Regenerative Cell Therapy: From Molecules to Medicine

Dr. Roham Zamanian, Dr. Marlene Rabinovitch, and Dr. Duncan Stewart

At the fourth annual Evans Family Lecture at Stanford University Medical Center, distinguished speaker Duncan J. Stewart, M.D. outlined his efforts to turn molecular advances made in the laboratory into clinical treatments for patients with PH.

Stewart is currently Professor of Medicine and the Dexter Man Chair of Cardiology at the University of Toronto. He completed his medical degree and residency at McGill University, as well as a fellowship at the University of Freiburg, Germany. Prior to accepting his current roles, Stewart served as Chief of Cardiology at St. Michael's Hospital in Toronto. He has published more than 100 peer-reviewed manuscripts and is a member of several national and international research organizations and editorial boards.

In his presentation, Stewart noted that current efforts to treat PH focus on eliminating blood vessel constriction through medications like Flolan. However, many patients either don't respond or experience serious side effects, such as infection and pain. Because many PH cases are caused by the inherited PPH gene, Stewart and his team began to explore genetic treatments for the disease. They have demonstrated that injecting cells infused with preventative genes such as eNOS (endothelial nitric oxide synthase) into the lungs of mice with PH not only alleviates symptoms, but also slows the progression of the disease.

Stewart has taken this idea a step further by using cell-based gene therapy to actually reverse the damaging effects of PH. His preclinical trials involving mice suggest that this approach holds the promise of regenerating healthy vessels in the human lung. Stewart cited the success of this approach for other leaders in the field like Dr. Marlene Rabinovitch, Director of Research for the Vera Moulton Wall Center, who revealed that blocking serine elastase, a cellular protein, can stimulate the regrowth of viable vessels.

Stewart concluded by discussing the Pulmonary Hypertension and Cell Therapy Trial (PHACeT). He outlined his design for this first-ever human trial of regenerative cell and gene therapy for pulmonary hypertension patients. The trial is scheduled to begin in 2005.