

Neuroprotection in Parkinson Disease: Clinical Center

*Primary Investigator: Richard S. Burns, M.D.
Funding Agency: National Institute for Neurological Disorders and Stroke*

More than 500,000 people in the U.S. are affected by Parkinson disease, with 50,000 new cases each year. The annual cost of care is estimated to be \$10 billion.

This project proposes that the SIU Parkinson Disease Center participate in the design and performance of a large, multicenter clinical trial of neuroprotective agents in Parkinson disease. The specific aims are to identify compounds that have potential as neuroprotective agents in Parkinson disease; design clinical trials to test the effects of experimental compounds on the rate of progression of Parkinson disease; conduct pilot studies of selected compounds to determine tolerance and safety of their use in man; and conduct a large, multicenter clinical trial to determine if selected compounds retard the rate of progression in Parkinson disease. The objective is to identify safe and effective compounds that retard the clinical progression of Parkinson disease.



Improving Radial Artery Preservation for Coronary Artery Bypass

*Primary Investigator: Jacquelyn Quin, M.D.
Funding Agency: William E. McElroy Charitable Foundation*

Coronary artery bypass grafting (CABG) is the most commonly performed operation in cardiac surgery. The operation has undergone considerable refinement over the past few decades with improved patient outcomes. One such refinement is use of the internal mammary artery as a bypass conduit. This artery, which lies beneath the breastbone, has long-

term patency results that are superior to grafts that are made using the saphenous vein. Because of the excellent results seen with the internal mammary, other arteries have been studied for similar use. The radial artery in the forearm is one potential candidate. The long-term patency of this artery may be similar to that of the internal mammary artery, and its removal from the forearm is straightforward.

One drawback of radial artery is the possibility of spasm, which occurs in approximately 10 percent of arteries that are used for the CABG operation. This project will study whether the radial artery may develop ischemia, or the lack of oxygen, after it is removed from the arm, and whether such ischemia may contribute to the vessel's propensity for spasm. Specifically, the study will compare two segments of the radial artery from patients who undergo CABG using this artery. The first segment will be taken immediately after the vessel is removed from the arm. A second segment will be taken just before the artery is grafted onto the heart. The duration of time that the vessel is stored in blood solution will be considered as the period of ischemia. The two segments of artery will be compared with respect to architecture and chemistry. The results of this study could lead to additional studies that further explore arterial spasm and be used to apply for further funding for possible treatments to alleviate spasm.



Controlling Autoreactive T Cells With Ly49A

*Primary Investigator: Mary Pauza, Ph.D.
Funding Agency: The American Diabetes Association*

Normally, pancreatic islet beta cells produce insulin to facilitate use of glucose as a source of energy throughout the body. In type 1 diabetes, autoreactive T cells destroy islet beta cells, resulting in insulin insufficiency and toxic hyperglycemia.

Surprisingly, the mobility and specificity of T cells makes them a potentially useful tool to treat autoimmune diabetes. Dr. Pauza has altered T cells by causing them to express an inhibitory receptor, Ly49A. Her team's preliminary studies suggest that these modified T cells may help prevent development of type 1 diabetes. She hypothesizes that modified T cells will not contribute to type 1 diabetes as unmodified cells do, but instead will suppress disease progression by competing with disease-causing T cells for available nutrients and/or space, or by direct interactions with neighboring cells.

Currently Dr. Pauza is assessing how Ly49A affects normal T cell function. This includes identifying the molecular mechanisms responsible for Ly49A mediated T cell suppression. In addition, her lab is mutating Ly49A to improve its suppressive effects and evaluating how effective Ly49A T cells are at inhibiting diabetes. Information gained through these studies may lead to novel therapies to treat individuals newly diagnosed with type 1 diabetes or prevent the disease from occurring in the first place.

For more information about these projects, contact the Office of Research and Faculty Affairs at 217-545-7936.