Research Frontiers

INVESTIGATING TRANSPLANT REJECTION

Peter S. Heeger, MD, Director of the Transplant Immunology Research Program and Professor of Medicine in the Division of Nephrology, was awarded a five-year, $2 million National Institutes of Health (NIH) study to investigate the mechanisms that underlie the rejection of transplanted organs.

A long-term goal of the project is to use information obtained from animal models to design therapies that prolong transplant survival in patients. Fifty percent of kidney transplant patients will experience organ failure within ten years. Heart transplants fail within five to seven years, and lung transplants have even shorter lives. Late organ loss can be caused by toxic side effects from medications, undertreated immune reactions, infections, and recurrent disease.

Dr. Heeger's studies focus on understanding a certain component of the immune response, called complement, and how it contributes to the long-term injury of the transplanted organ. Dr. Heeger and his colleagues hope to design new treatments to block complement activity and potentially lengthen transplanted organ survival. Dr. Heeger also runs a multicenter NIH-supported grant testing the utility of biomarkers that could predict transplant rejection before it is clinically evident.

"Findings from these two studies," says Dr. Heeger, "will hopefully permit transplant physicians to individualize treatments for each patient so we can minimize side effects, prolong graft survival, and improve patient health."

Peter S. Heeger, MD

To learn more, visit www.mountsinai.org/TRP and www.mountsinai.org/Heeger.

PICTURE THIS

The Translational and Molecular Imaging Institute has received a $2 million high-end instrumentation grant from the National Institutes of Health National Center for Research Resources. The grant will be used to purchase a state-of-the-art micro MRI scanner that will help researchers better understand disease pathology and molecular mechanisms in vivo.

Zahi A. Fayad, PhD

"This high-performance, small-animal magnetic resonance imaging system allows us to study the fundamental mechanisms of biological function, ultimately leading to new advances and treatments for diseases," says Zahi A. Fayad, PhD, Interim Director of the Translational and Molecular Imaging Institute and Professor in the Departments of Radiology and Medicine (Cardiology).

Called a 7 Tesla large-bore MRI, the new scanner allows for the imaging of live animals or human specimens up to 16 centimeters in diameter. It is also equipped with coils and anesthesia accessories. The unique imaging instrument is also compatible with the clinical scanners currently used at The Mount Sinai Hospital, so it will enhance and accelerate the ability to share critical information from the laboratory with physicians and patients.

"From bench to bedside, protocols and molecular technologies developed on this system can immediately be transported to current clinical scanners for human use," explains Cheuk Ying Tang, PhD, Principal Investigator on this project, Director of the In-Vivo Molecular Imaging Shared Facility, and Assistant Professor of Radiology and Psychiatry.

To learn more, visit www.mountsinai.org/TMII.

Young Pioneers

UNDERSTANDING THE KLF6 GENE

As a medical student at Mount Sinai, Goutham Narla, MD, PhD, Assistant Professor of Medicine and of Genetics and Genomic Sciences, discovered the KLF6 gene in the laboratory of Scott L. Friedman, MD, Professor of Medicine and Chief of the Division of Liver Diseases. As a faculty member, he continues to make new discoveries about the role of KLF6 that have laid the groundwork for improving the diagnosis and treatment of malignancies like breast, prostate, and lung cancer.

Goutham Narla, MD, PhD

The breakthrough, which was published in *Science*, is now being used by Dr. Narla for potential applications in the treatment of metastatic cancer. Dr. Narla received the Howard Hughes Medical Institute Physician-Scientist Early Career Award for his research last year.

Dr. Narla's team identified a splice variant of the KLF6 gene, known as KLF6-SV1, which causes cancerous cells to grow out of control. The group found that a small RNA molecule can inhibit this splice variant that serves as an accelerator for cancer growth and decrease tumor size in mice. These results were published in the *Journal of Clinical Investigation*.

While Dr. Narla is hopeful to move to a Phase 1 trial in patients soon, some of his discoveries can already be translated from bench to bedside. He says, "If a tumor is aggressive, we should treat it with chemotherapy and follow it more closely. If it isn't, we would spare patients the side effects of these drugs. KLF6-SV1 helps tell us that."

To learn more, visit www.mountsinai.org/Narla.