

# MINNEAPOLIS MEDICAL RESEARCH FOUNDATION

*medical research for healthy lives*



Addiction Medicine • Amyotrophic Lateral Sclerosis (ALS) • Alternative Medicine • Clinical Outcomes • Cancer • Cardiac Biomarkers • Chronic Disease • Cognitive Issues in Aging/Geriatrics • Diabetes & Obesity • Emergency Medicine • Gastrointestinal & Liver Disease • Heart Disease • Heart Failure • HIV/AIDS • Huntington's Disease • Kidney Disease • Orthopaedics & Biomechanics • Organ Transplantation • Pediatric Medicine • Sleep Disorders • Tobacco Treatment Research • Traumatic Brain Injury • Trauma & Burn

## 2008 ANNUAL REPORT

# The Minneapolis Medical Research Foundation

At the Minneapolis Medical Research Foundation (MMRF), we have been finding answers to the health problems of our patients since 1952. We support and oversee the medical research conducted at Hennepin County Medical Center. In an academic environment that emphasizes patient care, research and teaching, MMRF helps offer patients better care now and hope for improved healthcare in the future.

MMRF is the third largest medical research non-profit in Minnesota and ranks in the top seven percent nationally of all institutions receiving research grants from the National Institutes of Health. While public monies support a majority of our research, our work would not be possible without the support of corporate and individual donors.



MMRF has active research programs in:

*Addiction Medicine*  
*Amyotrophic Lateral Sclerosis (ALS)*  
*Alternative Medicine*  
*Clinical Outcomes*  
*Cancer*  
*Cardiac Biomarkers*  
*Chronic Disease*  
*Cognitive Issues in Aging/Geriatrics*  
*Diabetes & Obesity*  
*Emergency Medicine*  
*Gastrointestinal & Liver Disease*  
*Heart Disease*  
*Heart Failure*  
*HIV/AIDS*  
*Huntington's Disease*  
*Kidney Disease*  
*Orthopaedics & Biomechanics*  
*Organ Transplantation*  
*Pediatric Medicine*  
*Sleep Disorders*  
*Tobacco Treatment Research*  
*Traumatic Brain Injury*  
*Trauma & Burn*

## A Message from Our President

MMRF and its investigators were presented with some rather unique opportunities in the past year. The American Recovery and Reinvestment Act (ARRA) passed by congress contains over \$9 billion in funding for the National Institutes of Health (the good news) all of which has to be allocated and spent within 2 years (the challenge).

This radically compressed time frame required NIH to essentially invent a compacted application process, and investigators to submit proposals in a wildly accelerated fashion. At the institutional level, MMRF's grants management staff had to handle an unprecedented number of applications in a short time with very tight deadlines. All rose to the task and 33 proposals were submitted, which are currently being reviewed.



While the wisdom of radically increasing federal research funding but for only a short period of time is questionable as a long term strategy, there is clearly no shortage of ideas for using any additional money that becomes available, and of course many jobs in jeopardy because of the recession that might benefit from interim support while their funding basis is stabilized.

A second opportunity for MMRF is the establishment of a joint fundraising effort with the Hennepin Health System (HHS) in the form of the newly created Hennepin Health Foundation. MMRF has in the past sought and attracted philanthropic support for its programs through its Development Department, and HHS (formerly Hennepin County Medical Center) has not had a formal philanthropic effort other than the work of the Service League. It is hoped by all that a joint effort in support of our combined patient care, education and research missions will benefit all by allowing us to combine our resources and attract new philanthropic support. This is a long-term effort that will take some time to fully establish, but we are delighted that we can take advantage of the combined strengths of HHS and MMRF to present a strong case for attracting community support.

MMRF's great strength continues to be the ability of its researchers to produce excellent science and to consistently compete on a national level for support. Researchers brought in nine new federal awards and one competing renewal in 2008. These awards helped grow our base of federal funding to a total of \$13.3 million dollars, an 8% increase over 2007. Federal funding now accounts for 57% of MMRF's revenue. Research grants from industry, our other major source of sponsored support, dropped slightly to \$6.7 million, while MMRF endowment distributions totaled \$597,114, bringing total funds distributed from endowments to over \$6.9 million.

A handwritten signature in black ink, appearing to read "Pentel". The signature is fluid and cursive, with a large initial "P" and a long, sweeping underline.

Paul Pentel, MD  
President, MMRF

# Did You Know?

As a part of its education mission, MMRF sponsors public outreach programs - the *Downtown Health Series & Research in Translation* - where community members are empowered to take charge of their health by learning about the latest advances in healthcare practices and medical research.

Orthopaedic researchers at MMRF are developing new methods to improve the way bone bonds to implanted devices and researching ways to reduce infection and enhance healing after orthopaedic surgeries.

MMRF supports the work of more than 200 investigators, including MDs, MD/PhDs, and PhDs.

In 2008, MMRF administered approximately \$25 million in research funds.

Addiction medicine researchers are investigating how a person's genetic make-up impacts their ability to overcome drug addiction.

Heart failure researchers at MMRF have begun an expansive project to take recent breakthroughs in our understanding of heart failure and develop them into new therapies physicians can use to treat their heart failure patients.

In 2008, 57 percent of MMRF's funding came from public sources, including the National Institutes of Health, Department of Defense, and other federal government entities.

MMRF researchers publish a wealth of medical knowledge based on their MMRF sponsored research projects. In 2008, our researchers published more than 200 scientific articles and book chapters.

MMRF researchers in the Chronic Disease Research Group are the national leaders in tracking and predicting trends in chronic conditions such as kidney disease, cardiovascular disease, diabetes, anemia, and dementia.

MMRF is the third largest medical research not-for-profit institution in Minnesota.

MMRF researchers have begun work on a vaccine for opiate-based drugs that has the potential to improve treatment options and outcomes for people recovering from drug addiction.

# Revealing the Impact of Heart Damage

Each year, 1.2 million Americans will suffer a heart attack. Nearly 40 percent of these people will not survive their heart attack, resulting in 450 thousand deaths annually. During a heart attack, time is crucial. The sooner it is determined that a person is having a heart attack, the more likely it is that medical professionals can save the heart muscle from severe damage and save the patient's life.

When a person suffers a heart attack, the damaged heart muscle releases proteins into the bloodstream that are called cardiac biomarkers. Testing for cardiac biomarkers has become the key method of determining whether a person has suffered a heart attack. They tell doctors not only whether a person has had a heart attack, but they also indicate how much the heart has been damaged.

Fred Apple, PhD, has been researching cardiac biomarkers for more than 20 years. From very early in his career, Dr. Apple had a keen interest in studying protein expression in developing and damaged heart and skeletal muscle. His first studies on cardiac biomarkers looked at marathon runners as a model for cell injury. This early work evolved into a programmatic approach to

study the biomarker proteins that provide early signals for detecting heart tissue disease and death.

Today, the breadth of Dr. Apple's research has expanded to cover the many processes involved in myocardial disease. His work is improving our understanding of the functional changes that occur in the body of someone suffering from inflammation, ischemia, plaque rupture and instability, myocardial dysfunction, and myocardial cell death.

In 2008 MMRF invested in new lab space to help Dr. Apple continue his research on cardiac biomarkers. The redesigned lab consists of 2,500 square feet of streamlined work space that will improve the group's ability to conduct the day to day activities that go into their research projects.

The new lab space is an important feature to help Dr. Apple and his team continue their work. New insights from their research have the potential to allow earlier diagnosis and treatment of coronary artery disease - saving lives and improving the quality of life for those at risk for heart attack.



*Dr. Apple and his cardiac biomarkers research team. Pictured, from back left: Karen Schulz, BS, CD; Kalen Olson, PhD; Tami Ogorek, BA; Ranka Ler, CLS (C); & Fred Apple, PhD. Front left: MaryAnn M. Murakami, BA; Jason Kaczmarek, MT, ASCP; Betty Kilburn, MA; & Je'Nise Bryant, BA.*

# New Insights on Dementia

Dementia is a progressive deterioration of the brain that slowly steals a person's mind. It is described in degrees of cognitive (mental) impairment, with minor memory problems at the low end of the spectrum, to severe cognitive symptoms at the high end leading to loss of ability to perform daily functions. Leading causes of dementia include Alzheimer's disease, vascular dementia (or dementia from blood vessel damage and strokes), mixed Alzheimer's and vascular, or Parkinson's disease.

Anne Murray, MD, MSc, has been working with dementia patients and researching the condition for more than 20 years. She works in the Chronic Disease Research Group, the United States Renal Data System, and the Berman Center divisions of MMRF and studies risk factors and outcomes for dementia.

Dr. Murray's work has shown that hemodialysis in chronic kidney disease patients often causes severe temporary cognitive impairment during dialysis, with apparent recovery after each dialysis session. Over time, the continued hemodialysis may contribute to dementia. A study she recently completed showed that about 70 percent of hemodialysis patients over the age of 55 have moderate to severe cognitive impairment and that hemodialysis patients have about three times the

risk of developing dementia compared to the general population.

She suspects that hemodialysis causes cognitive impairment because it causes a rapid drop of blood volume going to the brain and brain swelling as blood and waste products are removed from their body during dialysis. This blood flow hypothesis is supported by the fact that blood pressure in the brain drops during dialysis, the incidence of stroke is higher during dialysis, and that stroke is four times more common in dialysis patients than in the general population.

With support from MMRF, Dr. Murray has begun a research project using a device called a trans-cranial Doppler to measure cerebral blood flow velocity in the main artery of the brain during dialysis while also measuring cognitive function. She hopes this will give her a clearer picture of the impact of blood flow changes on the brain during dialysis. Dr. Murray is examining how conventional, in-clinic hemodialysis affects cognitive function when compared to home hemodialysis. She hypothesizes that the negative effects of hemodialysis will be much less pronounced in home hemodialysis because it is a longer, slower process that may be gentler on the brain than conventional hemodialysis.

In another of her active research projects, Dr. Murray is conducting a pilot study to measure how common cognitive impairment is in earlier chronic kidney disease - those patients who have lost half or more of their kidney function, but do not need dialysis yet. Many of these patients also have diabetes, as it is now the leading cause of chronic kidney disease. Study participants are also receiving brain MRI's to see how commonly 'silent' and symptomatic stroke and microvascular changes occur.

Dr. Murray is currently seeking additional funding to pursue these important studies. Her long term goal is to continue to improve our understanding of the complex ways that kidney disease and diabetes increase the risk of cognitive impairment and dementia. Armed with this information, she and other researchers can investigate ways to prevent its development.



Anne Murray, MD, MSc, researches dementia and the diseases that cause dementia.



# Shedding Light on Drug Addiction

New medical knowledge is built upon earlier insights. Deliberate and careful experimentation in one area can lead to discoveries that can turn the course of a project in a whole new direction.

Paul Pentel, MD, knows this process first hand. In the 1980s he established a research lab at MMRF to study treatments for drug overdose. Ten years later he adapted some of the methods developed in his lab to explore new approaches to treating nicotine addiction. His research led him to develop a nicotine vaccine. Based on this work, Dr. Pentel and his collaborators Drs. Dan Keyler, Mark LeSage and Andy Harris have begun work on a vaccine for opiate addiction.

When we hear of vaccines, most of us probably think of them as treatments to help protect us from infectious diseases. However, vaccines can be used for much more than just infectious disease prevention. The key to a vaccine's power is its ability to train our body's immune system to react to some foreign substance, whether it is an infectious disease or a chemical.

Dr. Pentel's understanding of the potential power of vaccines led him to spend years developing a vaccine for nicotine. The vaccine he developed works by getting the immune system to recognize nicotine as a foreign entity to which it must respond. When a person smokes a cigarette and nicotine floods into the bloodstream, the immune system does not react to nicotine because of its very small size. However, it is possible to attach nicotine to a larger protein molecule to make it look foreign to the immune system and elicit the production

of antibodies that can bind the nicotine very tightly. The antibody-bound nicotine molecules are then too large to pass from the bloodstream to the brain, effectively reducing the pleasurable effect one gets from using tobacco. This vaccine has moved from the research and development stage and is now in human clinical trials.

The successful efforts of Dr. Pentel's lab and other groups in developing nicotine vaccines led him to wonder whether the same process might be effective for treating other types of addiction. Recently, the National Institutes of Health awarded him a research grant to explore the use of a vaccine for opiate addiction. For the past year and a half, he and fellow researchers have been conducting basic research on such a vaccine.

They hope to create what is called a multivalent vaccine, one that could prime the body's immune system against several types of opiate-based drugs, including heroin, morphine and oxycodone. Developing this vaccine will be a very complicated project requiring years of basic research and testing. They will have to be careful to ensure that the vaccine doesn't reduce the effectiveness of legal, opiate-based drugs that are crucial for medical care. But if they are successful in developing this opiate vaccine, it has the potential to be a powerful new tool to help people suffering from substance abuse to overcome their addiction.

An effective opiate vaccine would hold life-altering potential. Embarking on this research project would not have been possible without Dr. Pentel and his team spending years researching the function of vaccines.

## 2008 Grants Awarded to MMRF Researchers



In 2008, researchers at the Minneapolis Medical Research Foundation received over 100 new grants and awards worth \$23,317,232. Grants were provided by government entities, private industry, foundations, and donations.

## Sponsored Research Projects

### Principal Investigator

Study Title

Funding Source

~ A ~

#### Albrecht, Jeffrey

*Cyclin D1/CDK4 Complex in Hepatocyte Proliferation*  
National Institutes of Health

#### Anderson, David

*Secondary Prevention of Small Subcortical Strokes (SPS3) Study*  
National Institutes of Health

#### Apple, Fred

*Biosite cTnl Pre-clinical Assay Improvement Study*  
Biosite Inc.

#### Apple, Fred

*Sample Analyses for Department of Defense Multisite Clinical Trial to Assess the Performance of the Twin Star Ultrafiltration Catheter in the Treatment of Tibia Fracture Patients at Risk for Compartment Syndrome*  
Twin Star Medical, Inc./  
Department of Defense

#### Apple, Fred

*Study in ACS Patients Presenting to Emergency Department*  
Abbott Laboratories

#### Apple, Fred

*Testing of Bio-Plex 2200 System Cardiac Damage Panel*  
Bio-Rad Laboratories, Inc.

~ B ~

#### Baker, Jason

*Academic Career Development Award*  
University of Minnesota/  
National Institutes of Health

#### Baker, Jason

*Small and Large Arterial Elasticity and HIV Infection: Pilot Study*  
University of Minnesota/  
National Institutes of Health

#### Bart, Bradley

*Renal Denervation in Patients with ESRD and Refractory Hypertension*  
Ardian, Inc.

#### Bart, Gavin

*Methadone Population Pharmacokinetics: Treatment Outcome in Hmong and Non-Hmong*  
National Institutes of Health

#### Bechtold, Joan

*Failure Mechanisms of Joint Replacement*  
National Institutes of Health/  
National Institute of Arthritis and Musculoskeletal and Skin Diseases

#### Brottman, Gail

*Asthma Education Tools - Games Grant*  
Medica Foundation

~ C ~

#### Chen, Shu-Cheng

*Kidney Early Evaluation Program - Data Coordinating Center*  
National Kidney Foundation

#### Collins, Allan

*21st Services Analytical Services Agreement - 2008*  
21st Services

#### Collins, Allan

*AMAG Analytical Services Agreement - 2008*  
AMAG Pharmaceuticals

#### Collins, Allan

*Amgen Analytical Services Agreement - 2008*  
Amgen

#### Collins, Allan

*Baxter Analytical Services Agreement - 2008*  
Baxter

#### Collins, Allan

*Fresenius Analytical Service Agreement*  
Fresenius Medical Care Holdings

#### Collins, Allan

*Global Epidemiology and Outcomes Research - The Relationship Between Post-Transplant Renal Function and Long-Term Kidney Transplant Survival*  
Bristol Myers Squibb

#### Collins, Allan

*L-Carnitine: Trends in Utilization and Associated Clinical Outcomes*  
Sigma Tau

#### Collins, Allan

*Morbidity and Mortality in Home Daily Hemodialysis versus In-Center Hemodialysis*  
NxStage

#### Collins, Allan

*United States Renal Data System - Coordinating Center*  
National Institutes of Health

#### Cramer-Bornemann, Michel

*Using CardioNet Electrocardiography Telemetry to Collect ECG Data During Polysomnography Study*  
Cardionet

# 2008 Grants Awarded, Continued

**Cutts, Diana**

Minnesota Food Support Nutrition Education Program (FSNE)  
Minnesota Department of Human Services

~ D ~

**Davies, Scott**

HCMC Ambulatory Care Grants Support - Center for Urban Health  
Hennepin County Medical Center

**DiAngelis, Anthony**

Bright Smiles Initiative  
United Way

**DiAngelis, Anthony**

Ryan White HIV/AIDS Dental Reimbursement Program  
Health Research Services Administration

~ F ~

**Freeman, Martin**

Enhanced Magnetic Resonance Cholangiopancreatography in the Evaluation of Subjects with a History of Acute or Acute Recurrent Pancreatitis  
Repligen Corporation

**Freeman, Martin**

Evaluating Predictors & Interventions in Sphincter of Oddi Dysfunction (EPISOD)  
Medical University of South Carolina/  
National Institutes of Health

~ G ~

**Gilbertson, David**

State Based Screening for Chronic Kidney Disease - Year 03  
National Kidney Foundation/  
Centers for Disease Control and Prevention

**Goldsmith, Steven**

A Study to Assess the Safety and Tolerability of Oral Medication in Patients with Heart Failure and Renal Insufficiency  
Biogen Idec, Inc.

**Goldsmith, Steven**

Cardiorenal Rescue Study in Acute Decompensated Heart Failure  
National Institutes of Health

**Goldsmith, Steven**

Determining Optimal Dose and Duration of Diuretic Treatment in People With Acute Heart Failure  
National Institutes of Health

**Goldsmith, Steven**

Phosphodiesterase-5 Inhibition to Improve Clinical Status And Exercise Capacity in Diastolic Heart Failure  
National Institutes of Health

**Goldsmith, Steven**

Surgery versus Medical Treatment Alone for Patients with Significant Mitral Regurgitation and Non-schemic Congestive Heart Failure  
National Institutes of Health

**Goldsmith, Steven**

The Minnesota Heart Failure Consortium: A Regional Clinical Center  
National Institutes of Health

**Grimm, Richard**

Action to Control Cardiovascular Risk in Diabetes (ACCORD)  
National Institutes of Health

**Grimm, Richard**

Chiropractic and Self-Care for Back-Related Leg Pain  
Northwestern Health Sciences University

**Grimm, Richard**

Examining the Relationship Between Hormone Replacement Therapy and Cognitive Function  
Wake Forest University

**Grimm, Richard**

Individualized Chiropractic and Integrative Care for Low Back Pain  
Northwestern Health Sciences University

**Grimm, Richard**

Intensive Glycemic Control and Skeletal Health  
University of California, San Francisco/  
National Institutes of Health

**Grimm, Richard**

Programme to Improve Life and Longevity Pilot Study - PILL  
Dr. Reddy's Laboratories Limited

**Grimm, Richard**

Trial to Assess Chelation Therapy  
University of Miami/  
National Institutes of Health

**Grimm, Richard**

Women's Health Initiative  
National Institutes of Health

**Grimm, Richard**

Women's Health Initiative Memory Study  
Wake Forest University

**Gross, Eric**

Emergency Department Sentinel Network for Surveillance of Emerging Infections  
University of California, Los Angeles

~ H ~

**Hansen, Glen**

*Examination of HIV-1 Subtype Diversity and the Role of HIV-1 Viral Load Quantitation by Contemporary HIV-1 Viral Load Monitor Assays*  
Abbott Molecular Inc

**Hansen, Glen**

*Respiratory Antimicrobial Surveillance Project (RASP)*  
University of Iowa

**Henry, Keith**

*A Fixed Background Regimen of Abacavir and Lamivudine in Antiretroviral-naïve HIV-1 Infected Subjects*  
Tibotec Pharmaceuticals Ltd

**Henry, Keith**

*Adult AIDS Clinical Trials Unit (ACTU)*  
University of Minnesota/  
National Institutes of Health

**Henry, Keith**

*HIV Elite Controller Study*  
Massachusetts General Hospital/  
Partners AIDS Research Center

**Henry, Keith**

*Study to Evaluate the Effect of Famotidine and Omeprazole on MK-0518 Pharmacokinetics in HIV-Infected Patients on a Stable MK-0518 Containing Regimen*  
Abbott Northwestern Hospital/  
Merck

**Herzog, Charles**

*USRDS Cardiovascular Special Studies Center*  
National Institutes of Health

~ I ~

**Iber, Conrad**

*Portable Monitoring in the Diagnosis and Management of Obstructive Sleep Apnea*  
Case Western Reserve/  
American Sleep Foundation

**Israni, Ajay**

*Amgen Junior Faculty Grant: Epidemiology of Delayed Graft Function and Renal Allograft Survival*  
Amgen

**Israni, Ajay**

*Ethnicity, Follow Up Care, and Renal Function Monitoring After Kidney Transplantation*  
University of Minnesota

**Israni, Ajay**

*Genomics of Kidney Transplantation - Lab Component*  
University of Minnesota/  
National Institutes of Health

~ K ~

**Kasiske, Bertram**

*Coronary Screening for Kidney Transplantation (COST) Study*  
University of Minnesota/  
National Institutes of Health

**Kasiske, Bertram**

*Genomics of Kidney Transplantation - Clinical Component*  
University of Minnesota/  
National Institutes of Health

**Kasiske, Bertram**

*Long Term Deterioration of Kidney Allograft Function*  
University of Minnesota/  
National Institutes of Health

~ L ~

**Ledray, Linda**

*Prevention of Postrape Drug Abuse: Replication Study*  
Medical University of South Carolina

**Ledray, Linda**

*Sexual Assault Resources - Conference 2008*  
Department of Justice

**LeSage, Mark**

*Active Immunization for Treating Methamphetamine Abuse*  
University of Arkansas/  
National Institutes of Health

**LeSage, Mark**

*Modeling Behavioral Treatments for Stimulant Abuse*  
National Institutes of Health

**Linzie, Brad**

*Technical Consulting Agreement for Histological Services*  
Inspire Medical Systems, Inc.

~ M ~

**Mahoney, Brian**

*Impedance Threshold Value for Improving Standard CPR (ResQ)*  
Advanced Circulatory Systems/  
National Institutes of Health

**Mahowald, Mark**

*Hypoglossal Nerve Stimulation for Obstructive Sleep Apnea*  
Inspire Medical Systems, Inc.

**Maisel, Robert**

*Recovery of Tumor Biomarkers with an Interstitial Ultrafiltration Catheter*  
Twin Star Medical, Inc.

# 2008 Grants Awarded, Continued

**Mullany, Lisa**

*Novel Functions of D-type Cyclins in Hepatocytes*  
National Institutes of Health

**Murray, Anne**

*Fesler-Lampert Chair in Aging*  
University of Minnesota

~ N ~

**Nance, Martha**

*Creatinine Safety, Tolerability, and Efficacy in Huntington's Disease: CREST-E*  
Massachusetts General Hospital/  
National Institutes of Health

~ P ~

**Peine, Craig**

*Study of Boceprevir in Subjects with Chronic Hepatitis C Genotype 1 Who Failed Prior Treatment with Peginterferon/Ribavirin*  
Schering Corporation

**Peine, Craig**

*Safety and Efficacy Study of Boceprevir in Previously Untreated Subjects with Chronic Hepatitis C Genotype 1*  
Schering Corporation

**Pentel, Paul**

*Aktiv-Dry Phase II Development of Micronized Needle-Free Vaccine for Smoking Cessation and Prevention*  
National Institutes of Health/  
National Institute on Drug Abuse

**Pentel, Paul**

*Immunization to Block the Effects of Nicotine*  
National Institutes of Health

**Pentel, Paul**

*Multivalent Vaccine for Opiate Addiction*  
National Institutes of Health

**Pentel, Paul**

*Tobacco Exposure Reduction - Administrative Core*  
University of Minnesota/  
National Institutes of Health

**Pentel, Paul**

*Tobacco Exposure Reduction - Nicotine Exposure Reduction in Rats*  
University of Minnesota/  
National Institutes of Health

~ R ~

**Ranstrom, Ben**

*Taking Steps Together*  
United Way

~ S ~

**Sabey, Karin**

*Case Management Grant - Hennepin County*  
Hennepin County/  
Department of Health and Human Services Ryan White HIV/AIDS Program

**Sabey, Karin**

*Case Management Grant - Hennepin County - Inreach Services*  
Hennepin County/  
Department of Health and Human Services Ryan White HIV/AIDS Program

**Sabey, Karin**

*Community HIV Health Education and Risk Reduction (HERR)*  
Minnesota Department of Health

**Sahadavan, Meena**

*Live Unrelated Kidney Donor and Sibling Follow up Study*  
University of Minnesota/  
National Institutes of Health

**Schmidt, Andrew**

*Fixation using Alternative Implants for the Treatment of Hip Fractures (FAITH)*  
University of Minnesota/  
National Institutes of Health

**Schmidt, Andrew**

*Orthopedics Research Scholarship*  
Smith & Nephew

**Schmidt, Andrew**

*Randomized Clinical Trial of Intramuscular Pressure Reduction by Tissue Ultra-filtration and Pressure Monitoring for the Diagnosis and Prevention of Compartment Syndrome*  
Twin Star Medical, Inc.

**Schulte, Evalyn**

*Critical Care Nurses' Perceptions of Obstacles and Supports for Providing End of Life Nursing Care*  
Minnesota Nursing Association  
Foundation

**Schut, Ron**

*HIV Counseling, Testing, and Referral (CTR) Program*  
Minnesota Department of Health

**Schut, Ron**

*Indigent Metropolitan AIDS Care Collaborative (i-MAC2)*  
Health Research Services  
Administration

**Segal, Barbara**

*Endothelial Function and Oxidative Stress*  
Minnesota Lupus  
Foundation

**Segal, Barbara**

*Scleroderma in QuERI Study*  
Actelion Pharmaceuticals/MD  
Primer

**Snyder, Jon**

*Allograft Outcomes Modelling  
in Renal Transplantation Using  
Available US Registry Data*  
Genzyme

**St. Peter, Wendy**

*Economic Findings from the  
Dialysis Clinical Outcomes*  
Genzyme

~ T ~

**Tiryaki, Ezgi**

*Study to Investigate the Safety  
and Efficacy of Lithium in  
Combination with Riluzole in  
Volunteers with Amyotrophic  
Lateral Sclerosis*  
Massachusetts General Hospital/  
National Institutes of Health

~ W ~

**Wills, Laurel**

*Improving Care for Non-English  
Speaking Families*  
American Academy of Pediatrics

~ Z ~

**Zera, Richard**

*National Surgical Adjuvant Breast  
and Bowel Project (NSABP)*  
The National Surgical Adjuvant  
Breast and Bowel Project  
Foundation

# Board of Directors

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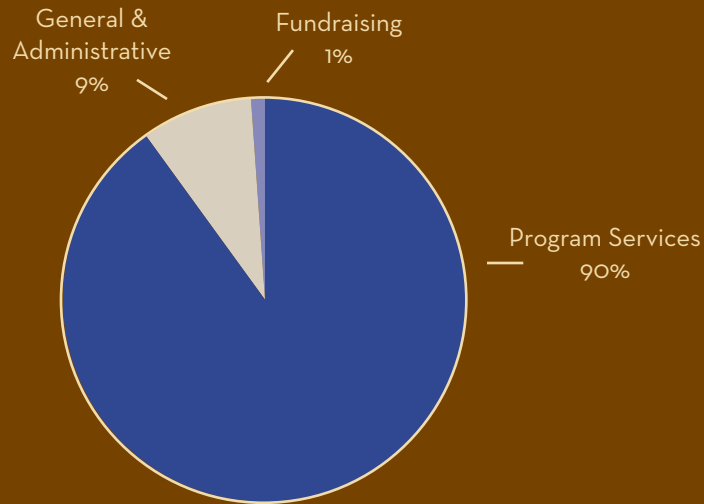


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# Financial Highlights

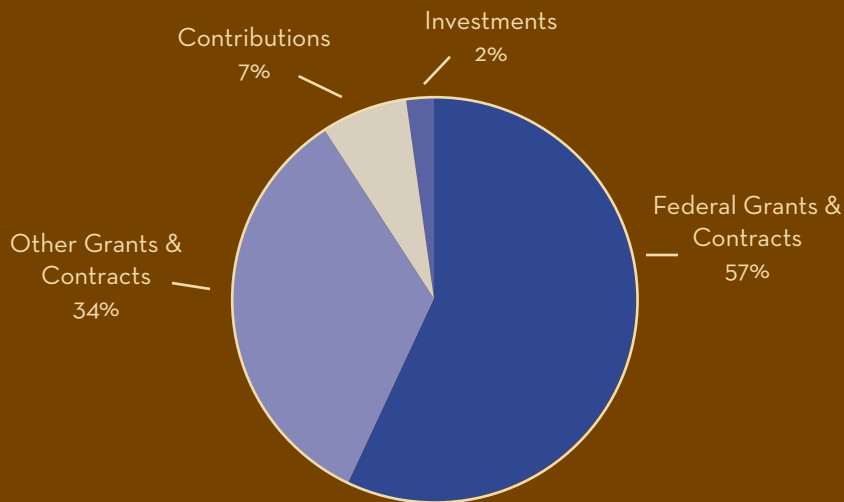
## Distribution of Funds in 2008

In 2008, 90 percent of each dollar contributed to MMRF went directly to supporting research efforts. Nine percent of funds were used to support administrative costs and facilities maintenance. The remaining one percent of funds were used to support fundraising activities. This makes MMRF one of the most competitive and efficient medical research foundations.



## MMRF Funding Sources

Contributions to MMRF come from a variety of sources. While federal funding provides the largest portion of our funding, contributions from individuals and private organizations are crucial to the success of MMRF.



# Statement of Financial Position

December 31, 2008 with comparative information as of December 31, 2007

| <b>ASSETS</b>   | <b>2008</b>                 | <b>2007</b>                 |
|---|-----------------------------|-----------------------------|
| Cash and cash equivalents                                   | \$ 1,967,758                | \$ 1,972,719                |
| Investments   | 16,081,630                  | 23,218,055                  |
| Receivables   |                             |                             |
| Contract and grant  | 5,775,694                   | 5,481,572                   |
| Pledges   | 120,618                     | 122,209                     |
| Prepaid expenses  | 302,565                     | 262,197                     |
| Beneficial interest in perpetual trusts                     | 776,030                     | 1,034,800                   |
| Property and equipment, net                                 | <u>3,002,973</u>            | <u>3,354,276</u>            |
| <b>Total assets</b>   | <b><u>\$ 28,027,268</u></b> | <b><u>\$ 35,445,828</u></b> |
| <br><b>LIABILITIES AND NET ASSETS</b>                       |                             |                             |
| <b>LIABILITIES</b>  |                             |                             |
| Accounts payable  | \$ 1,147,036                | \$ 936,087                  |
| Accrued expenses  | 952,183                     | 864,463                     |
| Deferred revenue  | <u>425,876</u>              | <u>258,587</u>              |
| <b>Total liabilities</b>                                    | <b><u>2,525,095</u></b>     | <b><u>2,059,137</u></b>     |
| <br><b>NET ASSETS</b>                                       |                             |                             |
| Unrestricted  |                             |                             |
| Investment in property and equipment                        | 3,002,973                   | 3,354,276                   |
| Undesignated  | 417,997                     | 737,946                     |
| Designated - other  | 2,352,690                   | 2,838,445                   |
| Designated for investigator directed research and education | <u>2,342,022</u>            | <u>4,366,128</u>            |
| Total unrestricted  | <u>8,115,682</u>            | <u>11,296,795</u>           |
| Temporarily restricted                                      | 7,171,448                   | 7,215,835                   |
| Permanently restricted                                      | 10,215,043                  | 14,874,061                  |
| <b>Total net assets</b>                                     | <b><u>25,502,173</u></b>    | <b><u>33,386,691</u></b>    |
| <b>Total liabilities and net assets</b>                     | <b><u>\$ 28,027,268</u></b> | <b><u>\$ 35,445,828</u></b> |

# Statement of Activities

December 31, 2008 with comparative information as of December 31, 2007

| <b>CONTRIBUTIONS, GAINS, AND<br/>OTHER SUPPORT</b>   | <b>Unrestricted</b> | <b>Temporarily<br/>Restricted</b> | <b>Permanently<br/>Restricted</b> | <b>2008 Total</b> | <b>2007 Total</b> |
|--|---------------------|-----------------------------------|-----------------------------------|-------------------|-------------------|
| U.S. Government contracts and grants                 | \$ -                | \$ 13,367,973                     | \$ -                              | \$ 13,367,973     | \$ 12,378,030     |
| Other contracts and grants                           | -                   | 7,864,311                         | -                                 | 7,864,311         | 9,059,346         |
| Contributions  | 287,051             | 1,306,122                         | 4,099                             | 1,597,272         | 1,883,806         |
| Investment income                                    | 472,518             | (62)                              | 81,445                            | 553,901           | 2,517,175         |
| Other  | 26,242              | 166,303                           | -                                 | 192,545           | 166,792           |
| Change in value of perpetual trusts                  | -                   | -                                 | (258,770)                         | (258,770)         | 3,748             |
| Net assets released from restrictions                | 23,346,147          | (22,749,034)                      | (597,113)                         | -                 | -                 |
| Total contributions, gains, and<br>other support     | 24,131,958          | (44,387)                          | (770,339)                         | 23,317,232        | 26,008,897        |
| <b>OPERATING EXPENSES</b>                            |                     |                                   |                                   |                   |                   |
| Research and education                               | 22,811,757          | -                                 | -                                 | 22,811,757        | 22,710,846        |
| General and administrative                           | 2,304,103           | -                                 | -                                 | 2,304,103         | 2,218,534         |
| Fundraising  | 309,770             | -                                 | -                                 | 309,770           | 436,118           |
| Total operating expenses                             | 25,365,498          | -                                 | -                                 | 25,425,630        | 25,365,498        |
| <b>GAIN (LOSS) FROM OPERATIONS</b>                   | (1,293,672)         | (44,387)                          | (770,339)                         | (2,108,398)       | 643,399           |
| <b>CHANGE IN UNREALIZED GAINS ON<br/>INVESTMENTS</b> | (1,887,441)         | -                                 | (3,888,679)                       | (5,776,120)       | (317,336)         |
| <b>CHANGE IN NET ASSETS</b>                          | (3,181,113)         | (44,387)                          | (4,659,018)                       | (7,884,518)       | 326,063           |
| <b>NET ASSETS, BEGINNING OF YEAR</b>                 | 11,296,795          | 7,215,835                         | 14,874,061                        | 33,386,691        | 33,060,628        |
| <b>NET ASSETS, END OF YEAR</b>                       | 8,115,682           | 7,171,448                         | 10,215,043                        | 25,502,173        | 33,386,691        |

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