Susan Bookheimer, Ph.D.
M.I.N.D. Institute Distinguished Lecturer Series – April 11, 2007

Biographical Information
Susan Bookheimer, Ph.D., is professor of psychiatry and psychology in the David Geffen School of Medicine at the University of California, Los Angeles. She is a clinical neuropsychologist whose work spans both basic research and clinical practice. Dr. Bookheimer has been active in pediatric imaging since the inception of functional MRI in the early 1990s, and has focused on imaging developmental disorders at UCLA for over ten years. Her experimental expertise includes structural and functional Magnetic Resonance Imaging (sMRI, fMRI), positron emission tomography (PET), sodium Amytal examinations (Wada tests) and intraoperative electrocortical stimulation mapping (ESM), as well as classical neuropsychological approaches.

Dr. Bookheimer received her bachelor’s degree from Cornell University in 1982 and her Ph.D. in clinical psychology with a specialization in neuropsychology in 1988 from Wayne State University. She interned at Yale University and was a lecturer in neurosurgery at Yale before accepting a postdoctoral fellowship at the National Institutes of Health. She has been a member of the UCLA Faculty since 1993.

Dr. Bookheimer has worked in the UCLA Center for Autism on various brain imaging projects for the past 8 years through UCLA’s CPEA grant, as principal investigator of the imaging project “Functional MRI of Social Communication in autism”. In addition she is principal investigator of the Imaging Core for UCLA’s Center grant on ADHD and for the Autism Center’s new Autism Centers of Excellence program. Dr. Bookheimer serves on the Scientific Advisory Board for the HELP Group, which runs the largest school for children with autism in the country. Dr. Bookheimer has served on the NIMH Council Work Group on MRI Research Practices and on the NIH Working Group on Pediatric Imaging, and is co-leader of the CPEA-STAART Neuroimaging subcommittee.

Presentation Abstracts

Neural Basis of Social Communication Deficits in Autism: Insights from Functional Imaging (4 pm)
Research using fMRI has indicated several areas of systems-level brain dysfunction that may underlie many features of autism. This talk will present a series of studies in our lab examining fMRI during social-emotional tasks. Using data from face recognition, emotional face processing, gaze direction, reward processing and imitation/observation studies, we will argue that a commonality underlying the major features of autism is dysfunction in the mirror neuron system. This system, found originally in monkey single unit recording studies, involves brain areas that respond both during the execution and observation of behavior. Neurons in these regions communicate with subcortical systems involved in affect and reward processing via the insula. A dysfunction in this system would account for a range of symptoms including imitation, joint attention, affect processing, gaze following, and response to reward. Variations in the degree to which this system is dysfunctional appear to correlate with symptom severity. Focusing on this system may allow us to tailor treatments that may affect a range of behaviors.

Brain Imaging in Autism (6 pm)
Why do children develop autism? Although it is known that genetics plays a major role in risk for autism, these genes must affect the brain before influencing behavior. The discovery of functional magnetic resonance imaging (FMRI) in the early 1990’s has revolutionized the study of childhood disorders generally and autism specifically. FMRI allows us to observe brain activity while children perform mental tasks we know are affected in autism. These studies have shown that portions of the human brain are specialized for different aspects of social behaviors, including following eye gaze, responding to human faces, and imitating the behaviors of others. Abnormalities in some of these brain systems appear to be pervasive in children with autism, even those who are high functioning. Underlying these brain abnormalities are very subtle differences in brain structure that changes in development. Recent data has shown that the environment can influence many aspects of brain development. This talk will review recent findings in brain structure and function in autism and will suggest ways that brain imaging may help future studies of intervention in autism.