Health Sciences and Technology

Newsletter

Spring/Summer 1996

Directors' Notes:

Speech and Hearing Sciences Program

In February, the SHS External Advisory Committee reported on the overwhelming progress and quality of this HST effort. "The combination of Harvard and MIT faculty, and the truly unique students that the program has already attracted is unprecedented." The report stressed that the program seems well positioned to succeed in applying world-class neuroscience, classical physics, and modern systems analysis to the quantitative understanding of the function of complex human systems. Clinical medical expertise and research are integral components.

Master of Medical Science Degree in Clinical Investigation

The HMS Faculty Council has approved a new M.S. degree for fellows completing the two-year Clinical Investigator Training Program, a joint effort of the Beth Israel Hospital, HST, and Pfizer, Inc. The program provides trainees with direct experience in the performance of clinical investigation and a strong foundation in the computational and statistical sciences, biomedical ethics, principles of clinical pharmacology, *in vitro* and *in vivo* measurement techniques, and aspects of the drug development process.

Center for Engineering in Medicine Receives Whitaker Foundation Grant

The Center for Engineering in Medicine (CEM) at the MGH has received a Whitaker Foundation Development Award. In partnership with Brigham & Women's, the Beth Israel, the Boston Shriners Burn Institute and HST, the CEM will provide a coherent structure to integrate engineering with life science and clinical activity. **Martin L. Yarmush**, the Helen Andrus Benedict Professor of Surgery, is the director of the Center.

New Ciba-Geigy Professor at MIT

David E. Housman, PhD, Co-director of HST 160 - Molecular Biology and Genetics in Modern Medicine, has been appointed the Ciba-Geigy Professor of Biology at MIT. An enthusiastic and highly esteemed teacher, Prof. Housman is credited with the discovery of the genes responsible for Huntington's disease and myotonic dystrophy as well as the isolation of the gene for Wilms' tumor.

In Memoriam

HST notes with great sadness the loss this academic year of **Gloria M. McAvenia,** who died last October at the age of 57. Gloria came to MIT in 1972, working for **Roger Mark** and **Stephen Burns** in EECS, then moved to HST when the BMEC Center was funded by the NIH. We truly miss the warm spirit of this friend and colleague.

.....**Michael Moskowitz,** director of the Stroke and Neurovascular Laboratory at MGH and an HST affiliated faculty member, has been chosen as one of two recipients of the Klaus Joachim Zulch Prize, recognizing outstanding achievement in basic neurological research.....**Michael Rosenblatt** is president-elect of the Association of Bone and Mineral Research.

Research Reports:

Dopamine Imaging Agent Developed. Technepine binds to dopamine transporters and is the first reported compound to cross the blood-brain barrier and accumulate in a selective target, the striatum. The new compound was developed by **Prof. Alan Davison** of MIT's Chemistry Dept., **Dr. Bertha K. Madras** of the HMS New England Regional Primate Center, **Dr. Alun G. Jones**, HMS Professor of Radiology and HST research affiliate, and **Peter C. Meltzer** of Organix, Inc., among others. This imaging agent may lead to earlier and more accurate diagnosis of Parkinson's disease, attention deficit disorder (ADD), and depression in older people. Another technetium compound was the basis for Cardiolite, patented in 1984, that is widely used for heart perfusion imaging. MIT and Harvard have applied jointly for a patent on technepine. The research was reported in the March issue of *Synapse*.

New Cause of Glaucoma Found. **Evan B. Dreyer, MD, PhD '84** and colleagues reported in the *Archives of Ophthalmology* that all or part of the optic nerve damage and vision loss associated with glaucoma may be due to a neurotoxin, glutamate. The eyes of glaucoma patients had levels of glutamate twice as high as those without the disease. The next challenges are discovering the cause of glutamate overabundance and finding a drug that will stop its excesses but not block its vital functions. Drugs to control glutamate may also help people who suffer from Alzheimer's disease, stroke, AIDS dementia, and amyotrophic lateral sclerosis (ALS).

A First in Tissue Engineering. **Elazer Edelman, MD, PhD '83,** Assoc. Prof. of HST, with coauthors **Aruna Nathan, PhD**, and **Prof. Matthew A. Nugent** of Boston U., presented the first report of control of vascular proliferation by *in vivo* extravascular implantation of endothelial cells at the American Heart Assn. meeting in November 1995. Edelman recognized that the endocrine activities of vascular endothelium cells control the growth of intimal and smooth muscle cells, overgrowth of which follows endothelial injury and plays a key role in atherogenesis. Bovine endothelial cells, grafted onto biopolymeric matrices and wrapped around denuded rat carotid arteries, reduced intimal hyperplasia significantly, better than heparin administration. This work has significant implications for the potential control of atherosclerosis.

New Approaches to the Prevention of Hip Fractures. **Wilson C. Hayes, PhD**, Maurice E. Mueller Professor of Biomechanics at HMS and HST, and Director of the BIH Orthopedics Biomechanics Lab, and his associates (which include T. A. McMahon featured below), are focusing upon the prevention of hip fractures. Over 280,000 people fracture a hip annually in the U.S.; resultant health costs are estimated at over $10 billion. Recognizing that 90% of hip fractures are due to falls, Hayes and associates have been studying the descent and impact phases of falling. Whereas young people tend to fall forward and cushion the impact with their hands, old people tend to fall downwards, often directly on a hip. These studies showed that the energy generated by a fall may exceed that required to fracture a hip up to ten-fold. Hayes and coworkers developed a concept of "factor of risk", which incorporates estimates of femoral fracture force and impact force. In the elderly, hip fracture was more strongly associated with the "factor of risk" than with bone density. These studies and insights led to the design of pads to absorb the energy associated with falls. The most successful design was that of a horseshoe-shaped pad, designed to shunt the energy away from the femur. Clinical trials of this pad are in process. HST students associated with this work include MEMP alumni/ae **Amy C. Courtney, PhD '94; Steven N. Rabinovitch, PhD '94; Jeffrey C. Lotz, PhD '88;** and **Edward J. Cheal, PhD '86**, as well as current HST students **Steve Bowman, Catherine M. Ford, Cecile Smeesters,** and **Sara Wilson**.

McMahon Explains How to Walk on Water. **Thomas A. McMahon, PhD**, Gordon McKay Professor of Applied Mechanics in the Division of Applied Sciences as well as professor of biology at Harvard, on the HST faculty since its beginning, is in the news again for one of his wide-ranging interests (which have included the design of the Harvard Track as well as several novels). As reported in the Harvard University *Gazette*, McMahon documented the method used by *Basiliscus basiliscus*, the "Jesus Christ lizard" of Central and South America, to run across water at speeds of about six miles per hour. These lizards slap their feet quickly onto the surface, thus generating an upward lift and creating an air pocket.

Separating Chaos From Noise. **Dr. Chi-Sang Poon**, HST principal research scientist, and **Mauricio Barahona**, an MIT physics graduate student, have developed a new mathematical technique, adapted from earlier work by the late Norbert Wiener. The technique, which the scientists describe in the May 16 issue of *Nature*, is much more sensitive than others in distinguishing chaos from noise. It also requires an order of magnitude fewer data points, which allows many more researchers to analyze their data for chaos. In continuing work, Dr. Poon is working with colleagues to apply it to heart disease. Former Co-Director **Roger G. Mark**, and HST Prof. **Richard J. Cohen, MD, PhD, '76**, hope to use this technique as a diagnostic tool by detecting changes in the chaotic system of the human heartbeat.

CRC. Several drugs developed in the laboratory of **Dr. Richard J. Wurtman**, Cecil H. Green Distinguished Professor, and patented by MIT, may soon be used to treat obesity, insomnia, or stroke. These compounds are, respectively, dexfenfluramine, melatonin, and Citicoline (CDP-choline). In each case, basic science studies led to hypotheses about beneficial effects of the compounds, and these hypotheses were first tested at the MIT Clinical Research Center, then subjected to large scale testing.

Neutron Therapy Used Against Arthritis. **Jacquelyn C. Yanch** (W. M. Keck Career Development Associate Prof. in Biomedical Eng. in the Dept. of Nuclear Eng. and Whitaker College of Health Sciences and Technology) and colleagues have developed a new technique to treat rheumatoid arthritis dubbed Boron Neutron Capture Synovectomy (BNCS). First, a compound containing boron is injected into the arthritic joint. There, it concentrates into the synovium inflamed by the disease. A beam of neutrons directed at the area are absorbed by the boron, which destroys the diseased cells while largely sparing adjacent healthy cells. Yanch is developing BNCS in collaboration with researchers from HMS at Brigham & Women's Hospital, and with Newton Scientific, Inc. Continuing work on BNCS involves devising and testing a suitable boron compound and fine-tuning the accelerator. A possible chemical candidate has been provided by **Prof. Alan Davison**.

The 1996 HST Forum was held on March 21, 1996. After opening remarks by **Martha L. Gray** and **Michael Rosenblatt**, moderators **Konstantina M. Stankovic** and **Michael R. Hee** introduced the following speakers:

Chiang J. Li
"Roles of Tat Protein in AIDS Pathogenesis"

Sharon B. Chang
"Identification and Characterization of an Integrin-Associated Protein"

Lawrence M. McGlynn
"Viewing Suicide as an Option in the Context of AIDS, Terminal Cancer, and Other Medical Illnesses"

Alexander Guimaraes
"Detection of Inferior Colliculus Activity During Auditory Stimulation using Cardiac Gated Functional MRI with T1 Correction"

Marta K. Taylor
"Flow Cytometric Analysis of Cytokine Profiles in Allograft-Infiltrating Lymphocytes"

Siddharta Mukherjee
"The Viral Star Wars Programme: Viral and Chemical Strategies Against the Immune Response"

Mathai Mammen
"Measuring the Charge on Proteins and Measuring the Effect of this Charge on Affinity for Charged Ligands"

Kai Xia
"The Cytokine Activated Tyrosine Kinase Jak2 Activates Raf-1 in a p21 ras-dependent Manner"

Eric M. Morrow
"Quantitative Analysis of Rod Photoreceptor Development *In Vivo*"

John R. Baker
"Dynamic Mapping of the Human Brain using Functional Magnetic Resonance Imaging"

We gratefully acknowledge the support of **Abbott Laboratories; ARIAD Pharmaceuticals, Inc.; BASF Bioresearch Corporation; Hoechst Marion Roussel, Inc.; Hoffmann-La Roche, Inc.**; and the **Merck Research Laboratories,** for the 1996 HST Forum.

We were pleased to welcome **Dr. Steven Ludmerer** (Merck Research Laboratories), **Dr. Pieter Timmermans** (DuPont Merck Pharmaceutical), **Dr. Peter Farrell** (ResMed) and **Mrs. Marvin Asnes.** Our thanks to **Michael T. Bailin MD '84, Bethany Block MD '85, Merit E. Cudkowicz MD '90, George Daley MD, PhD '91, Jeffrey D. Macklis MD '84, Julie Greenberg PhD '94,** and **Jay J. Schnitzer MD, PhD '83** for joining us, and to the many alumni/ae who sent their regrets.

Alumni/ae Affairs:

HST-MD Alumni/ae Follow-up Survey. Thanks to the exemplary cooperation of most MD alumni/ae, the second follow-up study has been completed. Some of the results were presented as a poster at the May 5 BIOSCIENCE '96 meeting of the AFCR-ASCI-AAP societies in Wash., D.C. The abstract as published in the *Journal of Investigative Medicine* (formerly *Clinical Research*) 44:313A, 1996:

GENERATION OF PHYSICIAN-SCIENTIST MANPOWER. W.H. Abelmann, B.D. Nave, L. Wilkerson, I.M. London. Harvard Medical School and Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA.

The MD program of the Harvard-MIT Division of Health Sciences and Technology was founded in 1970. One of its goals was the application of the academic resources of the two universities to the education of leaders in academic medicine and biomedical sciences. The first class was admitted in 1971. Prerequisites for admission were strong background in quantitative sciences and demonstrated interest in research. Research and a thesis were obligatory. Enrollment in a PhD program was elective. By 1988, 294 students had graduated, 199 with MD only, 83 with MD-PhD degrees. Follow-up questionnaires of 294 graduates (92% return) revealed that 210 (71.4%) held faculty appointments in 64 medical schools. Overall, 75% of responders were engaged in research: 65% of MDs and 89% of MD-PhDs. One hundred and four (39%) of all responders spent more than 50% of their time on research: 54 (27%) of MDs and 50 (60%) of MD-PhDs. Seventy-six percent of responders were active in teaching. Our experience indicates that both an MD-PhD program and a research oriented MD program are effective in producing physician-scientists and leaders in academic medicine.

Congratulations to six alumni!: **Robert L. Nussbaum, MD '75**, and **Alan S. Verkman, MD, PhD '81**, were elected to membership in the Association of American Physicians this spring. Newly elected to the American Society for Clinical Investigation were **Steven P. Balk, MD, PhD '83, Mark Goldberg '81, T. Jake Liang, MD '81,** and **Robert A. Star, MD '80.**

Alumni/ae News:

Andrew Freese, MD, PhD '90 and his wife Marcia Geary Freese welcomed Ernst Timothy Freese, born February 6, 1996. Andrew is currently a clinical instructor in the Division of Neurosurgery, Univ. of Pennsylvania School of Medicine, and director of the Laboratory of Molecular Neurosurgery, Graduate Hospital of the University of Pennsylvania. He is also Executive Director of the Parkinson's Disease Gene Therapy Consortium.

Ray A. Hammond II, MD '75 was profiled in the *Boston Globe* Living/Arts section on June 6. Reverend Hammond is the pastor of Jamaica Plain's Bethel African Methodist Episcopal Church. The article stated, "...among other things, he is president of the Ten Point Coalition, a highly regarded church mobilization that deals with violence among black and Latino youth, and he is also spearheading the group that is attempting to retain an appointed school committee in Boston." Hammond has developed a number of initiatives in gang mediation, dropout prevention, and job searches. Hammond says he "accepted the call" to his second career "because healing patients' bodies was a limited method of treating the human condition." We hope that the skills he developed in HST for investigating subjects in depth and in an interdisciplinary fashion will continue to serve him well in the important work he has undertaken in his ministry.

David Da-I Ho, MD '78 continues his work at the Aaron Diamond AIDS Research Center in New York, where he is scientific director and CEO. As stated in *Business Week*, Ho and colleague George Shaw of the University of Alabama "proved that HIV doesn't mysteriously lie dormant in the body only to emerge years later, as once thought. Rather, the virus goes on the attack from the very start, making up to a staggering 10 billion copies a day."

Young-Jo Kim, MD, PhD '94 received the 1995 Dr. Harris Yett Award in General Surgery during his internship at the Beth Israel Hospital. He is currently a resident in orthopedic surgery at MGH.

T. Jake Liang MD '84 is leaving MGH to assume directorship of the Liver Diseases Section of NIH (NIDDK, Bethesda, MD) Congratulations!

Herbert Lin, MD, PhD '95 is proud of his future HST applicant, son Alexander Ming Lin, born March 22, 1996 at 11:23 EST, 7 lbs. 3 oz.

David Page, MD '94, Associate Professor of Biology at MIT and Associate Director of the Whitehead/MIT Center for Genome Research, as well as Chairman of the Whitehead Institute Task Force on Genetic Testing, Privacy and Public Policy, has been given a new challenge. In March, he was appointed to a legislative committee of the Commonwealth of Massachusetts which is charged with defining the state's role in managing the use and dissemination of genetic information. The committee brings together experts in genetics, ethics, law and health policy.

David C. Seldin, MD, PhD, '86 has been named the Massachusetts Department of Public Health Breast Cancer Research Scholar 1996-1997.

Barry Sleckman, MD, PhD, '90 was recently awarded the 2nd Annual Burroughs Wellcome Fund Career Award in the Biomedical Sciences.

Cynthia Sung, PhD '89 is pleased to announce the arrival of Wendy Weiyu Sung-Clarke, born May 12, 1995; adopted in Anhui, China, November 18, 1995. Web address http://shamu.med.jhu-edu/clarke/wendy.html

George R. Wodicka, PhD '89, associate professor of electrical engineering at Purdue University, has been awarded a Guggenheim fellowship, one of 158 fellows chosen from nearly 4,000 nominations nationwide. Guggenheim fellowships are awarded on the basis of unusually distinguished achievement in the past and exceptional promise for future accomplishment. With the fellowship, he will take a sabbatical leave as a visiting faculty member in Boston during the spring and summer of 1997 to pursue biomedical research. Working with pre-term infants at the MGH, he will evaluate a technique he devised that uses acoustics to guide the placement of breathing tubes and monitor their position. With researchers at MIT, he will collaborate on using the characteristics of breathing sounds to detect and locate obstructions in adult patients with sleep apnea.

Nancy G. Wolf, MD '90 is now an NCI Postdoctoral Fellow in the Department of Genetics at Case Western Reserve, doing research on ovarian cancer. She informs us that **John M. Lewin, MD '90** and his group at the University of Colorado were awarded a grant from the US Army to study digital (filmless) mammography in 20,000 women in Denver and Massachusetts.

The HST Division gives special thanks for the support of our alumni/ae, faculty, and friends. All donors during our fiscal year 1995-96 are listed, unless anonymity has been requested.

HST Alumni/ae Funds

Craig Alter
Camille L. Bedrosian
Howard Bernstein
Edward S. Bessman
Brian Camazine
Edward Cheal
Nai-Kong Cheung
Gilbert Chu
Sharon A. Clark
Elisabeth J. Cohen
Merit E. Cudkowicz
George Q. Daley
Lawrence I. Deckelbaum
Elana B. Doering
David Farley
Oren Grad
Peter F. Hahn
Bengt L. Ivarsson
Charles H. Karaian
Lloyd Klickstein
Maria Elena Lara
Angel W. Lee
Dana Leifer
Rebecca Leong
T. Jake Liang
Jeffrey D. Macklis
Joseph R. Madsen
Constance L. Monitto
Ira S. Nash
Ronald R. Newman
Robert L. Nussbaum
Annabelle Okada
David Pincus
Jennifer M. Puck
Ivan C. Rokos
Anthony F. Shields
Lawrence C. Siegel
Samuel Singer
Priscilla J. Slanetz
Julian Solway
Susan Steinberg
Eric H. Stern
Cynthia Sung
Swee Lian Tan
Robert A. Van Wesep

James Andrew Smith Fund

Mr. and Mrs. Bruce Classon
Patricia A. Cunningham
Anne Fox
Mr. and Mrs. Donald Jaffin
Mrs. Charles Krakauer
Mr. and Mrs. Lawrence Krakauer
Dr. and Mrs. Leroy Lavine
Gleniss Loventhal
Sylvia Lubin
Dr. and Mrs. Henry Mankin
Margaret McLellan
Mary Miller
Mr. and Mrs. William Moss
Joshua Paris
Mr. and Mrs. Stephen Paris
Seymour and Jolyon Rosen
Dr. and Mrs. Michael Rosenblatt
Christopher and Jennifer H. Zannetos
Kang Zhang

Roger G. Mark Fund

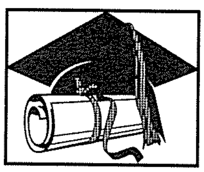
Walter H. Abelmann
S. James Adelstein
G. Octo Barnett
Martitia F. Barsotti
William S. Beck
Howard Bernstein
BI Medical Group
Joseph V. Bonventre
Gilbert Brodsky
Scott Cameron
Martin C. Carey
Ching-Yen Joseph Chan
Patricia A. Cunningham
Charles S. Davidson
C. Forbes Dewey
Deborah Faryniarz

Roger G. Mark Fund
Wayne M. Flicker
Jeffrey S. Flier
Martha L. Gray
Robert A. Greenes
Roger J. Hajjar
Peter F. Hahn
Anne C. Hurlbert
Donald Ingber
Brian Jaski
Charles H. Karaian
Nelson Y.S. Kiang
Richard Kitz
Henry Klapholz
Elaine Lee
Tai Sing Lee
Andrew H. Lichtman
Cynthia D. LuBien
Thomas A. McMahon
Richard N. Mitchell
Robert C. McKinstry
Abraham N. Morse
Michael A. Moskowitz
Elizabeth J. Murphy
Joseph B. Nadol
Anju Nohria
William T. Peake
Chi-Sang Poon
Dwight R. Robinson
Michael Rosenblatt
Robert H. Rubin
Robert L. Sah
Robert H. Schapiro
J. Philip Saul
Daniel C. Shannon
Lawrence C. Siegel
Kenneth Smith
Myron Spector
Cynthia Sung
Urban Medical Group
Felix M.H. Villars
Steven E. Weinberger
Robert M. Weisskoff
Augustus A. White, III
Laurence R. Young

Corporations and Foundations
ARIAD Pharmaceuticals, Inc.
Abbott Laboratories
BASF Bioresearch Corporation
DuPont Merck Pharmaceutical Company
Joseph C. and Esther Foster Foundation
Hoechst Marion Roussel, Inc.
Hoffmann-La Roche, Inc.
Lemberg Foundation
June Rockwell Levy Foundation
Liberty Mutual/The Boston Foundation
Merck Company Foundation
Merck Research Laboratories
George A. Ramlose Foundation
Rhône-Poulenc Rorer
Silverweed Foundation

Friends
Rosalie H. Levine
Mr. and Mrs. James Levitan
Mr. and Mrs. Steven Memishian
Mr. and Mrs. Juan Meyer
Alexander Racolin
George Van Hoe
Edward Webster
Suzanne Whitman
Mr. and Mrs. William Young

Bequests
Estate of Thomas Cabot



HST Graduates 1996

Doctoral Curriculum in Medicine

Asa Abeliovich, B.S., Ph.D.
Urbana, Illinois
"The Role of Kinase C-γ in Mammalian Central Nervous System Function: A Genetic Approach."
Internship: Preliminary Med.; Residency: Neurology; UCSF, San Francisco, CA.

Alexander Kenneth James Arrow, B.A.
Wexford, Pennsylvania
"Manipulating the Wound Healing Process with Proteoglycans: A Study in Dermal Dynamics."
Internship: Plastic Surgery; UCLA Medical Center, Los Angeles, CA.

Scott Ira Berkenblit, S.B., S.M.
Also Received Ph.D.
North Valley Stream, New York
"Spatial Localization of Cartilage Degeneration Using Electromechanical Surface Spectroscopy with Variable Wavelength and Frequency."
Internship: Orthopedic Surgery; Johns Hopkins H., Baltimore, MD.

Monica Subramanya Bettadapur, B.S., S.M.
Clifton, Virginia
Cum Laude
"An Investigation of Perfusion Within Pre-fabricated Free Flaps Via a New Thermal Technique."
Internship: Internal Med.; Hospital of the U. of Pennsylvania, Philadelphia, PA.

Sandip Biswal, B.S.
Randallstown, Maryland
"The Combined Effects of Interleukin-1ß and Mechanical Compression on the Spatiotemporal Distribution of Glycosaminoglycans in Calf Epiphyseal Cartilage."
Internship: Preliminary Med.; Presbyterian Hospital, NY, NY; Residency: Radiology; Stanford Health Services, Stanford, CA.

Jerrold Lee Boxerman, S.B., S.M., Ph.D.
St. Louis, Missouri
"Noninvasive Measurement of Physiology Using Dynamic Susceptibility Contrast NMR Imaging."
Internship: Preliminary Med.; Residency: Radiology; Johns Hopkins H., Baltimore, MD.

Adam Michael Brook, A.B.
New York, New York
"A Requirement for E2F in Both Proliferating and Differentiating Cells."
Future Plans: Candidate for Ph.D. Degree; Biological and Biomedical Sciences Program, DMS, HMS.

David Chan, B.S., Ph.D.
Brookline, Massachusetts
"Molecular Analysis of Two Mouse Limb Mutants: *limb deformity* and Strong's Luxoid."
Future Plans: Postdoctoral Fellow, Whitehead Institute, Cambridge, MA.

Charlene M. Chiang, B.S.
La Palma, California
"Localization of the T-Cell Cytokine, Interferon-Gamma Eutopic and Ectopic Human Endometrium."
Internship: Internal Med.; Residency: Primary Care; Mt. Auburn, Cambridge, MA.

Michael F. Chiang, B.S.
Also Received M.S. in HST
Northville, Michigan
"Selective Laser Irradiation as a Technique for Studying the Anatomy and Electrophysiology of the Retina."

Internship: Preliminary Med.; Sinai Hospital, Baltimore, MD; Residency: Ophthalmology; Johns Hopkins U., Baltimore, MD.

Timothy Lloyd Davis, B.S., S.M.
Kokomo, Indiana
Cum Laude
"White Matter Tract Visualization by Diffusion Tensor MRI."
Internship: Radiology; Barnes H., St. Louis, MO.

Beth Ellen Ebel, B.A., M.Sc.
Littleton, Colorado
"Exploration of the Role of Cytokines and Oligosaccharides in the Maintenance of Immunologic Anergy in Patients with Chronic and Hepatosplenic Schistosomiasis."

Internship: Pediatrics; Johns Hopkins H., Baltimore, MD.
The New England Pediatric Society Prize to the senior who in the opinion of peers and faculty best exemplifies those qualities one looks for in a pediatrician.

Bernard Martin Fine, B.S., Ph.D.
Vancouver, British Columbia, Canada
"Light Scattering By Aqueous Protein Solutions that Exhibit Liquid-Liquid Phase Separation."
Internship: Internal Med.; Stanford Health Services, Stanford, CA.

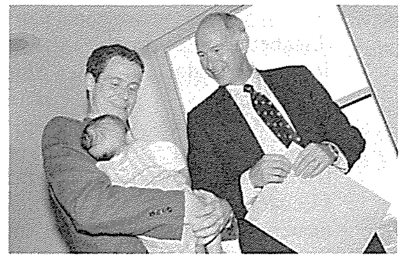
Anthony Carlyle Forster, B.S., Ph.D.
Melbourne, Australia
Magna Cum Laude
"A Novel Method for Ligand and Drug Discovery."
Internship: Pathology; Brigham & Women's H., Boston, MA.

Jan O. Friedrich, B.Sc., Ph.D.
Halifax, Nova Scotia, Canada
Magna Cum Laude
"The Biochemistry of Non-ischemic Myocardium in the Infarcted Heart: Development of ^{31}P Spectroscopic Imaging Techniques."
Internship: Internal Med.; U. of Toronto, Toronto, Canada.

Christopher Michael Haqq, B.S.
Also Received Ph.D., Harvard University
Vancouver, British Columbia, Canada
Cum Laude
"Identification of MARE-1, a Mullerian Inhibiting Substance Activating Response Element." and "Mammalian Sexual Dimorphism: Regulation of Mullerian Inhibiting Substance Gene Expression by SRY."
Internship: Internal Med.; UCSF, San Francisco, CA.

Vincent Trien-Vinh Ho, A.B.
East Boston, Massachusetts
Magna Cum Laude
"Regulation and Expression of the Human Erythropoietin Gene."
Internship: Internal Med.; Brigham & Women's H., Boston, MA.
Harold Lamport Biomedical Research Prize for the best paper reporting original research in the biomedical sciences.

Joshua Marc Kosowsky, A.B.
Brookline, Massachusetts
"Expression of an Epitope-Tagged FKBP25-Associated Proteins."



Internship: Emergency Med.; U. of Cincinnati H., Cincinnati, OH.
The Society for Academic Medicine Excellence in Emergency Medicine Award.

Linh U. Le, B.S.
Pasadena, California
"Radiologic Characteristics of Solitary Pulmonary Nodules of 1cm or Less in Diameter on Computed Tomography."
Internship: Preliminary Med.; St. Mary's Medical Center; Residency: Radiology; UCSF, San Francisco, CA.

Lawrence Michael McGlynn, B.S., M.S.
Izmir, Turkey
"Viewing Suicide as an Option in the Context of AIDS, Terminal Cancer, and Other Medical Illnesses."
Internship: Internal Med.; St. Vincent's H., NY, NY.

David Joseph Milan, B.S.
Los Osos, California
Cum Laude
"The Molecular Mechanism of Immunosuppression by Cyclosporin A and FK506."
Internship: Internal Med.; Brigham & Women's, Boston, MA.

Sanjay Rajnikant Patel, B.A.
Warsaw, New York
"A Dynamic Computational Model of the Alveolar Liquid Layer."
Internship: Internal Med.; Hospital of the U. of Pennsylvania, Philadelphia, PA.

Frank John Rybicki, B.S.
Also Received Ph.D.
Cherry Hill, New Jersey
"Novel Encoding Technology for Magnetic Resonance Imaging (MRI)."
Internship: Transitional; Mt. Auburn, Cambridge, MA; Residency: Radiology; Brigham & Women's H., Boston, MA.

Manish Arvind Shah, B.E.S.
Gaithersburg, Maryland
Magna Cum Laude
"A Study of Kinesin and Its Isoforms in Neurons."
Internship: Internal Med.; Duke University Medical Center, Durham, NC.

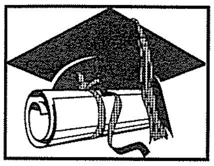
Lisa Y. Shieh, B.S., Ph.D.
West Lafayette, Indiana
"Erosion and Release from Biodegradable Polyanhydrides."
Internship: Internal Med.; Stanford Health Services, Stanford, CA.

Daniel Kevin Sodickson, B.S., B.A., Ph.D.
Waban, Massachusetts
"Spin-Spin Couplings in Two Limits: Experimental, Theoretical, and Computational Studies of Dipole-Coupled Nuclear Spins in Solids."
Future Plans: Postdoctoral Fellow, BIH, Boston, MA.

Erich Christian Strauss, A.B.
Alhambra, California
"Molecular Mechanisms Controlling Gata-1 Gene Expression and

Globin Locus Control Region Function in Erythroid Cells."
Future Plans: Research Fellow; Mayo Clinic, Scottsdale, AZ.

Tad John Wieczorek, B.A.
Fern Park, Florida
Cum Laude
"Response Modulated Excitation with Applications."
Internship: Pathology; Brigham & Women's H., Boston, MA.



Ph.D. in Medical Engineering/Medical Physics

Scott Ira Berkenblit, S.B., S.M.
Also Received M.D.
North Valley Stream, New York
"Spatial Localization of Cartilage Degeneration Using Electromechanical Surface Spectroscopy with Variable Wavelength and Frequency."

Frederick Yen-Ching Chen, A.B., S.M.
Athens, Georgia
"Biomechanical Aspects of Cardiomyoplasty."
Future Plans: Candidate for M.D. Degree at HMS.

Marilyn Yun-Fei Chen, B.S., S.M.
Elmhurst, Illinois
"Acoustic Correlates of Nasality in Speech."
Currently a Postdoctoral Fellow at the Institute of Linguistics, Chinese Academy of Social Sciences, Beijing, China.

George Chen-Hsi Cheng, A.B., S.B., S.M.
Rolla, Missouri
"Regulation of Vascular Smooth Muscle Cell Function by Mechanical Strain."
Future Plans: Candidate for M.D. Degree at HMS.

Anthony Evan English, B.S., M.S.
Roberts Creek, British Columbia, Canada
"Phase Transitions in Polyampholytic Polymers and Hydrogels."
Future Plans: Postdoctoral Fellow, Dept. of Chemistry, MIT.

Alba Minerva Garcia, B.S., S.M.
San Diego, California
"Mechanisms of Macromolecular Transport Through Articular Cartilage: Relevance to Loading."
Future Plans: Research Scientist.

Yuval Gazit, B.S.
Kiryat-Ono, Israel
"Fractal Vasculature and Vascular Network Growth Modeling in Normal and Tumor Tissue."
Future Plans: Management Consultant.

Elaine Lee, S.B., M.S.
Rockville Centre, New York
"Effects of Cytokines and Monocytes on Matrix Metalloproteinases in
Human Vascular Smooth Muscle Cell Cultures."
Future Plans: Research Scientist at Baxter Healthcare Corporation, Renal Division, McGaw Park, IL.

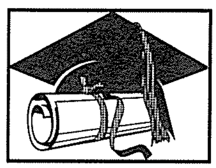
Thomas Mark Quinn, B.Sc., S.M.
Calgary, Alberta, Canada
"Articular Cartilage: Matrix Assembly, Mediation of Chondrocyte Metabolism and Response to Compression."
Future Plans: Postdoctoral Fellow, M. E. Muller Institute for Biomechanics, Bern, Switzerland.

Frank John Rybicki, B.S.
Also Received M.D.
Cherry Hill, New Jersey
"Novel Encoding Technology for Magnetic Resonance Imaging (MRI)."

Robert William Stadler, B.S., S.M.
Pittsburgh, Pennsylvania
"Noninvasive Ultrasound Techniques for Assessment of Early Atherosclerosis."
Future Plans: Postdoctoral Fellow, Boston Heart Foundation Cardiovascular Institute, Cambridge, MA.

Thomas D. Wang, B.S., S.M.
Los Alamitos, California
"Fluorescence Endoscopic Imaging System for Detection of Colonic Adenomas."
Future Plans: Candidate for M.D. Degree at HMS.

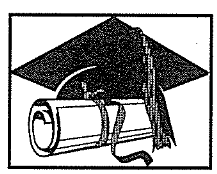
Jun Wu, B.S.
Beijing, China
"Photon Migration in Turbid Media: Time-Resolved Optical Imaging in Tissue-Like Phantom."
Future Plans: Candidate for M.D. Degree at HMS.



Sc.D. in Radiological Sciences Joint Program

Chandrasekhar Ramanathan, B.Tech., M.S.
Bombay, India
"Biomedical Solid State NMR: An ADRF Cross Polarization Study of Calcium Phosphates and Bone Mineral."
Future Plans: Postdoctoral Fellow, NMR Center, MGH, Charlestown, MA.

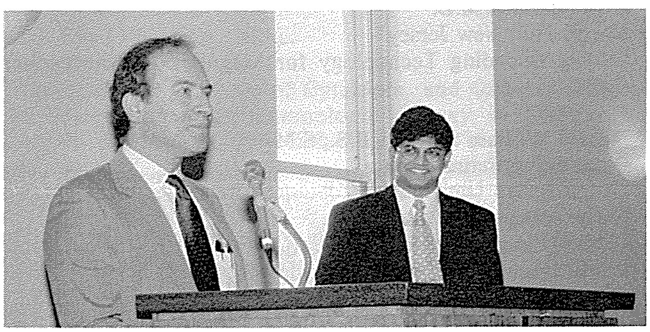
Xin Yu, M.S.
Beijing, China
"Metabolic Flux, Transport Activity and Subcellular Communication in Intact Hearts from Dynamic ^{13}C in NMR Spectroscopy."
Future Plans: Research Fellow, NMR Center, MGH, Charlestown, MA.



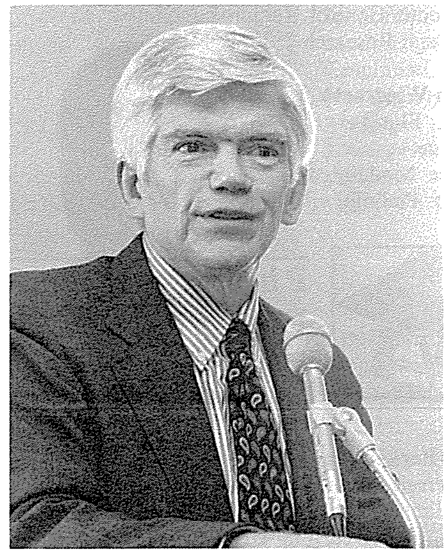
M.S. in HST

Michael F. Chiang, B.S.
Also Received M.D.
Northville, Michigan
"Selective Laser Irradiation as a Technique for Studying the Anatomy and Electrophysiology of the Retina."

Richard Paul Kosman, B.A.
Dix Hills, New York
"Crystal Structure of CTP-Ligated T State Aspartate Transcarbamoylase at 2.5 Å Resolution: Implications ATCase Mutants, the Mechanism of Negative Cooperativity, and the Mechanism of Allosteric Inhibition."
Future Plans: Associate, Biomedical Ventures, D.H. Blair Investment Banking Corporation, New York, N.Y.



London Teaching Award recipient
Carl E. Rosow, M.D., Ph.D.



John T. Potts, Jr. delivers the keynote address.

Please help us to locate the following alumni (listed by year of graduation):

1975	David W. Kurtz
1976	Daniel J. Knighton
1977	Richard N. Gray
1981	Jeffrey S. Dunham
1984	Richard S. Baker
1988	John C. Eagon
	William Rogers
1989	Margaret Baer
	Jody L. Kujovich
1990	David Powell
1992	Steven H. Grund
	Ben Lam Nguyen
	Oscar Rago
	Thomas Dee Wu
1993	Peter Mark Li
	Christopher Leffler
	Heidi Roth

Health Sciences and Technology
Newsletter
MIT E25-519
(617) 258-8759
E-mail: lubien@mit.edu or bjaskela@mit.edu
http://web.mit.edu/course/other/hst/www
Spring/Summer Edition 1996

Editors, Cynthia D. LuBien and Walter H. Abelmann
Editorial Assistant, Barbara J. Jaskela
Photographer, L. Barry Hetherington

Non-Profit Organization
U.S. Postage PAID
Cambridge, MA
Permit No. 54016