Williams Syndrome: A Model for Linking Genes, Neural Systems, and Social Phenotype Program Project (HD33113-14)

Ursula Bellugi, EdD, Program Director

**Complex Social Phenotype in WS**

Ursula Bellugi is a Professor at The Salk Institute for Biological Studies, Director of the Laboratory for Cognitive Neuroscience, and Director of the multidisciplinary, NICHD funded (HD33113-14), Program Project entitled: *Williams syndrome: A model for linking Genes, Neural systems, and Social phenotype.*

One of the most compelling features of WS is the distinctive social profile. By developing new avenues for understanding the ties between genes, neural and cognitive functions, and behavior in WS, Dr. Bellugi’s research incorporates innovative technologies and probes for behavior, as well as measures of psychophysiology, and brain activity, such as event-related potentials (ERP).

In forming the Program Project, she has brought together scientists from several very different disciplines in an integrated collaboration aimed at understanding the links between social-affective functions and social behavior and the underlying neurobiological and molecular genetic bases of WS.

**Eric Halgren, PhD**

**Neuroimaging of Social Circuitry**

Dr. Halgren is the co-director of the Multimodal Imaging Laboratory at the UCSD Department of Radiology where his research integrates hemodynamic, electromagnetic, and structural imaging. His research under the Program Project combines functional magnetic resonance imaging (MRI), magnetoencephalography (MEG), and electroencephalography (EEG), for high-resolution spatiotemporal mapping of brain activity during cognition. The aim of this research with WS is to identify anatomical and physiological circuits linked to the unique WS social-behavioral phenotype.
**Alysson Muotri, PhD**  
*Modeling WS Using Human Neurons*

Dr. Muotri is an Assistant Professor at UC San Diego's Department of Pediatrics, Department of Cellular and Molecular Medicine, and Rady Children's Hospital. His accomplishments include using stem cells to study possible causes, and cures, for autism and other mental disorders. The goal of his research under the Program Project is to identify characteristics of disease neurons in William Syndrome and to address the interplay between gene expression and the WS social phenotype. Elucidating the links between genes, neural circuits, and social-affective behavior may provide fundamental insight into the mechanisms responsible for human social behavior.

**Katerina Semendeferi, PhD**  
*Cellular Architectonics and Local Circuits*

Dr. Semendeferi is an Associate Professor in the Department of Anthropology and the Graduate Program in Neurosciences at UC San Diego where she is involved in comparative studies of hominid brains and analysis of neuronal developmental in autism. The goal of her research under Program Project is to examine the microanatomical neural organization of the brain structures implicated in social behavior in Williams syndrome compared to typically-developed post mortem brain tissue.

**Julie Korenberg, PhD, MD**  
*Gene Networks for Social Cognition in WS*

Dr. Korenberg is the Professor of Pediatrics and the Director of the Center for Integrated Neuroscience and Human Behavior at the Brain Institute. She is an internationally recognized leader in human and molecular genetics. She has dedicated her career to understanding the genetic underpinnings of Down Syndrome and Williams Syndrome, advancing development of better treatments and prevention methods. As a critical project of the Program Project, Dr. Korenberg deploys mature technology from a cross disciplinary team to accelerate and integrate research on the genetic determinants of social behavior in Williams syndrome with respect to brain development, function, social behavior and correlated psychophysical state.