program targeted at alumni.
- To help plan HST's 35th Anniversary Celebration.
- To build HST "brand recognition."

There was a great deal of enthusiasm for HST's 35th Anniversary Celebration, scheduled for September 23-25, 2005. The festivities in Boston are planned to immediately precede the Biomedical Engineering Society's annual meeting in Baltimore. A working group is being formed to plan the celebration, and a questionnaire will be circulated soon among alumni to solicit ideas for program content and social activities.

Other issues the group discussed related to the development of by-laws for the Council and ways the Council can help HST improve communication among alumni.

The following alumni attended the first brainstorming and planning session:

Christiana Bardon, MD '98
Joseph Bonventre, MD '76, PhD
Edward Cheal, PhD '86
Guohao Dai, PhD '01
Natacha DePaola, PhD '91
Stan Finkelstein, MD '75, PhD
Anthony Forster, MD '96
David Goodman, MD '93
Edward Guo, PhD '94
Domenica Karavitaki, PhD '02
Zvi Ladin, PhD '85
Leann Lesperance, MD '95, PhD '93
Vicky Marinescu, PhD, SM '03
Christopher Reid, MD '00, PhD
Susan Steinberg, MD '76
Ruilin Zhao, PhD '02

BioMatrix

(continued from page 7)

seed and support BioMatrix:

- Larry G. Benedict, PhD, Dean for Student Life, MIT
- Phillip L. Clay, PhD, Chancellor, MIT
- Isaac M. Colbert, PhD, Dean for Graduate Students, MIT
- The Alex and Brit d'Arbeloff Fund for Excellence in MIT Education
- Robert P. Redwine, PhD, Dean for Undergraduate Education, MIT
- Anthony Williams, Esq., HST Advisory Board member
- Rosalind Williams, former Dean of Undergraduate Education, MIT

Alumni News

(continued from page 11)

role in developing PatientSite, BIDMC's Web-based messaging system that allows secure communication between the hospital's patients and physicians. PatientSite has also won national recognition as "Most Innovative use of Communication Technologies to Improve Patient Care" at a recent Healthcare Delivery Solutions Congress (HDSC). More than 150 BIDMC physicians and 16,000 patients now use this system.

Halamka is Associate Professor of Medicine and Associate Dean of Medical Education Technology at HMS, and the Chief Medical Information Officer for CareGroup.