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Orchestrating the future of clinical care

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Orchestrating

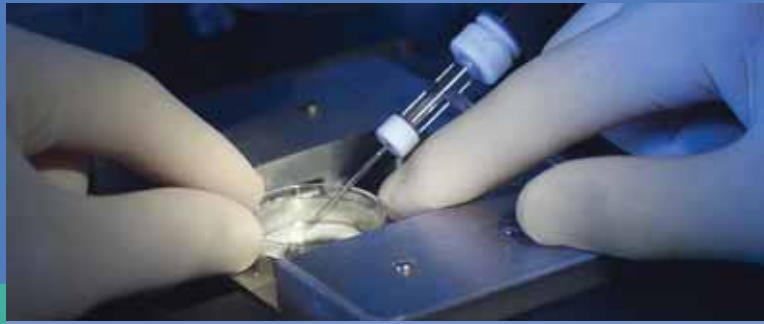
the future of clinical care.

Thomas Jefferson University
2005 Annual Report

Mission and Vision

Cover Photo: Sophisticated microscopes such as the one on our cover are helping Jefferson scientists understand how ion channels – tiny protein pores through which molecules such as calcium and potassium flow in and out of cells – operate.

Members of the voltage-gated ion channel family are crucial to generating electrical pulses in the brain and heart, carrying signals in nerves and muscles. When channel function goes awry, the resulting diseases (including epilepsy, a number of cardiomyopathies and cystic fibrosis) can be devastating. A better understanding of how these channels work is key to developing new drugs to treat ion channel-based disorders.



Mission

Thomas Jefferson University is dedicated to the health sciences. We are committed to:

- Educating professionals in a variety of disciplines who will form and lead the integrated healthcare delivery and research teams of tomorrow*
- Discovering new knowledge that will define the future of clinical care through investigation from the laboratory to the bedside, and into the community*
- Setting the standard for quality, compassionate and efficient patient care for our community and for the nation*

We accomplish our mission in partnership with Thomas Jefferson University Hospital, our education and clinical care affiliate.

Vision

- To be among the premier educators of healthcare practitioners in the nation*
- To define the future of clinical care*
- To be a major center for patient-oriented research and clinical trials*
- To be a knowledge leader in selected areas of basic research*

This is a time of bright promise and new direction for Thomas Jefferson University. Since 1824, Jefferson has been one of the nation's premier educators of healthcare practitioners, a major center for patient-oriented research and clinical trials, and a leading clinical care innovator. Today, we confidently master 21st century challenges.

Vital to our success is Jefferson's Strategic Plan, the scaffolding supporting essential rebuilding and redirection for the enterprise. This plan ushers in dramatic changes in education, research, and clinical care and transforms the university's physical space. We are deeply grateful to Jefferson's faculty, employees and others for their collective energy and commitment in helping to shape this framework for the future.

The core of the new Strategic Plan involves imminent physical changes to Jefferson's campus, the centerpiece of which will be the Dorrance H. Hamilton Medical Education Building, a comprehensive state-of-the-art medical education center and campus green slated to open in 2007.

The Hamilton Medical Education Building will equip the University's medical, nursing, and other healthcare professional students with the most sophisticated educational tools available in clinical care today. It will also enable quadrupling the size of the Dr. Robert and Dorothy Rector Clinical Skills Center, enhancing its capacity to provide simulated hospital operating and emergency room training for tomorrow's professional healthcare teams. The new building will promote a team-building model among doctors, nurses, occupational and physical therapists, social workers, other healthcare professionals and students. It will help us create a central professional campus – an educational hub – that affords everyone on the multidisciplinary medical team an opportunity to learn and work together. (Please see the architectural rendering on page 12.)

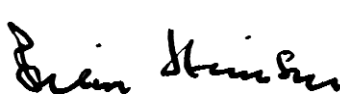
This year, Jefferson Medical College – now the largest private medical school in the nation – expanded enrollment to 255 students and transformed McClellan Hall into a modern

250+ seat state-of-the-art educational auditorium. A proposed ambulatory care facility for clinical practices will centralize physician practices now scattered throughout the campus.

One of the most important steps we can take in shaping a revitalized Jefferson is to recruit outstanding new leaders to join our management team to guide future growth. Judith L. Bachman now fills the newly created post of Senior Vice President for Strategic Initiatives; Steven E. McKenzie, MD, PhD, is Vice President for Research; Bruce Metz, PhD, is now the University's Chief Information Officer, and Cristina Cavalieri, BSN, Esq., joined Jefferson as Vice President and University Counsel. As you read this report, our new Chair of Surgery, Charles J. Yeo, MD, will have joined us from Johns Hopkins. And renowned cancer researcher, Richard G. Pestell, MD, PhD, newly arrived from Georgetown University Medical Center, now heads the Kimmel Cancer Center at Jefferson, providing a strong administrative and informational link among the university, medical college and hospital.

Today, with vigorous leadership and a new strategic direction, we look forward to creating a "community of scholars" – a campus that brings together all members of the Jefferson community, and one where practitioners and scientists learn and work together collaboratively.

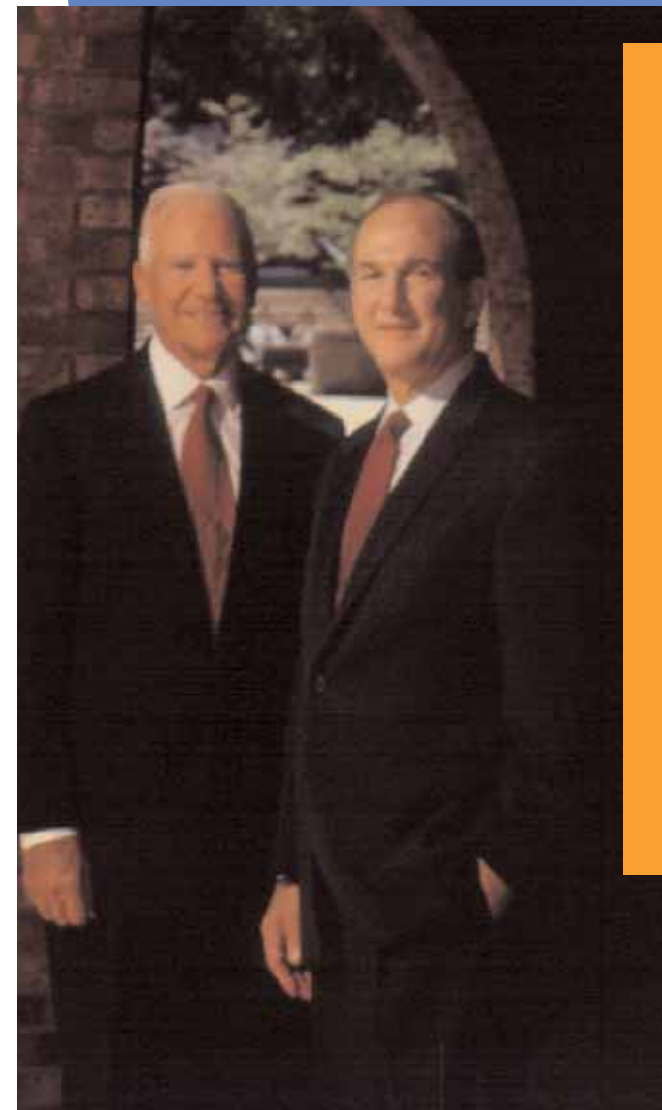
We are very proud of every Jeffersonian – our students, faculty, physicians, researchers, employees, and alumni. Their commitment to Thomas Jefferson University and its strategic agenda will keep us keenly focused on positioning Jefferson as a national leader in healthcare education, research, and clinical care. We dedicate this report to them and to all who benefit from their knowledge, skills, and care.



Brian G. Harrison
Chair of the Board



Robert L. Barchi, MD, PhD
President



Nearly five million Americans are

living with heart failure, the leading cause of cardiovascular mortality. More than 550,000 new cases are diagnosed each year. To meet this rising demand, Jefferson established the Advanced Heart Failure and Cardiac Transplant Center. The Center, serving more than 1,000 patients, provides tailored, aggressive heart failure therapy, while offering patients a single access point for all cardiac needs.

The Center launched its transplant program late last year and is now among the most active heart transplant programs in the Philadelphia region. Under the leadership of Director **Paul J. Mather, MD**, Associate Professor of Medicine at Jefferson Medical College, staff has completed seven orthotopic heart transplants and has expanded to satellite offices in Voorhees, New Jersey and Northeast Philadelphia where patients can receive care for congestive heart failure and physician follow-up previously unavailable elsewhere in these communities.

Jefferson's research scientists are also fighting cardiovascular disease on many new fronts:

Barry J. Goldstein, MD, Professor of Medicine, Biochemistry and Molecular Pharmacology, Jefferson Medical College (JMC) oversees research programs that target mechanisms and regulation of insulin signal transduction, especially the pathophysiology of insulin-resistant disease states, including obesity and Type 2 diabetes.

JMC cardiac researchers led by **Walter J. Koch, PhD**, Director of the Center for Translational Medicine and W.W. Smith Professor of Medicine, have found an enzyme in the blood that could be a potential biomarker for congestive heart failure which affects nearly five million Americans.



Director of the Center for Translational Medicine, **Walter J. Koch, PhD**, and **Andrea D. Eckhart, PhD**, Associate Professor of Medicine, JMC, and Director of the Center's Eugene Feiner Laboratory, at the Center's mouse echocardiogram. These scientists seek to learn the causes of congestive heart failure leading to more effective treatment modalities.

Kumar Sharma, MD, Professor of Medicine and Director of the Center for Diabetic Kidney Disease, JMC, along with scientists from Jefferson and Mount Sinai School of Medicine in New York, conducted a study that has identified a protein that plays a leading part in triggering kidney disease (or diabetic nephropathy) in patients with diabetes. Their findings were reported in the journal *PLoS Medicine*.

Working with Mount Sinai School of Medicine, **Kumar Sharma, MD**, Professor of Medicine, JMC, has identified a protein that plays a leading part in triggering a condition known as diabetic nephropathy and the leading cause of kidney failure worldwide. Findings from the study could lead to developing compounds treat diabetic kidney disease.

Bonita Falkner, MD, Professor of Medicine and Pediatrics, JMC, chaired a National Institutes of Health panel that produced guidelines to treat high blood pressure in children. Her findings promote routine screening for children beginning at age 3.

In an attempt to uncover the molecular roots of hypertension, researcher **Andrea Eckhart, PhD**, Associate Professor of Medicine, JMC, and Director of the Center's Eugene Feiner Laboratory, and her team found that a protein called GRK5 plays an important role in essential hypertension, which affects more than 65 million Americans. Overexpressing a mouse gene that makes the protein led to extreme rises in blood pressure even when the animals were resting. Coincidentally, researchers found that female mice with an overexpressed GRK5-making gene had a lesser blood pressure spike. Their findings lead to questions about the protective effects of estrogen.

Education

Jefferson students and cardiology fellows rotate in the Jefferson Heart Institute's two-year old nuclear cardiology program where they learn to use small amounts of radioactive material to assess the heart muscle for known or suspected coronary artery disease.

Fellowships for the **Jefferson Cardiology Fellowship Program** remain extremely competitive, with more than 500 applications for four available positions this year alone. The 36-month training program enrolls 12 fellows, and the Accreditation Council for Graduate Medical Education has approved Jefferson for a fourth-year fellowship program in interventional cardiology.

Jefferson cardiology residents engage in "mock code" exercises in which the medical team demonstrates its rapid response when a patient's heart stops. Mock code exercises provide active practice and the opportunity to use newly

acquired skills and knowledge while working in multidisciplinary teams. This training in real-time healthcare services will be able to be expanded when the Dorrance H. Hamilton Medical Education Building has been completed.

At **Jefferson College of Graduate Studies**, doctoral candidates have the opportunity to work in some of the most exciting studies in the nation under the direction of leading scientific minds such as new department chairs, **Jeffrey L. Benovic, PhD**, Chair of the Department of Biochemistry and Molecular Biology; **Tim Manser, PhD**, Chair of the Department of Microbiology and Immunology; and **Scott Waldman, PhD**, Chair of Jefferson's new Department of Pharmacology and Experimental Therapeutics in the Department of Radiologic Sciences.

Students at **Jefferson College of Health Professions** train for work in areas such as cardiac sonography and vascular sonography, with job placement rates of 96 percent. The college's Department of Bioscience Technologies prepares students for careers in undergraduate and graduate programs in growth areas such as Biotechnology, Cytotechnology, Medical Technology, or part-time programs in Molecular Biology, Blood Banking, Clinical Chemistry, Hematology, and Microbiology to meet the region's ever-increasing demand for well-trained allied health professionals.

Patient Care

Jefferson University Physician cardiologists are at the forefront of diagnosing heart disease, using advanced non-invasive technologies. In just 30 minutes, nuclear cardiology's state-of-the-art two-head camera with attenuation correction helps diagnose candidates for revascularization or medical therapy.



During a mock code, students in a simulation classroom work over "SimMan," a mechanical patient specifically designed for training students in anesthesia and difficult airway management.

Cancer

The battle against cancer continues.

In the nearly 35 years since the Federal government declared war on cancer, enormous progress has been made in the prevention, diagnosis, and treatment of this disease. Yet for every battle which has been won, many more are still being fought. Thomas Jefferson University is on the front lines of this war. **The Kimmel Cancer Center at Jefferson** – a vibrant, biomedical research and clinical care community – is not only a center of leading-edge cancer research; it is also a focus of hope for the millions of people who are affected.

Richard G. Pestell, MD, PhD, a noted physician-scientist who specializes in hormone-related cancers, has recently been appointed Director of the Kimmel Cancer Center at Jefferson, and is bringing with him a cadre of researchers. Dr. Pestell was previously the Director of the Lombardi Comprehensive Cancer Center at Georgetown University in Washington, DC. With Dr. Pestell's appointment, Jefferson cancer programs are being restructured and the role of the Cancer Center Director expanded.

Our research scientists are uncovering new weapons that they forecast will entirely change the methods of preventing and treating cancer.

Renato Baserga, MD, PhD, who until recently was Interim Director of the Kimmel Cancer Center at Jefferson, remains a member of the center. He received the American Cancer Society's 2004 Scientific Achievement Award. Dr. Baserga's lifetime of accomplishment includes the discovery of the importance of the IGF-1 receptor in cancer. Targeting this receptor, which helps govern growth in most human cell types, is now the focus of intense study by cancer researchers around the world. After removing IGF-1 receptors in cancer cells, Dr. Baserga observed that the cells self-destructed. Pharmaceutical companies sense the logic in drug development to target the IGF-1 receptor to kill cancer cells without the toxicity of other therapies.

The groundbreaking T-cell research of **Bice Perussia, MD**, and **Lawrence C. Eisenlohr, PhD, VMD**, Professors of Microbiology and Immunology at

JMC, holds particular promise for individuals with various leukemias and immune-related diseases.

Researchers, led by **Takami Sato, MD**, the Hasumi Associate Professor of Medicine at JMC, working with **Kevin Sullivan, MD**, Professor of Radiology, have shown good results from an early clinical trial of a novel treatment for melanoma of the eye that has spread to the liver. Immuno-embolization blocks off the hepatic artery, the major artery feeding the liver, cutting off oxygen to liver tumors.

The **Molecular Imaging Center** is Jefferson's first state-of-the-art small animal molecular imaging facility. With advanced technology, Jefferson's radiologist researchers can non-invasively image animal models of cardiac disorders, neurological diseases, malignant and benign tumors, and other medical conditions. **Mathew L. Thakur, PhD**, Professor of Radiology, was awarded an NIH grant to examine Cu-64 PET imaging of breast cancer oncogene expression. The imaging center brings Jefferson to the forefront of the burgeoning molecular imaging field to enhance care for our patients.

Education

In anticipation of the implementation of the National Boards Step 2 Clinical Skills examination, **Jefferson Medical College** conducted its first "high stakes" Objective Structured Clinical Examination (OSCE). Jefferson's students performed extremely well in meeting the rigorous standards set by the faculty. All Jefferson students are now required to pass the OSCE as a part of their course of study.

Reorganization of oncology services with three oncology departments now centralized under the Associate Dean for Cancer Programs strengthens education and training opportunities for our medical students.

Jefferson College of Health Professions expanded its offerings to include Radiation Therapy and Medical Dosimetry. The college now offers a full range of imaging modalities, educating students in both diagnosis and treatment of disease. For students seeking to enter the field of radiologic sciences, the advantages Jefferson offers are without peer. For instance, we were one of the earliest in the nation to be accredited by the Joint Review Committee on Education in Radiologic Technology – the only agency in the field recognized by the U.S. Department of Education.



Richard G. Pestell, MD, PhD, has been appointed Director of the Kimmel Cancer Center at Jefferson, Professor and Chair of the newly created Department of Cancer Biology, Associate Dean for Cancer Programs at Jefferson Medical College and Vice President for Oncology Services at Thomas Jefferson University Hospital.

Jefferson College of Graduate Studies continues to expand its research in the areas of molecular and cellular biology, with more than 600 active research programs receiving approximately \$150 million in external research and training support. Interdepartmental research units, such as the Jefferson Institute of Molecular Medicine and the Kimmel Cancer Center at Jefferson, continue to promote a multidisciplinary approach to biomedical research.

Patient Care

In addition to their focus on research, Jefferson's world-class cancer researchers are also deeply committed to helping the next generation of scientists bring the war on cancer that much closer to victory.

For example, Jefferson's head and neck surgeons, neurosurgeons and radiation oncologists are using Novalis® Shaped Beam Surgery™ – the most advanced radiation technology available anywhere in the world today – to give new hope to patients with once-untreatable tumors in the brain and spine.

Jefferson University Physician and principal investigator **Neal Flomenberg, MD**, Professor of Medicine, JMC, led a Kimmel Cancer Center at Jefferson clinical trial that concluded that a new drug may help patients with cancer mobilize the cells necessary to restore their blood-forming system after high-dose chemotherapy. They found that patients with multiple myeloma or non-Hodgkin's lymphoma who received the drug AMD-3100 along with the standard drug G-CSF had more stem cells available for transplantation. The greater number of available stem cells, the more likely transplantation will be successful. Dr. Flomenberg directs the Bone Marrow Transplant Program at Jefferson, which celebrated the 10th Anniversary of its first transplant and is rapidly approaching completion of 500 successful transplants.



A long-term goal of the Kimmel Cancer Center at Jefferson's Zebrafish Laboratory, directed by Shiu-Ying Ho, PhD, Professor of Microbiology and Immunology, is to better understand the role of lipid mediators in the normal vertebrate embryo and their influence on intestinal tumor formation by taking advantage of the unique characteristics of the zebrafish.



A clinical rotation in dosimetry at Jefferson affiliate Christiana Care's Helen F. Graham Cancer Center rounds out Jefferson College of Health Professions' student Yves Lindo's training. Yves and dosimetrist Jodie Noonan take a moment from their work to enjoy the beauty of the hospital's DuPont Garden and pond.



Mitchell Machtay, MD, Associate Professor and Vice Chair of Radiation Oncology and Director of the department's clinical research, has served as Deputy Group Chair of the Radiation Therapy Oncology Group (RTOG), a leading National Cancer Institute-supported group conducting clinical trials, since 2000.



Renato Baserga, PhD, (above) Professor of Microbiology and Immunology, discusses a project in the laboratory with Mingli Liu, Research Fellow, Kimmel Cancer Center at Jefferson. Over the next five years, Jefferson will be investing further effort into laboratory studies to determine which targeted drugs are best used with what combination of conventional therapies, and to identify the optimal doses and appropriate sequence. Underlying Jefferson's investigation is the desire to understand the biological underpinnings and microenvironment of tumors to determine what makes some sensitive and others resistant to various cancer regimens. The goal is to find combined modality treatment with radiation therapy that most effectively discourages tumor growth and proliferation, with the least side effects, cell toxicity and drug resistance complications.



Irving M. Shapiro, PhD's orthopaedic research team is regenerating spine cells in an oxygen-deprived environment similar to the body's own. Equipment in the background allows researchers to insert their hands to work without introducing oxygen to the cell-friendly environment. Their research offers promise to many who experience pain and disability from degenerative spinal disease.

Teamwork is what today's medicine is all about. Vijay M. Rao, MD, Chair of Radiology, reports that Radiology's musculoskeletal group published extensively, received a contract to be the independent core lab to review images for an industry-sponsored lumbar spine fusion device, and became the principal investigator of an NCI-funded cooperative group study using radio-frequency ablation on bone metastases.

Back pain and orthopaedic problems

rank among the most common reasons adults visit a doctor. For some, these chronic ailments cause significant impairment, keeping them from engaging fully in their daily activities.

Jefferson has made notable advances in promoting better back, knee, and joint health. And Thomas Jefferson University physicians and researchers are helping to maintain this reputation for quality care with their breakthrough discoveries. With our clinical partner, Thomas Jefferson University Hospital, ranked the top and only hospital in Philadelphia for orthopaedic care by *U.S. News & World Report*, our exceptional combination of groundbreaking research and leading-edge patient care provided by the outstanding orthopaedic surgeons of the **Rothman Institute at Jefferson** contributes to Jefferson's reputation as a center of orthopaedic excellence.

Zeroing in on Bone and Connective Tissue Disorders

An 11-member orthopaedic research team headed by **Irving M. Shapiro, PhD**, Professor of Orthopaedic Surgery at Jefferson Medical College and Director of the Division of Orthopaedic Research, is dedicated to understanding the cellular and genetic makeup of normal and abnormal bone and cartilage. Investigating the molecular basis for disk degeneration using organ culture models, orthopaedic researchers are working to pinpoint which genes cause regeneration and to develop bone-marrow-derived stem cells capable of repopulating and regenerating disks. Their discovery that spinal disk cells grow better in an oxygen-deprived environment opens the door to growing disk replacements in the laboratory.

Jefferson orthopaedic researchers are also working to improve orthopaedic implant materials so replacement hips and knees will last for 30 or 40 years, and to unravel the causes of degenerative diseases of the skeleton, such as arthritis and osteoporosis.

In addition, Jefferson's orthopaedic researchers are focusing on finding the genes involved in formation of the spine, and are working to prevent scoliosis. Other research projects seek to identify the molecular changes as bone and cartilage age and to discover how calcium delivery to bones can be improved by hormones and vitamin D.

In complementary research, **Eugene R. Viscusi, MD**, Assistant Professor of Anesthesiology at Jefferson Medical College, has been testing the use of DepoMorphine, a time-release drug, as a valuable new option for managing postoperative pain following hip replacement surgery. Dr. Viscusi directs Jefferson's Acute Pain Management Service, which plays a key role in promoting a multidisciplinary approach to pain management. The program involves educating nurses, pharmacists, and physicians from many services.

Education

Jefferson Medical College's Objective Structured Clinical Exam (OSCE) ensures that our students meet the highest medical standards in all clinical services including orthopaedic surgery. The Clinical Skills Center uses trained standardized patients, analog and digital recording equipment, and computer tracking and database systems to assess all students' knowledge and skills. The program is an integral part of all health professionals' education and skill training at Jefferson.

Through its **Future Docs** program, Jefferson Medical College's Office of Diversity and Minority Affairs reaches out to high school students in the Philadelphia area who express a sincere interest in pursuing a medical career. Through a series of visits to Jefferson Medical College during which they meet with medical school representatives, physicians and medical students, these aspiring high school students get the information and resources they need to ensure their success as college pre-medical students.

Curricular Changes at the **Jefferson College of Graduate Studies** now place all PhD students, from all programs, in a new comprehensive core curriculum



course, entitled "Foundations of Biomedical Science," where faculty from across the college teach an integrated introduction to the core fields of biochemistry and molecular biology, cell biology and genetics.

To meet the growing need for physical therapists, the **Jefferson College of Health Professions** has expanded Jefferson's entry-level Physical Therapy program to that of a clinical doctorate (DPT). This post-baccalaureate program not only produces experts in examining and treating musculoskeletal and neuromuscular problems but also equips physical therapists with skills to prevent illness and maintain good health and fitness. There are now 107 students enrolled in the college's physical therapy programs.

Patient Care

At Reconstructive Spine Services at the Rothman Institute at Jefferson Co-directors **Todd Albert, MD**, Professor and Vice Chair, Orthopaedic Surgery, and **Alexander R. Vaccaro, MD**, Professor of Orthopaedic Surgery, are testing an artificial disc, composed of metal and plastic, which has produced very favorable results as an alternative to spinal fusion. Jefferson orthopaedic surgeons performed their first procedure using the artificial disk this year offering relief for painful degenerated disks.

Jouni Uitto, MD, PhD, Chair of Dermatology and Cutaneous Biology, working with junior faculty researcher, Qiujie Jiang, MD, PhD. "Much of the current research on connective tissue diseases is predicated on the development of animal models that recapitulate the clinical phenotypes," Dr. Uitto says. "That's really where the state of the art is now in this field of research – creating and studying preclinical disease models."

Jefferson can boast of having the first division of neurology in the United States and a long tradition of excellence in both clinical neurology training and research. Today, Jefferson students benefit from leading programs and centers in both the Departments of Neurosurgery and Neurology at Jefferson Medical College and an astounding array of new technology.

The **Department of Neurology** provides a broad educational approach that promotes clinical and research strengths in general neurology. Neurologists and neuroscientists in the Department of Neurology, including 14 new neurologists, are engaged in extensive research supported by NIH and other agencies to find the cause and better treatment for patients with a variety of neurological disorders including multiple sclerosis (MS), epilepsy, migraine headache, movement disorders, neuromuscular diseases and stroke.

At the **Farber Institute for Neurosciences**, located at the Jefferson Hospital for Neuroscience (JHN), scientists focus on basic research into the underlying causes of degenerative nervous system diseases such as Alzheimer's disease, Parkinson's disease, and amyotrophic lateral sclerosis (ALS). The Farber Institute, a multidisciplinary neurosciences research center, continues to build on already-established Jefferson strengths in these fields, while generating new and revitalized research programs in others.

As principal investigator of a four-year, \$3.5 million grant from the Pennsylvania Department of Health to support a Center of Excellence on Neurodegenerative Diseases at the Farber Institute for Neurosciences, Director **Samuel H. Gandy III, MD, PhD**, heads a team seeking answers to questions that resonate for every family. How can a family tell if a loved

one is in the beginning stages of Alzheimer's disease? Are there changes individuals can make in their lifestyle to reduce or perhaps delay the effects of the disease? What can caregivers do to lessen their burden? The new Jefferson center, co-directed by **Barry Rovner, MD**, and **Laura N. Gitlin, PhD**, will work in collaboration with the Philadelphia Corporation for Aging to conduct several research projects, each focusing on a different aspect of Alzheimer's disease.

Scientists, including **Dr. Gandy** and **Steve Pedrini, PhD**, a postdoctoral fellow in Neurology at Jefferson Medical College and the Farber Institute for Neurosciences, have taken another step in understanding the potential effects of anti-cholesterol drugs on Alzheimer's disease. They have identified a biochemical pathway that explains the activity of statins, particularly their ability to break down an early form of the protein amyloid that clusters and forms sticky plaques in the brain of patients with Alzheimer's.

Education

As one step in setting up the university's pioneering research, every fourth year medical student at **Jefferson Medical College** now takes a mandatory Emergency Medical clinical clerkship. This experience exposes Jefferson's future doctors and scientist to emergency medical patient care and research in many instances where serious neurological damage has occurred to patients.

Raymond Regan, MD, Associate Professor in the Department of Emergency Medicine, JMC, and his postdoctoral assistant, **Luna Benvenisti-Zarom, MD**, were recently awarded an American Heart Association grant for their groundbreaking research on a project titled "Optimizing Heme Oxygenase Activity after CNS Hemorrhage by Adenoviral-mediated Gene Transfer."

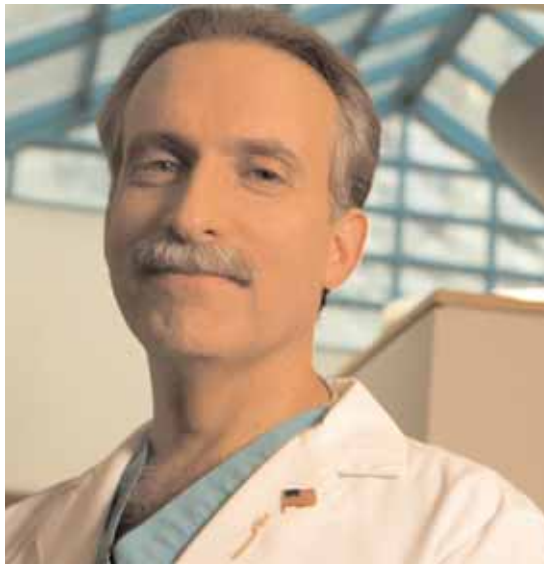
Jefferson College of Graduate Studies Dean, **James H. Keen, PhD**, launched the first Annual Presidential Lecture to be presented annually to showcase the work of the Jefferson scientific community. In the Inaugural Presidential Lecture entitled "Musings on Ion Channels, Mutations and Disease," University President **Robert L. Barchi, MD, PhD**, reflected on his experience in identifying and unraveling the mysteries of ion channels and how their mutations cause disease. Dr. Barchi expressed his belief that the most exciting and productive studies include cross-fertilization between researchers and clinicians and that this exchange was the unique treasure of academic medical centers.

At Jefferson Hospital for Neuroscience, **A.M. Rostami, MD, PhD**, Professor and Chair of Neurology, an internationally renowned expert in the field of multiple sclerosis and neuroimmunology, leads an expert group of basic and clinical research neuroscientists working to find a cure for multiple sclerosis (MS). Recently, Dr. Rostami and Guang-Xian Zhang, MD, PhD, Assistant Professor of Neurology, and their team found that glucosamine, an over-the-counter natural product that is touted to help with joint and cartilage problems associated with arthritis, helps improve neurological deficit in a model of MS. They believe it may also be useful in the treatment of patients with MS.

The radiologic sciences play a critical role in neurology and neurosurgery, helping physicians to diagnose and treat a host of neurological illnesses. This year, **Jefferson College of Health Professions'** Department of Radiologic Sciences' MRI Program was among the first in the nation to submit an application for programmatic accreditation with the Joint Review Committee on Education in Radiologic Technology. The college also graduated its first students with the Bachelor of Science degree in Health Services Management, a part-time BS program for working adults offered through the Department of General Studies.

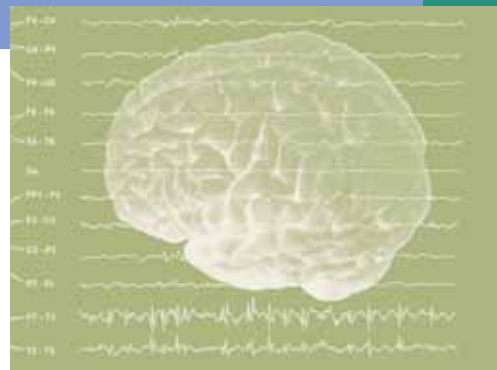
Bench-to-Bedside Care for Patients

Jefferson neuroscientists collaborate on many research projects designed to improve the quality of life for patients with debilitating neurological disorders such as MS, Alzheimer's disease, epilepsy, Parkinson's disease and stroke.



Robert H. Rosenwasser, MD, Professor and Chair of Neurosurgery and a world-renowned physician specializing in cerebrovascular neurosurgery and interventional neuroradiology, continues to solidify Jefferson's reputation in stroke with breakthrough procedures such as coiling for aneurysms and arteriovenous malformations (AVMs). Research is directed toward innovative approaches in treating aneurysms and gaining a better understanding of what is going on in the cellular level inside the aneurysm after coiling.

An electroencephalogram (EEG) of benign focal epilepsy of the centrotemporal area in an 11-year-old girl. Recorded during the phase of light slow sleep, the EEG is printed over a 3D MRI image of the brain in side view.



Farber Institute for Neurosciences Director Samuel H. Gandy III, MD, PhD, an internationally recognized expert in molecular biology and Alzheimer's drug discovery, has made it a priority to establish the Farber Institute as a leading training center in molecular neuroscience. A new interdisciplinary PhD Program in Neuroscience, jointly established by the Jefferson College of Graduate Studies and the Institute, provides hands-on neuroscience training with internationally recognized scientists in state-of-the-art research facilities. Elisabeth J. Van Bockstaele, PhD, Associate Professor of Neurosurgery and Pathology, Anatomy and Cell Biology, directs the program. Here, Dr. Gandy confers with technician Emily Sluzs.



David B. Nash, MD, MBA, the Dr. Raymond C. and Doris N. Grandon Professor of Health Policy, has gained an international reputation for his work in outcomes management, medical staff development and quality-of-care improvement.



Barry Rovner, MD, Professor of Psychiatry and Human Behavior and Director of the Division of Geriatric Psychiatry at Jefferson Medical College, co-directs – with Laura Gitlin, PhD – the university's Center of Excellence on Neurodegenerative Diseases at the Farber Institute for Neurosciences. Dr. Gitlin is also Director of the Center for Applied Research on Aging and Health.

Jefferson's **Department of Health**

Policy takes great pride in preparing physicians at all levels of training to meet the challenges of a dynamic healthcare environment. The department's chair, **David B. Nash, MD, MBA**, the Dr. Raymond C. and Doris N. Grandon Professor of Health Policy, has gained an international reputation for his work in outcomes management, medical staff development and quality-of-care improvement. Under his leadership, the department contributes to the quality, safety, and cost-effectiveness of health care. Working shoulder to shoulder with government policy makers, providers, payers, and other stakeholders, the department seeks to translate individual patient data into population health information.

Community Outreach

Students at Jefferson's three colleges are committed to helping underserved populations in our community. Their activities range from collecting warm clothing for the homeless and books for needy children to going out in the community to provide health care and literacy programs to those most in need.

Through **JeffHOPE** (Health, Opportunity, Prevention and Education), a student-run organization of **Jefferson Medical College** and the **Jefferson College of Health Professions**, Jefferson students and faculty provide dignified, accessible and top-quality health care to the city's homeless and underserved populations. At the same time, the health professional students are given an opportunity to serve the community while learning clinical skills and working as members of interdisciplinary teams in health clinics such as Prevention Point Philadelphia Center, the Eliza Shirley Shelter House – an Emergency Center for women and their children, and Acts of the Apostles Shelter for women and children.

Students at **Jefferson College of Graduate Studies** formed the Graduate Student Association (GSA), in part, to link with the college's surrounding communities. The GSA has worked with the Franklin Learning Center, a local high school with a science program, and participates in the American Cancer Society's "Making Strides Against Breast Cancer" walk each fall.

To assist our many international students and researchers, Jefferson's Office of International Affairs works closely with all University divisions and departments to facilitate exchange and to offer orientation to international visitors.

Rajnish Mago, MD, Assistant Professor of Psychiatry and Director of Mood Disorder Division helps patients, especially those who have medical illness, manage depression beyond the office setting.

Education

At **Jefferson Medical College**, residents are key players in Jefferson's role of providing health services. At the college, the quality of that care is supported by creating a balance with the duty hour requirements of the Accreditation Council for Graduate Medical Education (ACGME) and our residents' need to hone their skills and their effectiveness. Dean **Thomas J. Nasca, MD**, is very involved in the impact of sleep upon learning.

Jefferson's commitment to producing health professionals best suited for their roles in the community is evidenced by initiating in 1969 and continuing its commitment to the **Jefferson Longitudinal Study**. The Middle States accreditation team said, "The Center for Research in Medical Education and Health Care and Jefferson Medical College are to be commended for their academic interest in outcome data, responsiveness to faculty and department needs, and clear use of data to modify the curriculum and teaching environment..." More than 90 percent of residency program directors confirmed among other things that JMC graduates' performances lived up to the respective hospital's expectations.

Jefferson College of Graduate Studies now offers a Master of Science Program in Public Health providing graduate training, research, and service opportunities in the primary disciplines of public health: biostatistics, epidemiology, health services administration, health education/behavioral science, and environmental science. The principal aim is to prepare graduates to assume or continue professional and leadership roles as public health



Jefferson Medical students receive their white coats.

practitioners in research, policy development, or teaching in the challenging healthcare environment.

At **Jefferson College of Health Professions** the Department of General Studies hosted Jefferson's second Summer Science program in biomedical sciences for high school students. Bringing together faculty from Jefferson Medical College's Department of Anatomy, Pathology and Cell Biology and Jefferson College of Health Professions' Department of Bioscience Technologies, the college presented a program in research techniques pertaining to molecular biology, cell biology and protein chemistry, pathology and anatomy and cancer biology. Hopefully, this initiative will lead some of these students to further education in science related fields.

The **PACE** (Plan A College Education) advanced admission program allows high school seniors committed to a health professions career to apply to Jefferson College of Health Professions. If accepted, admission is guaranteed provided students complete prerequisites and maintain the appropriate grade point average.

The YES Shelter Outreach Program, directed by R. Patrick McManus, MD, Clinical Assistant Professor of Family Medicine, received grants from the Goldsmith-Greenfield Foundation, Inc., the Huston Foundation, and Civic Foundation, Inc. to help homeless teens.

The Dorrance H. Hamilton Building, the healthcare education building of the future, and a campus green will soon be a reality on Jefferson's campus.



Senior management at Jefferson is

moving forward rapidly to put in place the components necessary to fulfill Jefferson's vision and implement our strategic agenda while strengthening ties between the hospital and the university. The energy generated from the planning process has exploded into activity.

Planning

New leaders arrived on campus, while others arose from the ranks, to direct departments in research and education and to enhance administration and patient care roles. A campus-wide planning initiative, led by Dr. Barchi and Mr. Lewis and both Boards of Trustees, identified areas of strength as well as areas for improvement. As a result, we developed an agenda to both position Jefferson for the future and create opportunities for Jefferson to reinvent itself.

Strengthening the foundation for this metamorphosis was the consolidation of fundraising for the Hospital, the University and Alumni Office under The Jefferson Foundation and the development of McClellan Hall as a state-of-the-art auditorium to serve our students and thus facilitate the expansion of the medical school to serve 255 students this year.

Building a Revitalized Campus

At the same time, having identified the University's strengths in education, a successful building campaign, anchored by a generous gift from Mrs. Dorrance H. Hamilton, allowed early groundbreaking for the facility named for Mrs Hamilton. The healthcare education building of the future and a campus green will soon be a reality on Jefferson's campus. Here, healthcare education will take place in multidisciplinary teams just as real-time practice demands, making the Jefferson education experience among the most advanced in the nation.

Restructuring Financial Operations

Recently, **Richard J. Schmid**, the University's Vice President for Finance and Chief Financial Officer, implemented important staff changes to strengthen Jefferson's financial position. **Scott Ravenfeld** is now Senior Director of Finance for Jefferson Medical College, holding responsibility for the financial operations within the college. **Angelo Veneziano** now directs financial operations of Jefferson College of Health Professions, while **Alfred Salvato** serves as Associate Vice President for Finance and Treasurer of the University.

Enhancing Operations at JMC and JUP

As part of strengthening the operations of Jefferson Medical College and to create a more focused administrative structure, Dean Nasca appointed **John Ogunkeye** to the newly created position of Chief Operating Officer for the Medical College with oversight of the college's infrastructure. This appointment is designed to enhance the alignment of the college's business functions with that of Jefferson University Physicians (JUP) and the University.

At JUP, Mr. Ogunkeye continues to serve as Executive Director and Vice President for Business Affairs, where he works closely with JUP's Medical Director, **William M. Keane, MD**, and the Executive Committee. Dr. Keane is also the Herbert Keen, MD, Professor and Chair of Otolaryngology-Head and Neck Surgery. Their goals are to shape the strategic direction of the practice plan in coordination with the overall strategic plan and goals of the University and Hospital.

Research Initiatives

Recently, restructuring of cancer services under **Richard G. Pestell, MD, PhD**, as Director of the Kimmel Cancer Center at Jefferson and as the hospital's Vice President for Cancer Services, links the university and hospital for information and ease of operation, reinforcing Jefferson's plan to become a National Cancer Institute-designated comprehensive cancer center.

It is an exciting time to work at Jefferson and an even more exhilarating time to participate in leading this outstanding institution.



(above) Judith Bachman, Senior Vice President for Strategic Planning and Steven E. McKenzie, MD, PhD, Senior Vice President for Research.

(above right) JUP's Medical Director, William M. Keane, MD, is also the Herbert Keen, MD, Professor and Chair of Otolaryngology-Head and Neck Surgery.

(right) JUP's Executive Director and Vice President for Business Affairs John Ogunkeye is also Chief Operating Officer for the Medical College.



Financial Review

How We Received Our Revenues

Physicians' professional services 36.7%

Grants and contracts 24.3%

Tuition and Fees 10.1%

Sales from auxiliary activities 17.8%

Endowment payout 1.9%

State appropriations 2.0%

Contributions 1.2%

Other sources 6.0%

How We Spent Our Revenues

Salaries and wages 51.9%

Employee and faculty benefits 12.5%

Depreciation 3.5%

Heat, light and power 2.9%

Debt service 1.1%

Other 28.1%

THOMAS JEFFERSON UNIVERSITY

June 30, 2005 and 2004 (\$ in Millions)

	2005	%	2004	%
How We Received Our Revenues				
Physicians' professional services	190.4	36.7%	178.1	35.8%
Grants and contracts	125.9	24.3%	133.9	26.9%
Tuition and Fees	52.5	10.1%	47.0	9.4%
Sales from auxiliary activities	92.1	17.8%	86.4	17.4%
Endowment payout	9.8	1.9%	7.8	1.6%
State appropriations	10.4	2.0%	10.1	2.0%
Contributions	6.4	1.2%	3.7	0.7%
Other sources	31.3	6.0%	30.4	6.1%

Operating Revenues	\$518.8	100.0%	\$497.4	100.0%
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How We Spent Our Revenues

Salaries and wages	267.3	51.9%	259.0	52.1%
Employee and faculty benefits	64.5	12.5%	59.6	12.0%
Depreciation	17.8	3.5%	17.7	3.6%
Heat, light and power	15.0	2.9%	14.8	3.0%
Debt service	5.9	1.1%	6.1	1.2%
Other	145.0	28.1%	139.9	28.1%

Operating Expenses*	\$515.5	100.0%	\$497.1	100.0%
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Subtotal	\$3.3		\$0.3	
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Non-operating Gains/(Losses), Net	\$13.3		\$14.2	
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Tot Non-op loss Net Income/(Loss)	\$16.6		\$14.5	
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* Includes depreciation expense on academic facilities
of \$17.8 million and \$17.7 million for the years ended 2005 and 2004, respectively.

A financial report of Thomas Jefferson University
is available upon request. Please send request to:

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Biochemistry and Molecular Biology

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Cancer Biology

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Dermatology and Cutaneous Biology

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Otolaryngology – Head and Neck Surgery

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departments:

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Microbiology & Immunology

Timothy Manser, PhD

Nursing

Mary G. Schaal, EdD, RN

Occupational Therapy

Janice Burke, OTR/L, PhD, FAOTA

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Pharmacology and Experimental Therapeutics

Scott Waldman, MD, PhD

Physical Therapy

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Occupational Therapy

Janice Burke, PhD, OTR/L, FAOTA

Physical Therapy

Penny G. Kroll, PhD, PT

Radiologic Sciences

Frances Gilman, MS, RT (R) (CT)(MR)(CV)



Meet the Kimmel Cancer Center at Jefferson team – outstanding professionals who teach, discover and provide quality, compassionate health care.



An Academic Health Center
Founded 1824

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