On October 30, 2015 the sixth annual Meeting of the Minds Symposium, entitled “Autism Spectrum Disorders,” took place at the Charles B. Wang Center at Stony Brook University. Each year, the symposium features lectures by renowned neuroscience experts and celebrates the ongoing achievements of Stony Brook faculty in the field that may lead to applications that ultimately benefit patients. The symposium is sponsored annually by the Stony Brook University Neurosciences Institute with support from the departments of Neurology, Neurosurgery, Psychiatry, Neurobiology and Behavior; as well as by Stony Brook University Hospital. This year’s event attracted more than 260 physicians, nurses, researchers, students, caregivers, and other healthcare professionals with an interest in autism spectrum disorders.

Joseph Buxbaum, PhD, delivers keynote.

Joseph Buxbaum, PhD, Professor of Psychiatry from Mount Sinai School of Medicine, a world-renowned expert on the genetics of autism spectrum disorders, gave the keynote address, “Genes to Novel Therapeutics in Autism.” He explained that autism is a spectrum of disorders, and that genome-wide association studies and modeling suggest that 1000 genes may be involved in the development of the spectrum. Dr. Buxbaum presented findings that polymorphisms in the majority of these genes were common, but of low effect to increase the risk for autism. Some of his latest research on the genetics of autism indicates that genes related to synaptic function, chromatin remodeling, and transcription are the most common families of genes identified to be associated with autism spectrum disorders (ASD).

From L to R; back row: James McPartland, Dean Kenneth Kaushansky, Ramin Parsey, Joseph Buxbaum and Matthew Lerner. Front row: Howard Sirotkin, Ellen Li, Lorna Role, Patricia Whitaker-Azmitia, Kenneth Gadow, and Dennis Choi.

Guest expert, James McPartland, PhD, Associate Professor from Yale Child Study Center studies the social behavior aspects of ASD using electroencephalography (EEG). By recording event-related potentials from EEG after a social stimuli (a picture of a face), he identifies signature EEG changes associated with ASD. These signature changes are decreases in the speed and amplitude of N170 and P300 in ASD patients, and they are only seen for social, not non-social rewards. Also, using social behavior modification therapy on ASD patients can partially restore these deficits in EEG. Dr. McPartland's laboratory is working on developing a computer based application to provide social behavior modification therapy.

In addition, five other experts in the field of autism spectrum disorders from Stony Brook University also presented their research. Kenneth Gadow, PhD, Professor of Psychiatry, studies psychiatric ASD co-morbidities and what makes morbidities the same or different. He compared the incidence of various psychiatric disorders within ASD patients and showed a correlative increase in tics and schizophrenia. There was less of a correlation when comparing patients from the psychiatric clinic with ASD patients.

Ellen Li, MD, PhD, Professor of Medicine, studies the association of changes in the colon microbiome with ASD. She presented data indicating that ASD patients have a higher prevalence of functional gastrointestinal disorder — primarily constipation. However, using

the Simons Simplex collection of ASD patients and neurotypical siblings, her findings did not reflect any major differences in diversity or phyla present in the two groups.

Howard Sirotkin, PhD, Associate Professor Department of Neurobiology and Behavior at Stony Brook Medicine, spoke about using the zebrafish system to develop genetic models of ASD. Using zebrafish, he can test behavior using changes in neophobia and acoustic or visual startle; eventually social testing using schooling behavior will be possible. He has made knockout mutations in target genes including the fragile X mental retardation gene. FMR1 mutants are hyper responsive to startle and show reduced neophobia. He will next develop ASD mutant models of DYRK1a, shank3a, and CNTN4.

Matthew Lerner, PhD, Assistant Professor of Psychology, Psychiatry, and Pediatrics at Stony Brook University, spoke about the social dysfunction that is associated with ASD. He suggests that social knowledge is not what is lacking, but rather deficits in social performance and social skills are what need to be addressed. Dr. Lerner has also identified similar deficits in EEG markers for facial stimuli (N170), and a new EEG marker for vocal stimuli (N100). He guides ASD patients through social performance interventions using targeted activities, repeated practice, and social reinforcement to help them develop better social skills. He has also identified social creativity through improvisational games as a promising skill to develop.

Patricia Whitaker-Azmitia, Professor of Psychology and Psychiatry at Stony Brook University, spoke about using a rat model for ASD. The model is called developmental hyperserotonemia, and involves increasing serotonin levels in the mother and keeping them high in newborns. Increased levels of plasma serotonin are also seen in ASD patients. These animals show repeated and restricted behavior patterns with similarities to ASD behaviors. There is a glutamate/GABA activity mismatch in this model as well as increased neuroinflammation. There are also decreased levels of serotonin in the brain resulting from loss of serotonin neurons, with many dystrophic looking neurons, similar to those demonstrated in ASD.

Also included in the symposium was a poster presentation session on projects that relate to autism spectrum disorders. It was presented by Stony Brook University principal investigators or their graduate students, as well as members of the community.

The sixth annual “Meeting of the Minds” was introduced by Ken Kaushansky, Senior Vice President of Health Sciences at Stony Brook University; and Dennis Choi, MD, PhD, Director of the Neurosciences Institute and Chair of the Department of Neurology, Stony Brook Medicine. The morning session moderator was Lorna Role, PhD, Co-Director, Stony Brook University Neurosciences Institute, Professor and Chair, Department of Neurology & Behavior, Stony Brook Medicine. The afternoon session moderator was Ramin Parsey, MD, PhD, Co-Director, Stony Brook University Neurosciences Institute; Professor and Chair, Department of Psychiatry, Stony Brook Medicine.

The mission of the Meeting of the Minds is to assemble investigators, clinicians, and the public to increase collaborative investigations and trials, understanding, and support in the areas highlighted by the meeting.