

# Forskning på Genterapi

## Genterapi

En genterapistudie för MPS VII Sly är planerad att påbörjas hösten 2006 på Washingtons universitet i St. Louis. Målet för studien kommer vara blodsystemet. I den här studien kommer stamceller från benmärgen från patienter med MPS VII att isoleras och en funktionell kopia av den defekta genen kommer tillföras de cellerna. Inte alla patienter med MPS VII kommer uppfylla inklusionskriterierna. Varje patient kommer utvärderas av ett team läkare för att se om de passar.

För mer information kontakta; Mark S. Sands, Ph.D Associate Professor of Medicine and Genetics Washington University School of Medicine [msands@im.wustl.edu](mailto:msands@im.wustl.edu)

## **Drs. Katherine Ponder och Mark Haskins**

### **"Retroviral vector-mediated gen terapi för MPS I"**

Hematopoietic stem cell transplantation can reduce some manifestations, but has a 15% mortality rate, costs \$130,000, and requires a compatible donor. Enzyme replacement therapy can also reduce some symptoms, but costs over \$500,000 per year for an adult, requires a weekly infusion, and is not available to all patients. The development of an effective and safe gene therapy for MPS I could have a dramatic positive impact on the lives of patients We previously demonstrated that neonatal intravenous injection of a gamma retroviral had a truly remarkable effect in both mice and dogs with MPS I, with elimination or reduction in all major clinical manifestations. The aims of this project are to: 1) reduce the risk of insertional mutagenesis 2) attempt to prevent an immune response 3) analyze the duration of efficacy and evaluate for toxicity in a long-lived large animal model (dog). If successful, this study may hasten the development of a simple and effective treatment for newborn patients that will reduce or prevent the devastating clinical manifestations of MPS I.

## **Dr. Alessandra Biffi**

### **" safe gene therapy approaches for MPS I"**

San Raffaele Telethon Institute for Gene Therapy (HSR-TIGET) Milano, Italy  
the main goal of the project is the identification of a novel gene therapy strategy capable of efficiently deliver therapeutic levels of functional IDUA enzyme to all disease sites of MPS I mice, and of correcting disease manifestations, in the absence of toxicity. To this goal, based on our expertise in other LSD models, we will compare two gene therapy protocols based on advanced generation viral vectors, which might over-come the major limitations of currently available therapies. This work will allow us to identify and further develop towards clinical application the most promising and efficacious gene therapy strategy for the treatment of MPSI.

## **Dr. Mark Haskins**

### **"Lentiviral Vector Therapy for Canine MPS VII"**

University of Pennsylvania, School of Veterinary Based upon experiments in mice, a clinical trial has been approved for our collaborator, Mark Sands, PhD, to use a lentiviral vector containing the human gene for the enzyme that is deficient in mucopolysaccharidosis VII to treat bone marrow cells in culture and then return them to the children with MPS VII.

Currently, the clinical trial is on hold while Dr. Sands collects more safety data for the FDA. We have a well-characterized dog model of MPS VII and believe it is essential to test the safety and efficacy of this therapy in MPS VII dogs prior to its use in children. We also have successfully treated MPS VII dogs intravenously with a retrovirus vector at three days of age dramatically improving the skeletal, ocular, and cardiac lesions. Five treated dogs are currently more than 6 years post-treatment and are being maintained to evaluate possible long-term side effects of therapy, together with four dogs treated by intravenous, neonatal adeno-associated virus vector gene therapy.