

A look inside the lab



Children's launches multi-pronged genetic study of autism

Supported by a grant from the Nancy Lurie Marks Foundation, Children's Hospital Boston has begun to seek the genetic causes of the autistic spectrum disorders in a comprehensive, multidisciplinary study. Preliminary results, hoped for in a year or two, could shed light on autism's biology and point the way to new tests and treatments.

The effort begins in Children's Developmental Medicine Center, which plans to enroll 100 to 150 children age 2 years and older annually. Led by Janice Ware, PhD (above, with patient Max Sours), and Leonard Rappaport, MD, the center will conduct evaluations of the children and their families and develop behavioral profiles that can be correlated with genetic data.

The hospital's Genomics Program will then conduct DNA analyses of the participants and a matched control group of 150 unaffected children. Led by Louis Kunkel, PhD, and Ingrid Holm, MD, PhD, researchers will look for genetic variations shared within families and correlate them with autistic traits. They will also analyze the genes of participants' white blood cells to determine which are turned "on" and "off" in the different autistic spectrum disorders. Children's Informatics Program, led by Isaac Kohane, MD, PhD, will lend computational tools to help spot subtle genetic patterns and weed out chance, false-positive findings.

The Neurobiology Program, headed by Michael Greenberg, PhD, will further support these efforts by examining the connection between autism, a protein called brain-derived neurotrophic factor (BDNF)—which regulates many aspects of brain development and function—and several genes known to regulate BDNF. Mutation of MeCP2, a gene that regulates BDNF, has already been linked to Rett syndrome, which is characterized by mental retardation and autistic behaviors.

"Our objective is to involve the best scientific minds so we can understand the puzzle of autism," says Rappaport. "We no longer want to be limited in how we can help these children."

To learn more about supporting autism research at Children's Hospital Boston, contact Donna Richardson in the Children's Hospital Trust at (617) 355-2061 or donna.richardson@chtrust.org.

Cataloging proteins

Space is being readied in Children's Hospital Boston's Enders research building for a \$2.6 million Proteomics Center, where scientists will be able to conduct large-scale studies of proteins to determine which ones each gene codes for, how their function is regulated and what these proteins do.

The state-of-the-art proteomics facility—one of just a handful in the Boston area—will offer the latest equipment for protein separation and several state-of-the-art mass spectrometers, which detect, quantify and analyze proteins to help determine their structure and characteristics. This technology will enable Children's researchers to identify and quantify the proteins in a cell, tissue or even a complete organism—information researchers hope will yield big dividends in medicine.

"One way proteomics can help is in diagnosing genetic diseases in newborns," says Keith Solomon, PhD, administrative director of the center. "Right now they undergo a number of blood tests for a variety of diseases, but there are hundreds of other tests that could be performed. You just wouldn't want to subject a child to that many blood draws, and the cost would be astronomical. With proteomics it might be possible to test for everything with a single blood draw."

Expected to open in April 2005, the Proteomics Center's director is Hanno Steen, PhD, a leader in the field. "Proteomics is an unprecedented and powerful means to analyze the protein complement of cells, tissue and body fluids," he says. "I think it will open new venues for faster and more specific early diagnoses of numerous diseases. I'm very excited that Children's is investing in this technology."

For an interactive feature on proteomics at Children's, visit www.childrenshospital.org/research/proteomics

To learn more about supporting the Proteomics Center at Children's Hospital Boston, contact Jane Hamel in the Children's Hospital Trust at (617) 355-8833 or jane.hamel@chtrust.org.

