Research Fund for the Prevention and Treatment of Kidney Disease

University of Maryland
School of Medicine

The Global Burden of Kidney Disease

The cumulative global cost for treatment of kidney disease in terms of dialysis and transplantation over the next decade is predicted to exceed $1 trillion. This economic burden will strain the health resources of most developed countries. Lower income countries will find it difficult, if not impossible, to meet this burden.

World-wide, it is conservatively estimated that over 350 million people suffer from Chronic Kidney Disease (CKD), more than the entire U.S. population. CKD can strike anyone and is found prevalently in lesser developed countries and among underserved communities. Its most common causes are hypertension and diabetes. According to the World Health Organization, some African countries record that half their adult population suffers from high blood pressure.

Up to one third of populations in some Pacific Island countries have raised blood glucose levels. In India, the average age of an End Stage Renal Disease (ESRD) patient is a mere 47 years old. The prevalence of hypertension in Blacks in the United States is among the highest in the world and is growing at a staggering rate.

CKD has been associated with nearly a ten-fold increase in cardiovascular mortality. Observations throughout the developed and lesser-developed world suggest that CKD is reaching epidemic proportions. With increased awareness, however, and early detection, CKD can be inexpensively treated and its progression to ESRD slowed. Transplantation, when indicated, can not only extend life, but improve the quality of life, as well.

The Power of Partnership: A Comprehensive Framework for the Prevention and Treatment of Kidney Disease

University of Maryland School of Medicine and the University of Maryland Medical Center

The University of Maryland Medical Center (UMMC) and the University of Maryland School of Medicine (UMSOM) share and jointly pursue a vision of global leadership in health care, medical education and biomedical research. University of Maryland has distinguished itself as a leader in bringing together world-renown expertise and cutting-edge resources to stem the progression of non -communicable diseases, such as diabetes, high blood pressure and CKD and reducing the human and economic costs associated with these diseases. UMMC accommodates one million patient visits a year.

The School of Medicine is the anchor of the academic health center. It is the first public and fifth oldest medical school in the US. With one of the most productive faculties in the country, the UMSOM has been recognized by the Association of American Medical Colleges as among the fastest-growing research enterprises nationwide. In direct grants and contract expenditures, UMSOM ranks 6th among the country's 76 public medical schools and 16th among all 138 medical schools, public and private. It maintains a portfolio of research and service initiatives in more than 23 countries around the world.

Division of Transplantation

With a reputation for innovation and technical and surgical excellence, the UMSOM Division of Transplantation is one of largest, most prolific and comprehensive transplant programs in the country. The program provides patient access to the latest advances in transplant technology and immunosuppressive medication therapy, as well as to the top-notch talent and broad resources of the UMMC and the UMSOM Department of Surgery. It is one of few centers nation-wide to offer Simultaneous Bilateral Nephrectomy and Transplant, where both kidneys are removed and a kidney transplant is performed in the same operation. In 2009, the University of Maryland became the first hospital in Maryland, and only the third in the United States, to perform a single-port, natural orifice kidney removal surgery through the navel for a living kidney donor. Today, University of Maryland transplant surgeons have performed more Single Incision Laparoscopic Surgeries (SILS) on living donors than in any other center in the nation.

"We want everyone to donate. We're passionate about bringing kidney awareness to the forefront and in motivating people to give the gift of life. People should really come forward and donate."

- Anonymous Grateful Patients

Division of Nephrology

The clinical programs of the Division of Nephrology encompass early and advanced chronic kidney disease, acute renal failure, dialysis and transplantation. The expertise of its faculty physicians has led to the division's impressive rank of ninth in the nation in the *U.S. News and World Report's* 2012-13 Best Hospitals rankings. As one of the largest nephrology programs in the country, the division has more than tripled in faculty size over the last 20 years. It works closely with the Department of Surgery for kidney transplants and offers the latest therapies to reduce the side effects of anti-rejection drugs.

Transform Medicine: Partner with a Leader

When you partner with the University of Maryland School of Medicine you partner in a mission of transforming medicine beyond imagination, and join with nearly 3000 clinician scientists who share this mission.

The University of Maryland is second in the country for kidney transplant volume. The Divisions of Transplantation and Nephrology receive more than 600 new patient referrals each year. University of Maryland clinicians follow more than 3,500 patients transplanted over the last 2 decades, as well as over 1,000 patients on the organ transplant wait list. In the most current year, the Division of Nephrology provided over 18,000 inpatient renal consultations, 5,200 inpatient hemodialysis procedures, medical care for 300 renal transplant patients and over 5,000 outpatient follow-up visits.

The Research Fund for the Prevention and Treatment of Kidney Disease

The Research Fund for the Prevention and Treatment of Kidney Disease advances medical research, helps educate and train the next generation of clinician scientists, and ensures high-quality, state-of-the-art patient care. The private support of individuals, industry, and foundations help:

- Make the most advanced technology in the early detection, prevention and treatment of chronic kidney disease accessible to patients in Maryland, throughout the country and around the world.
- Recruit and retain world-class researchers and academic/medical talent who will discover solutions to the most challenging issues surrounding kidney disease and quickly translate these solutions from bench to bedside.
- Advance genomic discoveries that lead to more effective individualized treatments.
- Develop novel therapies that delay or stop progressive kidney failure and prolong the survival of donated organs.
- Investigate viable, lower costs alternatives to transplantation for replacement of kidney function.
- Eliminate or mitigate the factors contributing to the racial and ethnic disparities in the prevalence of kidney disease.

"If I had more private funding, I could bring together transformative scientists to develop new strategies — for instance, for doing transplants without immunosuppression and the risk of serious side effects. In five to ten years, with the right people in place, we would be able to solve the problem of immune tolerance in transplants."

- Stephen T. Bartlett, MD
The Peter Angelos Distinguished Professor & Chairman,
Surgeon-in-Chief and Senior Vice President, UMMS

Accelerate The Momentum: Help Reduce the Global Burden of Kidney Disease

Private gifts can be made outright, pledged over a five-year period, or structured through a variety of financial and estate planning vehicles including bequests and gifts which pay an income for life. Named endowments are an important investment in the future of medicine, providing a legacy opportunity with a stream of perpetual support for internationally recognized faculty members. Philanthropy provides flexible funding that is crucial for solving important questions that will improve quality of life for patients with hypertension, kidney disease, and those that have received an organ transplant. Please visit fundformedicine.org to make a gift today.

Research Overview

The Division of Nephrology Laboratory of Molecular Physiology is seeking to define the molecular basis of human sensitivity to the blood pressure-raising effects of salt. This would allow more specific non-pharmacologic and pharmacologic approaches to treat, and perhaps cure, the single most important disease process leading to progressive cardiovascular disease in the general population.

The **University of Maryland Baltimore Polycystic Kidney Disease Center** strives to cure the single most important cause of genetic kidney disease, which represents 10% of chronic kidney disease. The center has recruited experts in biochemistry, genetics, and structural biology to tease out the molecular causes for cyst development in the kidney, which leads to renal failure. Already our group has found two defective genes which are likely causative.

In collaboration with the Institute for Genome Sciences we are examining the **microbiota of transplant patients** and how those change with different immune responses. We are also studying **gene expression** in kidney transplant biopsies.

One important goal is to identify risk factors as to **why people with kidney disease develop more rapid cardiovascular disease.** With more than 10 years of support from The National Institutes of Health, this group has enrolled patients in a large ongoing cohort study which has, and will, provide seminal observations explaining why people with kidney disease experience earlier and more rapid heart disease progression.

"We need the freedom to test novel ideas. We need the freedom to say, 'What if?' To do something very different. That's how new fields open. Risk-taking is where philanthropy is so important. Philanthropy can allow us to go after novel ideas that allow us to accomplish great things. We have to be thinking about how to cure a disease, not just how to treat it!"

- Matthew Weir, MD
Professor and Head,
Division of Nephrology

Kidney donation is an essential part of transplantation today. Yet, **are all potential living donors safe for kidney donation?** Our group is in its sixth year of NIH funding to examine whether kidney donation is safe for everyone from a cardiovascular standpoint. Many different factors may influence risk such as pre-donation level of blood pressure, cholesterol, and glucose. We are using sensitive techniques to measure these and other biomeasures of cardiovascular risk longitudinally over time to correlate with blood vessel injury.

Mechanisms of Tolerance: Achieving tolerance remains a primary goal in transplantation. One important area of focus is on the role of migration, trafficking, and secondary lymphoid organ structure as crucial regulatory processes that determine whether immune interactions result in immunity versus tolerance. A key area of investigation is the study of the **composite tissue allografts** containing vascularized bone marrow to promote tolerance to kidney transplants.

We Are Transforming Medicine

We are pioneering, discovering solutions to today's most challenging issues and forging new pathways for discovery tomorrow.

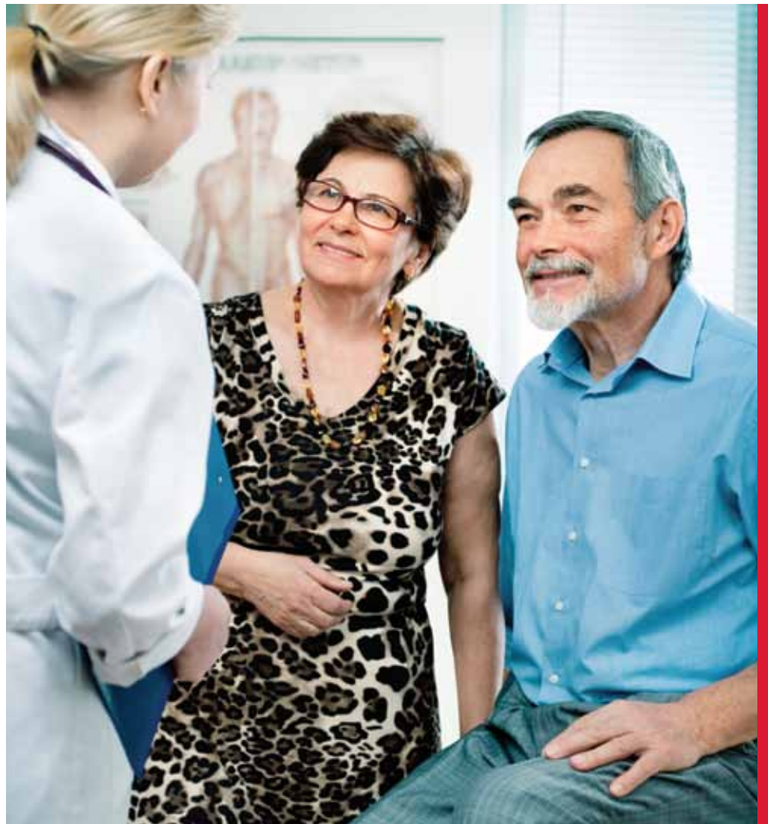
Did you know? We are engaged in innovative translational research to develop evidence-based therapies to delay or stop progressive kidney failure, to prolong the survival of donated organs, and to develop cost-effective alternatives to transplantation for replacement of kidney function.

We are authoritative, leading experts who are creating expertise for the future.

Did you know? New tests are currently in development to provide more detailed and individualized care for patients with hypertension and kidney disease.

We are socially responsible, serving the needs of all patients, providing access to care, and eliminating disparities.

Did you know? Genetic variation on chromosome 22 is a major contributor to the increased risk of kidney disease in African origin populations. We are examining what role this region plays in disease occurrence, progression, and outcomes in 300 kidney transplant living donor-recipient pairs in which both individuals are of African descent. This is probably one of the largest cohorts in the country.



"The road to transplant was indeed very difficult. Every day was a challenge. But our surgeons, nephrologists, nurses, interns and patient coordinators made us feel very comfortable. The medical and surgical teams at Maryland are really the best. We plan to help them as we move forward."

- A grateful kidney recipient and a grateful kidney donor

To learn more about research that is transforming lives, and the numerous opportunities to support **The Research Fund for the Prevention and Treatment of Kidney Disease and the Campaign for the University of Maryland School of Medicine,** contact:

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