Dear Colleagues and Friends:

We have the privilege of working with the highly talented individuals who conduct research as part of our academic endeavors.

These dedicated physicians and bioscientific staff play an important role in the life of our organization, particularly since research, coupled with medical education, is at the core of the System’s academic mission.

The scope and quality of our research efforts are reflected in measurements we are proud to share.

Funding

- Researchers are engaged in more than 1,700 studies;
- Researchers in 2011 were awarded $64.5 million from external and internal sources;
- Henry Ford ranked first in non-university based Michigan health systems for funding from the National Institutes of Health;
- In 2011 Henry Ford Health System: ranked fourth in the state of Michigan in NIH funding; and ranked 211 out of 1,167 institutions receiving NIH grant awards;
- Henry Ford Health System’s 2011 research funding exceeded the prior years funding by 1.5% or nearly one million dollars, despite the challenges of the country’s economic crisis.

Scope of Research Awards

Our researchers programs are focused on: Bone and Joint, Cancer, Heart, Vascular and Kidney, Immunology, Neuroscience, Population, Health and Healthcare

Whether it is two NIH Program Project grants totaling $4.5 million in the System’s Department of Hypertension and Vascular Research, or $1 million of NIH funding in the Department of Neurology Research for the study of stroke, or $5.3 million in studies on asthma, allergy and cancer prevention in the Department of Public Health Science, the System’s research excellence secures the grant.

Research staff

- Eighty full-time scientists engage in translational research
- Many of the 1,000 Henry Ford physicians lead or participate in clinical trials
- Other researchers focus on: disease screening, prevention and management, health outcomes, disparities in care, health economics

Researchers collaborate with members of the Henry Ford Medical Group and Health Alliance Plan, as well as with fellow researchers and health care research networks in other states.

Economic Engine

- Research activities continue to serve as an economic engine for Detroit and Michigan
- Federal dollars supporting the local economy
- Physicians and scientists relocate here from all around the world.
- Partnership with Tech Town and Wayne State University

In 2012 and beyond, leveraging our strengths in clinical innovation and care coordination and implementing new opportunities for academic partnership and facilities will continue to be a System priority

Our mission is clear: provide the safest, highest-quality, innovative and most cost-effective health care to all those who access our System. Research supports our mission in countless ways.

We hope you’ll enjoy learning more about the breadth and depth of the System’s research offerings in the following pages.

Best wishes,

Nancy M. Schlichting
Chief Executive Officer
Henry Ford Health System

Mark Kelley, M.D., M.A.C.P.
CMO & EVP, Henry Ford Health System
and CEO, Henry Ford Medical Group

Margot C. LaPointe, Ph.D.
Vice President for Research

Henry Lim
Senior Vice President for Academic Affairs
Chair, Dept. of Dermatology
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Researchers at Henry Ford Health System are engaged in more than 1,700 active scientific studies. Research is strongly supported by leadership and conducted by teams of dedicated and accomplished physicians, scientists and research professionals. Henry Ford Health System’s research program is the largest, most well-funded and successful of all non-university health systems in Michigan. In 2011, Henry Ford ranked 224th of more than 2600 institutions receiving National Institutes of Health (NIH) funding from the United States government. The System received more than $53.6 million in externally awarded grants, contracts and sub-contracts, $24M of which was awarded by the NIH.

Henry Ford Hospital, located in Detroit, is the major academic and research center of Henry Ford Health System. Since 1915, the research professionals at Henry Ford Hospital have focused their efforts on understanding the mechanisms of disease. Their research has led to the development of new, viable treatment options, enhancing and prolonging the lives of people worldwide. Much of the research conducted at Henry Ford Hospital is translational in nature, spanning from bench to bedside. A team of 80 bioscientific staff performs studies that range from whole-animal physiology to cell and molecular biology to bioengineering. Research also emphasizes studies that can directly improve patient care. Research teams from the Department of Public Health Sciences and the Center for Health Policy and Health Services Research collaborate with members of the Henry Ford Medical Group as well as researchers in other states to enhance the quality of health care nationwide. Henry Ford scientists and physicians also participate in and lead many clinical trials that determine how to best treat disease.
Research at Henry Ford Hospital is funded by a number of sources. In addition to the National Institutes of Health (NIH), funding is received from the Centers for Disease Control and Prevention (CDC); Department of Defense; NASA; numerous foundations, state and local agencies; and the pharmaceutical and medical device industries.

Henry Ford’s research enterprise ranks in the top 10 percent of all institutions receiving NIH funding from the federal government. When compared to the research programs of Michigan institutions, it ranks fourth in funding, after the University of Michigan, Wayne State University and Michigan State University. In addition to external funding, the health system supports its research enterprise through its Foundation Endowment.

Some of the highlights of Henry Ford’s NIH-funded research include:

**NIH Program Project Grants**

National Heart, Lung and Blood Institute to the Hypertension and Vascular Research Division  
Vasoactive Autacoids in Blood Pressure Regulation (P.I.: O.A. Carretero, M.D.)

National Heart, Lung and Blood Institute to the Hypertension and Vascular Research Division  
Blood Pressure Regulation: Novel Roles for the Kidney (P.I.: J. L. Garvin, Ph.D.)

National Neurological Disorders and Stroke Institute to the Department of Neurology  
Center for Stroke Research (P.I.: M. Chopp, Ph.D.)

National Institute for Allergy and Infectious Diseases to the Department of Public Health Services  
Pets and the Infant Microbiome: Effect on Immune Maturation & Atopic Asthma (P.I.: C.C. Johnson, Ph.D.)

**Partial list of our NIH R01 Grants**

- National Institute on Aging to the Department of Neurology  
  MSCs Induce Brain Plasticity via tPA (P.I.: M. Chopp, Ph.D.)

- National Institute on Aging to the Department of Neurology  
  Neurorestorative Therapy of Stroke with Agents that Increase HDL (P.I.: J. Chen, M.D.)

- National Cancer Institute to the Department of Neurology  
  MRI Biomarkers of Response in Cerebral Tumors (P.I.: J.R. Ewing, Ph.D.)

- National Neurological Disorders and Stroke Institute to the Department of Neurology  
  Imaging Cell Based Treatment of Traumatic Brain Injury (P.I.: Q. Jiang, Ph.D.)

- National Neurological Disorders and Stroke Institute to the Department of Neurology  
  tPA, White Matter and Cell Therapy for Stroke (P.I.: Y. Li, M.D.)

- National Institute on Aging to the Department of Emergency Medicine  
  Treatment of Stroke in Young and Aged Rats using Thymosin beta4 (P.I.: D.C. Morris, M.D.)

- National Neurological Disorders and Stroke Institute to the Department of Neurology  
  PDE5 as a Therapeutic Target for Peripheral Neuropathy in Diabetic Mice (P.I.: L. Wang, M.D.)

- National Neurological Disorders and Stroke Institute to the Department of Neurology  
  MicroRNAs and Neurogenesis after Stroke (P.I.: Z.G. Zhang, M.D.)

- National Institute of Mental Health to the Pulmonary Division  
  Longitudinal Study of Predisposition and Life Events in Triggering Insomnia (P.I.: C.L. Drake, Ph.D.)
On an annual basis Henry Ford receives more than $53 million in external funding and spends more than $10 million from the System Endowment to support HFHS scientists, physicians and research infrastructure.
## 2011 External Research Funding

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<td>BONE AND JOINT</td>
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Hypertension Research

High blood pressure (hypertension) is the most widespread form of cardiovascular disease and afflicts more than one of every four adults in this country, with African Americans and the elderly at significant risk. Hypertension is only exceeded by all forms of cancer combined as a cause of death in the United States. It is a major risk factor for stroke, heart attack, congestive heart failure, kidney failure and vascular disease. Hypertension directly damages the heart, blood vessels and kidneys. In the heart it causes enlargement (hypertrophy) and fibrosis (increased connective tissue) of the left ventricle and atrium, leading to impaired function and irregular heartbeats (arrhythmias). In the vessels of all organs, including the kidneys, hypertension causes increased deposition of connective tissue. This leads to arteriosclerosis/atherosclerosis (hardening of the artery) and renal disease. In the kidney, high blood pressure also damages the units responsible for filtering the blood and the cells that regulate salt and water excretion. This ultimately results in loss of the kidney’s ability to excrete waste products as well as elevated loss of proteins normally found in the blood.

The research in the Hypertension and Vascular Research Division (Department of Internal Medicine) focuses on basic kidney function, how kidney abnormalities increase the prevalence and probability of developing hypertension, and the mechanisms by which hypertension damages the heart, vessels and kidneys. These topics are addressed by studying how:

- Proteins move salt and water in and out of cells.
- Factors constricting or dilating blood vessels contribute to hypertension.
- Inflammation contributes to hypertension-related damage of the heart, vessels and kidneys.
• Reactive oxygen species generated in heart, blood vessel and kidney cells cause hypertension and organ damage.

• The mechanisms by which drugs used to treat high blood pressure, such as angiotensin-converting enzyme inhibitors, provide protection against heart and renal kidney disease in addition to lowering blood pressure.

These studies require the use of state-of-the-art techniques, many of which were developed within the division. These include non-invasive echocardiography to measure heart function, microdissection and microperfusion of renal tubules and blood vessels that are smaller than a human hair, cell culture, molecular biology, and confocal microscopy to study the movement of molecules inside individual cells. Additionally, whole animal physiologic studies are performed using transgenic and gene knockout animal models.

The division is funded by two NIH Program Project Grants, which are multi-investigator efforts. Other funding sources include the American Heart Association, the Michigan Kidney Foundation, and the pharmaceutical industry.

Heart Failure Research

The Cardiovascular Research Laboratory (Division of Cardiology of the Department of Internal Medicine and the Henry Ford Heart and Vascular Institute) conducts research into the causes and novel treatments of heart failure. This disease has reached epidemic proportions, affecting more than five million patients in the United States and more than 23 million patients worldwide. Henry Ford’s laboratory focuses on translational research, which is basic research with a potential for use in humans. Researchers are concerned with understanding the basic mechanisms leading to progression of heart failure and ventricular remodeling (changes in the shape and size of the heart), including the assessment of drugs and devices that may reverse this process.

Ongoing research explores the potential benefits of a family of compounds that preferentially shift the fuel used for energy production in the failing heart from fat to carbohydrates, a process with potential to improve energy production and therefore the pumping function of the failing heart. Additional studies focus on the signaling mechanisms that foster dysfunction of cardiac muscle cells during the development of heart failure, the examination of the flow of small ions like sodium across the cardiac muscle cell membrane, and how abnormalities in this process can lead to fatal arrhythmias. Other studies focus on understanding the role of heart rate reduction in the management of heart failure. Toward this goal, researchers explore the potential role of compounds that inhibit the pacemaker current, reducing the heart rate. Lowering the heart rate in patients with heart failure reduces energy requirements on the failing heart, a benefit that translates into improved pumping function.

Research has also targeted acute decompensated heart failure, a condition reflecting severe exacerbation of the disease. Current investigations are focused on understanding the mechanisms involved in cardiac decompensation and on therapies to improve symptoms and survival. Several novel drugs are being tested for this condition, including compounds that enhance the release of substances such as adenosine into the failing myocardium to help ameliorate ischemia and hypoxia, as well as compounds that indirectly and safely improve function of the acutely failing heart. Novel drugs under investigation include adenosine A1-receptor agonists, nitroxyl donors and stresscopin.

Beyond molecular biology and traditional biochemistry, the Cardiovascular Research Laboratory is focused on developing and testing novel devices for treating heart failure. Such devices include vagus nerve stimulation (VNS) and spinal cord stimulation (SCS). VNS has been shown to markedly improve function of the failing heart and is currently being tested in clinical trials in patients with heart failure. Researchers are also investigating devices that improve the function in heart failure through electrical stimulation of the carotid baroreflex, a technology known as baroreflex activation therapy (BAT). This technology, along with VNS, has been shown to reduce heart rate in heart failure and act as an anti-inflammatory to help improve pumping function.

Heart failure research also explores the use of material made of seaweed (alginites). When injected directly into the heart muscle, alginates help to support the failing muscle by preventing enlargement of the heart and reducing wall stress, which reduces energy expenditure. Alginites are also being tested in the treatment of acute myocardial infarction by preventing enlargement of the left ventricle. This research is supported by the National Institutes of Health and the pharmaceutical industry.
Almost 800,000 Americans are diagnosed with stroke each year, and approximately one-third of them die. Health care costs for stroke exceed $60 billion per year. The Henry Ford Department of Neurology is internationally acclaimed for its research in stroke and neural injury and is the major driving force in the development of restorative neurology. The department has pioneered research in restorative therapy for the treatment of stroke, traumatic brain injury and neurodegenerative diseases using both cell-based and pharmacologic therapies. The goal is to remodel the central nervous system (CNS) to compensate for the injured brain tissue. Researchers have also made major contributions to the development of neuroprotective agents, such as tissue plasminogen activator (tPA), and have been major innovators in the development and use of magnetic resonance imaging (MRI) for understanding neurological disease.

Department of Neurology research has shown that administration of exogenous cells, such as bone marrow mesenchymal cells, cord blood, cord tissue, placental tissue, brain progenitor cells and adult stem cells derived from various organs, greatly improves neurologic outcome after stroke and neural injury. Driving this functional improvement is the remodeling of the CNS, including the generation of new brain cells (neurogenesis), formation of new blood vessels (angiogenesis), and creation of new electrical connections (synaptogenesis). Several pharmacologic agents also have the capacity to enhance recovery from brain injury and may restructure the injured CNS. These include erythropoietin, carbamylated erythropoietin, statins, nitric oxide donors, thymosin-ß4, agents that increase cGMP such as sildenafil and tadalafil, and agents that increase high-density lipoproteins such as niacin and Niaspan. Many of these agents are being tested in clinical trials and show promise for future therapy.

The department’s work in restorative neurology has spawned fundamental research into the mechanism by which cells or drugs induce brain plasticity.
Researchers have published extensively on the molecular mechanisms controlling the generation of new brain cells and blood vessels. In addition, the coupling of neurogenesis and angiogenesis has been studied, demonstrating that restorative therapy establishes a remodeling microenvironment within the compromised tissue that stimulates structural changes and rewiring to compensate for injury. Moreover, this research has demonstrated that after injury to the brain, rewiring and other dramatic changes occur in the spinal cord and the contralateral brain hemisphere. The degree of rewiring strongly correlates with recovery of function, and treatments that stimulate functional recovery also lead to rewiring of the spinal cord and the contralateral hemisphere. Insight gained from stroke models is now being extended to studies of traumatic brain injury, multiple sclerosis and diabetes-induced peripheral neuropathy.

Researchers have recently started to focus on the diabetic brain. Diabetes is a major risk factor for stroke, and diabetic patients have more severe stroke and poor outcomes. The laboratory is investigating the bases for these adverse effects of diabetes on stroke and is actively developing new therapies to treat the diabetic stroke brain.

The Henry Ford Neurology research laboratory has initiated a major effort into investigating the role of microRNAs (miRNA) and epigenetics in neurological disease and recovery. Results show that miRNAs regulate apoptosis (cell death) and stimulate brain plasticity and neurogenesis. This pioneering work may have a major impact on the treatment of many neurological diseases.

For more than 25 years Henry Ford neurologists have used MRI for understanding neurological disease.

Researchers have developed novel approaches to the MRI measurement of brain plasticity, including angiogenesis and restructuring of white matter in the injured brain, which appears to play a pivotal role in functional recovery. Techniques have been developed to measure new vessels, vessel density and white-matter structure in human and animal brains. This has the potential to create new diagnostic and prognostic tools for management of neurological disease, so that MRI will greatly augment efforts in restorative neurology.

Neurology researchers maintain a highly productive research effort on developing neuroprotective agents, with a focus on the treatment of the elderly brain. Agents have been identified that act synergistically with tPA to greatly extend its therapeutic window, enhance its efficacy and reduce adverse effects.

The department has a successful track record for obtaining NIH R01 grants, program project grants and funding from other agencies and foundations. The work of researchers is shared in numerous annual publications.

**Brain Trauma, Hemorrhages, Aneurysms and Epilepsy**

**Department of Neurosurgery** scientists and physician-scientists, in conjunction with Department of Neurology collaborators, work together in epilepsy, traumatic brain injury, and brain hemorrhage research. Also an outcomes research program focuses on spinal surgery, epilepsy, brain hemorrhage, aneurysms and hydrocephalus.

Traumatic brain injury (TBI) continues to be a cause of human morbidity. No therapeutic intervention yet exists to repair neuronal damage. Treatment consists of evacuating mass lesions and providing an optimal environment for the brain to recover. Investigators are examining the efficacy of transplanting marrow stromal cells (MSCs) in a model of head trauma. If this approach improves functional outcome, a new range of therapeutic interventions will be possible. To enhance the effect of MSCs, the cells are also being transplanted after being injected into collagen scaffolds. These provide a platform that bridges the gap in the damaged brain and enables MSCs to exercise their neurorestorative capabilities, combining bioengineering techniques with cell therapy to repair neural injury.

The department is also using pharmaceutical agents such as statins and velcade to promote neural recovery and improve functional outcome after TBI. In addition to their lipid-lowering effect, statins have demonstrated neuroprotective and neurorestorative capabilities that can be used to treat TBI. MSCs and statins have been combined to assess any synergistic effect. Department researchers are conducting a pilot clinical study to treat TBI with statins.

The Cerebrovascular Laboratory in the Department of Neurosurgery is studying the effects of statin treatment for intracerebral hemorrhage (ICH). Statins have been shown to promote angiogenesis and neurogenesis while reducing the volume of tissue damage and improving functional outcome. Researchers are conducting an ongoing clinical trial involving high-dose statin use and MRI after spontaneous ICH in humans. Other research includes marrow stromal cell administration after ICH to induce neurogenesis and novel protease inhibitors, which block calpain and cathepsins, to reduce neural damage.
Herrick-Davis Motion Analysis Lab researchers Jeffrey Haladik (center) and Cathryn Peltz, Ph.D. (right), utilize Henry Ford’s custom biplane x-ray system to analyze the three-dimensional foot and ankle motion of co-op student Scott Hoffman (left) in different footwear conditions in a study to minimize running-related injuries.
The mission of the Bone and Joint Center of the Department of Orthopaedic Surgery is to perform integrated, state-of-the-art research into the musculoskeletal system with the goal of understanding disease processes and developing new treatments. Five senior staff investigators pursue research programs in the structure, function, and pathology of musculoskeletal tissues, as well as clinicians who also conduct research. Osteoarthritis, osteoporosis and other bone and joint disease processes are studied in the laboratories, which are equipped to accommodate a full spectrum of research projects, from bioengineering to cell biology. Studies are funded by the NIH, Department of Defense and the pharmaceutical industry.

The Biochemistry laboratory is concerned with extracellular matrix turnover during health and disease, specifically its regulation and the underlying mechanisms of collagen degradation in bone and cartilage. Ongoing research is investigating the regulation of cartilage turnover and its implications for the treatment of osteoarthritis and degenerative disc disease.

The Cell Biology program focuses on changes in chondrocyte behavior associated with cartilage degeneration in osteoarthritis. Studies have focused on the role of microRNAs in maintaining cartilage integrity and the capacity of levels of non-coding RNAs (including microRNAs) in serum to predict cartilage pathology in early post-traumatic osteoarthritis.

The Anatomy program is primarily concerned with examining the effect of mechanical loading on skeletal tissue and structural morphology and physiology. Research examines the effects of changes in loading, nutrition, retroviral infection/treatment, chronic alcoholism, sunlight exposure and menopause on compact bone. Many of these investigations are aimed at understanding the early biological mechanisms of osteoporosis.

The Biomechanics laboratory is focused on improving the diagnosis of bone fracture risk associated with osteoporosis and improving techniques for preventing and treating fractures. High-resolution imaging, computer simulation, mechanical testing and microscopy techniques are used to estimate how mechanical stress is distributed in bone, quantify the chemical and structural makeup of tissue, and estimate bone strength and fracture risk. New techniques are developed using imaging modalities such as tomosynthesis to quantify bone properties that predict fracture risk.

The Herrick-Davis Motion Analysis Laboratory studies the dynamic function of human joints and mechanical factors associated with degenerative joint and soft-tissue diseases. Ongoing studies are aimed at understanding how the treatment of rotator cuff tears affects long-term shoulder function, the impact of fusion and artificial disc replacement on spine motion, and the effects of surgical reconstruction techniques on knee and elbow function.
More than 1.6 million Americans are diagnosed every year with cancer, and more than 570,000 people die each year from the disease. Cancer results from changes within normal cells that cause them to divide uncontrollably, invade adjacent or distant normal tissues, and evade current radiation and chemotherapies. Risk factors can increase the incidence of cancer, including family history of cancer, smoking, environmental pollutants, radiation, viruses and other biologic events. Studies of the molecular changes associated with cancer have shown that different cancers share many of the same genetic defects, but also have cancer-specific defects, necessitating the need for cancer-specific treatments. However, advanced technologies that permit the sequencing of many cancer genomes show that even patients with the same cancer diagnosis have tumors with different genetic defects. This realization has ushered in the era of personalized cancer medicine that is based on an individual’s specific cancer gene profile and an understanding of how their specific mutations promote their cancer.

Henry Ford cancer research programs exist within 11 separate divisions and departments, but synergies and collaborations are encouraged through the Cancer Research Advisory Group of the Josephine Ford Cancer Center. The five major cancer research programs are:

- Cancer Epidemiology, Prevention and Control
- Developmental Therapeutics
- Urologic Oncology
- Neuro-Oncology
- Cancer Imaging

In these programs, scientists and physicians are involved in studies examining early detection, diagnosis and prognosis, development of therapeutic agents and tumor biology, including causes and progression. The types of research undertaken in the Josephine Ford Cancer Center include epidemiological, behavioral, basic, clinical, and translational research, with associated clinical trials, including treatments based on personalized cancer gene profiles.

**CANCER EPIDEMIOLOGY, PREVENTION AND CONTROL PROGRAM**

**Cancer Screening and Prevention**

Department of Public Health Sciences investigators and physician scientist collaborators study the causes and risk factors related to cancer with the goal of developing interventions to prevent or delay the onset of new, recurrent and fatal cancers. Studies include the determination of genetic, environmental and lifestyle characteristics that increase the risk for new cancers or worsen prognosis of diagnosed cancers. Experts also study the
effectiveness of clinical and behavioral interventions to reduce cancer risk, such as screening tests, nutrition education and smoking cessation education programs. These studies are particularly well suited to the Josephine Ford Cancer Center because of the large and diverse population served by Henry Ford Health System. Current highlights include NCI-funded studies of:

- Risk factors for lung cancer among smokers.
- Genetic factors leading to a poor prostate cancer prognosis.
- Statin use as a preventive factor for lymphomas.
- An intervention program to increase fruit and vegetable intake (a known preventive factor for many cancers) in young adults.

**Head and Neck Cancer**

The multidisciplinary head and neck cancer research program in the Department of Otolaryngology focuses on genetic, epigenetic, transcriptomic and infection markers for early detection, diagnosis and prognosis of head and neck cancer. This includes NIH funding for molecular modeling of diagnosis and prognosis and serum monitoring studies. Henry Ford Health System Health Disparities Research Collaborative funding has supported disparities studies to determine whether race/ethnicity influences the molecular circuitry that programs the malignant behavior of the cancer cell in head and neck small cell carcinoma using ancestry-informative markers.

**Breast Cancer**

The breast cancer research program in the Department of Otolaryngology focuses on molecular markers and their interaction with other epidemiologic risk factors that can serve as risk indicators for subsequent development of breast cancer among women with benign breast disease. The program also explores identification of an informative set of specific genetic alterations that underlie the pathogenesis of disease progression in breast cancer. A Susan G. Komen grant award funds evaluation of methylation patterns to refine the classification of estrogen receptor-negative breast cancers, with particular focus on basal-like cancers, in patients of African and European ancestry.

**DEVELOPMENTAL THERAPEUTICS PROGRAM**

**Using Viruses to Fight Cancer**

Researchers in the Department of Radiation Oncology have developed a novel gene therapy-based approach to treat cancer. This approach utilizes an adenovirus (a virus that causes cold symptoms) to selectively and efficiently deliver therapeutic genes to tumors. Preclinical studies have demonstrated that the virus itself causes cell lysis and has potent anti-tumor activity. The efficacy of viral therapy can be enhanced significantly by including two additional “suicide” genes that render malignant cells sensitive to specific pharmacologic agents and sensitize them to radiation therapy.

This preclinical work has led to four Investigational New Drug applications and six FDA-approved, investigator-initiated clinical trials targeting prostate and pancreatic cancer. Henry Ford’s initial trial was the first FDA-approved gene therapy trial involving use of a replication competent, oncolytic adenovirus to deliver a therapeutic gene in humans. Patient enrollment criteria required evidence of locally recurrent prostate cancer after radiation failure. Five-year follow-up showed a significant slowing of disease progression in patients that received the gene therapy. Ten-year follow-up showed an improvement in disease-specific survival relative to well-matched historical controls.

A second trial was the first to combine oncolytic viral therapy with radiation therapy. This study enrolled patients with newly diagnosed prostate cancer. Post-treatment prostate biopsies showed a significant increase in cancer-free patients at two years. Based on these encouraging results, an improved second-generation adenovirus was developed and used in a phase 2/3 trial of prostate cancer and a phase 1 trial of pancreatic cancer. In October 2010, Henry Ford investigators were awarded a US patent on this virus.

Several third-generation adenoviruses have been developed that stimulate the anti-tumor immune response and can impact both local and metastatic disease. These new agents have demonstrated promising anti-tumor activity in preclinical models of prostate and pancreatic cancer and will become available to patients in a clinical trial in 2012. This work has been supported by the NIH.

**Novel Radiation Therapies**

Henry Ford’s Radiation Physics Division (Department of Radiation Oncology) carries out investigator-initiated and collaborative research with the primary objectives of investigating novel radiation therapy applications and translating them into clinical practice. The goals are to improve tumor targeting accuracy, reduce collateral radiation damage to healthy tissues and ultimately improve outcomes of cancer patients receiving radiation therapy. Areas of focus include image-guided radiotherapy and image-guided adaptive radiotherapy strategies, Monte Carlo IMRT optimization, novel means of biological modeling and deformable image registration approaches.

Research is conducted on 4D-treatment planning in terms of motion management, dose accumulation, dose optimization and adaptive re-planning strategies.
Faculty also actively engage in clinically-oriented research, such as exploring the utility of magnetic resonance imaging for treatment simulation, advanced treatment planning techniques including arc therapy and stereotactic body radiotherapy, and supporting databases for multiple treatment sites that assist in outcomes-related research. The division’s research efforts are supported by a variety of funding sources, including the National Institutes of Health and industry sponsors.

Protecting Healthy Tissue

The goal of the normal tissue radiation protection program in the Department of Radiation Oncology is to develop an effective pharmacological strategy to mitigate and treat radiation-induced injury in humans. Research efforts are focused on anti-apoptotic agents to be used immediately to one day after radiation exposure, anti-inflammatory agents which reduce injury in the weeks and months after radiation exposure, and stem cell therapy which works to completely repair injured tissue. Pre-clinical models of radiation injury have been developed for both acute responding tissues (bone marrow and skin) and late responding tissues (brain). Endpoints of study include tissue function. Several agents have been shown to be effective, and some are already FDA approved and have been shown to reduce normal tissue injury following insults other than radiation. Investigators are exploring the mechanisms of action of the compounds and optimized timing for administration. Research efforts address the need to reduce late normal tissue complications in cancer patients receiving radiation therapy as treatments become more effective and patients are living longer. Research also fulfills the US government initiative to have available radiation injury countermeasures in case of radiological attack or nuclear disaster. This research is funded by the NIH and industry sponsors.

Drug Discovery and Development

Research in the Hematology/Oncology Division of the Department of Internal Medicine focuses on the discovery and development of new anti-cancer agents. This is a long, costly, high-risk process. It involves the orchestration of many disciplines, including biologists, biochemists, chemists, pharmacologists and clinical scientists to first define a “hit” and then develop the discovery by laboratory testing, study the drugs pharmacology, toxicity and efficacy, and finally perform clinical trials. Researchers...
have been testing synthetic and naturally occurring compounds derived from plants, sponges, microorganisms and cyanophytes. They are developing a unique and novel cellular assay that discovers compounds which preferentially target solid tumor cells more effectively than normal cells, then determining the concentration required to kill tumor cells both in culture and in animal models.

Because the National Cancer Institute requires establishing a certain degree of anti-tumor activity in animal studies before further research and eventual clinical trials can be supported, the drug is formulated for injection into animals and tested to determine whether drug levels in the tumor are high enough to achieve a therapeutic response. Some of the compounds developed in the discovery program will ultimately be tested in clinical trials at Henry Ford Health System. This research is funded by the NIH and the Josephine Ford Cancer Center.

**Urologic Oncology Program**

Prostate cancer is a major focus of research at Henry Ford’s Department of Urology and Vattikuti Urology Institute. The androgen receptor (AR) plays an important role at all stages of prostate cancer development and progression. Researchers discovered that a calcium-binding protein, calmodulin (CaM), binds to AR and regulates AR function and AR protein stability. Therapeutic strategies targeting AR-CaM interaction are being designed to prevent the development and/or progression of prostate cancer in men at risk for the disease. Investigators also discovered that AR interacts with telomeres whose structural stability is essential for the survival of prostate cancer cells. These studies are focused on identifying AR-interacting proteins in telomeres that can be targeted for the treatment of prostate cancer.

A major clinical challenge is to identify patients who require aggressive treatment because their prostate cancer is likely to metastasize. By analyzing microRNA expression profiles, researchers can distinguish between prostate cancers that metastasize versus those that do not. These biomarkers of outcome will identify men who need to be followed more closely and offered more aggressive treatment.

A high-fat diet is a risk factor in the development and progression of prostate cancer. Researchers discovered that arachidonic acid, a common fatty acid in Western-style diets and its metabolites generated by 5-lipoxygenase, play a critical role in the survival of prostate cancer cells. Investigators are testing new compounds that inhibit 5-lipoxygenase and show promise for the treatment of advanced prostate cancer. Funding was provided by the NIH and Department of Defense.

**Department of Surgery** research focuses on the use of purified herbal products to prevent and treat prostate cancer and pancreatic cancer in preclinical models of these diseases. Because these cancers develop slowly over time, early intervention with non-toxic herbal compounds to prevent or slow the progression of these cancers is a promising approach to conquer these diseases. Some of the natural agents or their synthetic derivatives used as chemopreventives include curcumin from turmeric, resveratrol from grapes and synthetic triterpenoids derived from the naturally occurring oleanolic acid. Selection of these agents is based on their use as herbal remedies in traditional medicine and recent scientific evaluation of the compounds showing strong anti-inflammatory and antioxidant attributes. Chemoprevention studies employ transgenic mouse models of prostate cancer and pancreatic ductal adenocarcinoma. Therapeutic models include cell culture and orthotopic xenograft models of these malignancies. For the mechanistic evaluation of the anti-cancer activity, these studies focus on specific signaling pathways, which may provide critical information for clinical trials for prevention of prostate and pancreatic cancers in humans. Present and past investigational studies have been made possible through NIH funding.

**Neuro-Oncology Program**

Research in the Hermelin Brain Tumor Center in the Department of Neurosurgery focuses on several novel areas of investigation to help control the growth, survival and invasion of glioblastomas with a focus on personalized medicine. In 2011, the department received research support from the National Institutes of Health, pharmaceutical companies, other industries and philanthropy.

Personalized medicine is based on obtaining patient-specific genetic analyses of patient brain tumors. Identification of the patient mutations is important not only for diagnosis, but for new drug development that can be used in patient treatment. Preclinical evaluations of molecular-based personalized approaches are currently under way.

Anti-invasion tumor therapy focuses on finding new molecular targets or drugs that can stop tumors from invading healthy brain tissue. Investigators have demonstrated that the protein SPARC promotes invasion partly through upregulation of another protein called HSP27. In addition, novel studies implicate heparanase as an invasion-promoting molecule. Investigators are also studying the role of the novel protein RTVP in
the regulation of cell migration and mesenchymal transformation of glioma stem cells. The potential of SPARC, HSP27, RTVP or heparanase as therapeutic targets to inhibit brain tumor invasion is currently being studied.

Glioma cells have altered growth properties and are resistant to “death” signals received by the cells following anti-cancer treatments. Investigators are studying how the signaling molecule protein kinase C (PKC) is involved in the response of glioma cells to many different “death” stimuli. By understanding this signaling molecule and its effects in cells, it may be possible to develop novel therapeutic approaches that will promote glioma cell death instead of tumor growth, improving response to treatments.

The Department of Neurology also has a vibrant and productive program on the treatment of glioma. The laboratory investigates novel therapeutic approaches for the treatment of glioma and has a successful program on the basic communication of miRNA between tumor cells and between tumor and parenchymal cells.

Cancer Imaging Program

The Cellular and Molecular Imaging Laboratory in the Department of Radiology uses MRI, SPECT and optical imaging (bioluminescence and fluorescence) modalities, as well as confocal and fluorescent microscopy, to identify different pathophysiologic parameters before and after interventions in malignant tumors such as brain, breast and prostate cancers. The main theme of research is theragnostic – a combination of diagnosis and therapy – using stem cells and nanotechnology. Stem cells collected from human cord blood are genetically modified to carry reporter as well as therapeutic genes to be used as imaging and therapeutic probes for detection and intervention of abnormal blood vessels in malignant tumors. Researchers also create nanoparticle-based theragnostic probes to carry different chemotherapeutic agents as well as therapeutic DNA or RNA to the sites of tumors.

Current research projects are:

- Differentiation of glioma from radiation necrosis using endothelial progenitor cells and cytotoxic T-cells.
- Delivery of chemotherapeutic agents using pH-sensitive nanoparticles (PARACEST agent).
- Delivery of therapeutic genes to the tumors using stem cells and nanoparticles.
- Determination of involvement of stem cells in resistance to anti-angiogenic treatment in glioma and breast cancer.
- Treatment of stroke using cord blood-derived endothelial progenitor cells.

In addition, investigators in the Department of Neurology are completing the third year of a five-year NIH grant to use MRI to assess whether non-invasive and quantitative MRI-measured vascular parameters can be used to predict brain tumor response to trial therapies. Trial therapies under study include promising anti-angiogenic agents and vascular disrupting agents applied singly or in combination with or without radiation therapy. Stable and reproducible MRI methodologies for quantifying the physiology of tumors in animal models have been developed and then applied to human brain tumors. The studies represent a first step in a paradigm shift in cancer treatment delivery from a one-solution-fits-all approach to an individualized plan of image guided treatment and response monitoring.
The Henry Ford Immunology Program (HFIP) is a newly established research program associated with the Departments of Dermatology and Internal Medicine. Its focus is primarily on autoimmune, cancer, and inflammatory diseases. There are more than 100 types of autoimmune disease affecting connective tissue (for example, lupus erythematosus), endocrine systems (for example, autoimmune type 1 diabetes), and skin (for example, psoriasis and vitiligo). Diabetes and vitiligo are currently HFIP’s primary focus. The HFIP enables basic and clinical investigators to work together to advance the battle against these diseases through translational research, ultimately resulting in improved clinical care. Currently, HFIP has three investigators with three external research grants awarded by the NIH and foundations.

Using a variety of genetically modified mice as disease models, HFIP researchers have identified some candidate genes, including the recently discovered small non-protein coding RNAs known as microRNAs (miRNAs), which can regulate immune functions related to autoimmune and cancer development. HFIP researchers first found that miRNAs can regulate the development and function of immune regulatory T-cells, or natural killer T-cells. These T-cells are key immune cells that control both autoimmune disease and cancer development. Understanding the biological functions of miRNAs in immune cell development and function will shed new light on the pathogenesis of immune-related diseases and lead to novel strategies for disease treatment. In addition, using high throughput miRNA expression profiles, researchers also discovered serum miRNAs as potential new biomarkers for disease prevention and prediction, including type 1 diabetes and melanoma.

Li Zhou, M.D. (foreground), Qing-Sheng Mi, M.D., Ph.D. (middle), and Yu-Ling Shi, M.D., Ph.D. (back) prepare to acquire cell sorting data for their projects in the Henry Ford Immunology Research laboratory of the Departments of Dermatology and Internal Medicine.
A variety of programs are housed within the Center for Health Policy and Health Services Research (CHP&HSR). These include funded projects in decision sciences, medication adherence, outcomes research, development of databases for mental health services, and pharmacogenomics to aid in the understanding of health disparities.

CHP&HSR investigators are using direct observation and audio-recordings from more than 500 primary care patient-physician interactions to study how colorectal cancer screening and other clinical preventive services are discussed during annual check-ups. Investigators also are collaborating in practice-based, randomized clinical trials evaluating interventions designed to improve colorectal cancer screening rates in primary care. Capitalizing on the unique and comprehensive data collected thus far, Henry Ford recently received funding from the National Institute of Mental Health (NIMH) to study how patients’ mental health concerns are being addressed by primary care physicians.

Henry Ford has two NIH-funded projects evaluating the potential of electronic prescription systems to tell clinicians whether patients are taking their medications. It is believed these two projects, one involving asthma patients and one involving patients with diabetes, will show whether such information improves clinical outcomes among patients whose disease remains uncontrolled. A longitudinal study of medication follow-up among patients with multiple sclerosis has shown that patients who stick to their medication regimen are more likely to enjoy improved quality of life and employment outcome.

Henry Ford also has several observational studies that involve the follow-up of defined groups of patients over time. One prospective, multi-site study evaluates treatments and outcomes among 10,000 newly diagnosed lung and colorectal cancer patients. Another cohort study initially funded by
the Merck pharmaceutical company examined factors associated with outcomes among heart failure patients, focusing on worsening renal function among hospitalized patients with acute heart failure, the association with specific treatments, and clinical outcomes such as repeat hospitalization or death.

Henry Ford is one of the participating members of the Mental Health Research Network, a multi-site project funded by NIMH that involves most members of the HMO Research Network. Investigators in both CHP&HSR and in Behavioral Health Services at Henry Ford are involved in studies of patterns of depression care, use of selective serotonin reuptake inhibitors (SSRIs), and suicide risk among patients with depression. The project involves development of a database of patients with mental health conditions that can serve as a framework for future studies.

Asthma-related hospitalizations, emergency room visits and deaths are three to five times higher among African-American patients than white patients. Existing evidence suggests that African Americans may not benefit from regular inhaled corticosteroid (ICS) use as much as white patients. Investigators are assembling a diverse patient population from metropolitan Detroit and using genotyping and analytical techniques to identify loci associated with response to ICS treatment.

African Americans also have a higher prevalence of and mortality due to heart failure than whites. Beta-blockers are the foundation of modern care for heart failure, but Henry Ford researchers have shown that beta blocker treatment is much less protective among African Americans than whites. The team is now leading an NIH-funded study that will enroll 1,000 heart failure patients in a registry to quantify medication exposure and clinical outcomes to improved targeting of therapy to those with the highest likelihood of favorable response.

Department of Public Health Sciences

The Department of Public Health Sciences conducts and promotes population and clinical research studies to advance biomedical knowledge that will result in disease prevention, improved prognoses and overall health status improvements. Research in the department focuses on health, disease risks, effectiveness of medical care, and health care services extending over the entire human lifespan. It encompasses wide range of domains, including genetic, biological, social, lifestyle, and environmental exposures.

Henry Ford Health System is ideally situated in metropolitan Detroit, an urban/suburban setting that boasts socioeconomic, environmental and racial/ethnic diversity and offers opportunities to explore all of these aspects within a comprehensive system of health care and medical services. These aspects guide research and stimulate researchers to include risk factors and diseases that are common among the populations served. Public Health Sciences researchers have become increasingly dedicated to uncovering factors and solutions that may reduce racial/ethnic disparities in disease risk, health and health care. Many projects include multidisciplinary teams made up of Henry Ford Health System researchers and collaborating institutions and universities in Michigan and across the country.

Research activities center on collaboration between teams of research professionals, including epidemiologists, behavioral scientists, health service researchers, biostatisticians and clinicians. Highlighted programs include the Cancer Epidemiology, Prevention & Control Research Program of the Josephine Ford Cancer Center; the HFHS Health Disparities Research Collaborative; the Center for Allergy, Asthma & Disparities Research; Statistical Coordinating Centers; Gene-Environment Risk Factor studies; Women's Health Research; the National Children's Study; the HMO Research Network; Clinical Epidemiology; and Pharmacoepidemiology.

The Henry Ford Center for Allergy, Asthma & Immunology Research is co-led by an epidemiologist, Christine Cole Johnson, Ph.D., and an allergist, Edward Zoratti, M.D. The Center brings together a group of scientists and physician investigators focused on the primary prevention and management of allergic disorders including food allergy, atopic dermatitis, allergic rhinitis and asthma. Starting in the late 1980s, this group has successfully competed for numerous federal grants and contracts as well as industrial funding. Work has included the establishment and follow-up of two large birth cohorts determining patterns of immunologic development and risk factors for these diseases, as well as studies based on children with asthma in the urban setting. Investigators include epidemiologists, physician scientists, biostatisticians and bench scientists.

Because expertise lies in research methodology and disease-specific research, Public Health Sciences also provides core research services including study design, biostatistical analyses, forms design and data collection (interviewing, medical record abstracting, clinical data and biospecimen collection, HFHS database analyses, study and data management and selected biomarker measures, in particular those related to immunology, and quality initiatives such as HEDIS and Pay For Performance).
Henry Ford scientists and physicians also participate in and lead many studies involving patients and patient data that help us understand disease etiology and how to best treat disease. Altogether, there are more than 1,700 active clinical studies at Henry Ford involving more than 170 investigators and support staff from every clinical department. Clinical research from six of those areas: Neurology, Emergency Medicine, the Josephine Ford Cancer Center, Infectious Diseases, Gastroenterology and Hepatology, and Sleep Research is described on the following pages.

Neurology

The Department of Neurology actively conducts and supports clinical trials for a wide spectrum of neurological disorders ranging from stroke, traumatic brain injury, multiple sclerosis and epilepsy, to amyotrophic lateral sclerosis, dementias, neuromuscular diseases, movement disorders and speech and language pathology. The clinical trial programs are either multicenter, late-phase trials funded by various sources, such as the NIH, foundations and industry sponsors, or are initiated by department investigators and funded by the NIH, industry sponsors and philanthropic donations. Currently there are 109 active clinical investigational studies, with 27 clinicians working along with a team of 14 research support personnel.

Dora Vager of Infectious Disease Research works with C. glabrata and S. aureus to evaluate the impact of polymicrobial biofilms on antibiotic resistance.
Emergency Medicine

Henry Ford Health System serves as a hub for the Neurological Emergency Treatment Trials (NETT) Network. Funded by the NIH, Henry Ford is the regional coordinating center for community and academic medical centers and conducts phase 3 clinical trials of treatments for stroke, traumatic brain injury, seizure, and other neurological emergencies. The NETT network is currently conducting studies on high-dose albumin for neuroprotection in acute ischemic stroke, progesterone for the treatment of moderate to severe traumatic brain injury, and aspirin vs. aspirin alone for minor stroke and transient ischemic attack (TIA).

NETT researchers work closely with the Ford Acute Stroke Team to participate in the Interventional Management of Stroke trial 3 (IMS III), which compares standard intravenous (IV) tPA to a combined approach of intravenous and intra-arterial treatment (IV+IA). The Henry Ford Health System NETT research pipeline also provides an opportunity for young faculty to develop into principal investigators. In 2011, this work was supported by NIH funding.

Josephine Ford Cancer Center

The Josephine Ford Cancer Center Oncology research core consists of 41 physician investigators and 31 research nurses, research assistants and study coordinators who provide a multi-disciplinary approach to cancer care across all the specialty services throughout the System. This is accomplished by providing a centralized clinical research support system through the Clinical Trials Office to all primary departments through which cancer patients are evaluated and treated for their malignancies. These include the Division of Hematology/Oncology and the Departments of Radiation Oncology, General Surgery, Neuro-Oncology, Urology, Gynecologic Oncology and Otolaryngology.

Because of this coordinated effort, the Josephine Ford Cancer Center Oncology Program has established both an institutional and national reputation for providing exceptional patient care and quality assurance in conducting cancer clinical trials. Through the mechanisms of the National Cancer Institute-supported cooperative group program and industry-sponsored, consortium and Henry Ford investigator-initiated clinical trials, eligible Henry Ford patients are offered state-of-the-art clinical trials as additional treatment options with various new anti-cancer agents or therapies that are not available under the traditional standard of care. These clinical research-related therapies usually result from cutting-edge scientific advances, often from investigations of novel anti-cancer mechanisms or from studies of cancer cell-specific targets. These newer anti-cancer therapies also provide patients with personalized therapeutic options.

Up to 100 Phase I-IV trials, as well as therapeutic intervention, prevention, observational and compassionate-use oncology clinical trials, are available to Henry Ford Health System cancer patients at any given time. As an active member of an established network of cancer research, the System is privileged to offer patients new anti-cancer drugs and therapies that are available at a very small number of sites nationwide or worldwide.

Infectious Diseases (Internal Medicine)

The division’s research interests focus on infectious disease diagnostics, transplant infectious diseases, prevention of hospital-associated infections, fungal infections, infection due to antibiotic-resistant bacteria, and HIV/AIDS. Using the strength of its clinical volume and diverse spectrum of infectious diseases, the division is partnering with colleagues both inside and outside the institution to develop and test new assays for infectious diseases and to participate in clinical trials for new anti-infective treatment. Research

Drs. Markowitz (foreground) and Baxa of Infectious Disease are examining an image showing mitochondrial damage in HIV-infected U937 cells.
in the division is funded by the Centers for Disease Control and Prevention, NIH and pharmaceutical company partners.

The research interests of the division include a combination of translational basic science, laboratory outcomes and clinical studies. Staff work to bridge the application of bench research to the patient bedside. Specific investigations include the study of the epidemiology and treatment of antibiotic-resistant Staphylococcus aureus, outcomes and new therapies for HIV/AIDS, and epidemiology and development of rapid and specific testing and new treatments for fungal infections in immune-compromised patients.

The laboratory also provides specimen processing facilities for the purpose of plasma, serum and cell collection required of the various study protocols in which the infectious disease clinic participates, including the AIDS Clinical Trials Group and the international HIV network.

Gastroenterology and Hepatology (Internal Medicine)

The Hepatology research section consists of five hepatologists, two hepatology physician assistants, and a clinical research team that includes 14 registered nurse clinical research coordinators, clinical research assistants and project coordinators. The major focus of clinical hepatology research involves the treatment of viral hepatitis. The recent development of potent hepatitis C protease and polymerase inhibitors has stimulated a global effort to eradicate this virus. Several novel agents, used alone or in combination with other antivirals, have contributed to a rapidly advancing and exciting area of clinical research. Other divisional research protocols involve the management of primary liver cancer, fatty liver disease, hepatic encephalopathy, and hepatorenal syndrome. The division is also investigating a novel Israeli-made breath test designed to measure liver function.

Sleep Research (Internal Medicine)

Researchers at the Sleep Research Laboratory pursue insomnia, psychopharmacology, shift work disorder and sleep-related respiratory and movement disorder research. As a disorder of arousal, insomnia research investigations include the pathophysiology and morbidity of insomnia as well as behavioral and pharmacological treatments. Research is also focused on insomnia and the HPA axis as well as the identification of gene candidates for insomnia predisposition. Psychopharmacology research explores the relation of sleep, sleep disorders and variations in sleep as they relate to the use of a variety of drugs. Research ranges from identifying and evaluating safety and efficacy to understanding sleep mechanism-mediating substance abuse.

Investigators are conducting research aiming to elucidate the pathophysiology of shift work disorder as a distinct clinical entity seen in shift workers. Research focuses on identifying the morbidity associated with shift work disorder, specifically the neural substrates of this morbidity. Behavioral and pharmacological treatments for shift work disorder are being developed and evaluated. Clinical research on a variety of sleep-related respiratory and movement disorders is also ongoing.

A Sleep Center researcher identifies specific brain activity characteristic of hyperarousal in a patient with insomnia.
Henry Ford Health System is a robust research institution that feeds the future of healthcare with breakthroughs in medicine and boasts some of the best scientists in the country. In 2011, more than $2.5 million in funding came in the form of grants and charitable gifts from foundations, associations, and individuals in support of medical research.

Most private donors are compelled to support medical research because a specific disease has touched their loved ones or they feel passionate about having a long-term impact on health and the millions of people who will benefit. Research is the beacon of such dollars being invested from a number of generous funders. Of those funders, a few of the Henry Ford Health System private donors were:

- **Jae Ho Kim, M.D., Ph.D.**, contributed an additional $30,000 to his Endowment Fund for Research
- **Rita Lorraine Koncieszczek Trust**, for lung cancer and heart failure research: $1.3 million
- **Roy D. Angers**, for RNA Markers in prostate cancer research and enhanced gene therapy research: $117,000
- **Ruth McVay**, for ovarian cancer science research: $28,000

The Employees of HFHS continued to give generously to research through the annual community giving campaign.

Many corporate donors also play a part of charitable giving to medical research:
- **Intuitive Surgical** donated $90,000 for research
- These organizations awarded funds in support of grants that are part of meritorious research:
  - **CDC Foundation**: $1.1 million
  - **American Heart Association**: $442,000
  - **Susan G. Komen for the Cure**, first installment of a three year, $600,000 pledge for breast cancer research

A number of others also gave in 2011. So many charitably support the work of Henry Ford Health System research that it is impossible to list them all, however, theirs is some of the most meaningful giving. Contributions to medical research will save millions of lives into the future. Ultimately, research donors are helping to shape the future of medicine at Henry Ford and beyond.
Research fellow Tao Yan, M.D., left, describes his poster, “Cerebral vascular changes in type I diabetic rats” at the 9th Annual Research Symposium, held in May 2012 at Henry Ford Hospital. Listening are, from left: Margot LaPointe, Ph.D., Vice President for Research, Henry Ford Health System; Henry Lim, M.D., chairman, Department of Dermatology, Henry Ford Hospital, and senior vice president for Academic Affairs, Henry Ford Health System; John Popovich, M.D., president and CEO, Henry Ford Hospital; and Mark Kelley, M.D., executive vice president and CMO, Henry Ford Health System, and CEO, Henry Ford Medical Group.
Mission
To improve people’s lives through excellence in the science and art of health care and healing

Vision
Transforming lives and communities through health and wellness - one person at a time

Contact Us
For more information on any of these subjects, please contact Henry Ford’s Vice President for Research, Margot C. LaPointe, Ph.D. (mlapoin1@hfhs.org). Annual research reports, including external funding and peer-reviewed publications, can be found at www.henryford.com. Click on “Research” in the Henry Ford Medical Group Centers of Excellence section of the page.