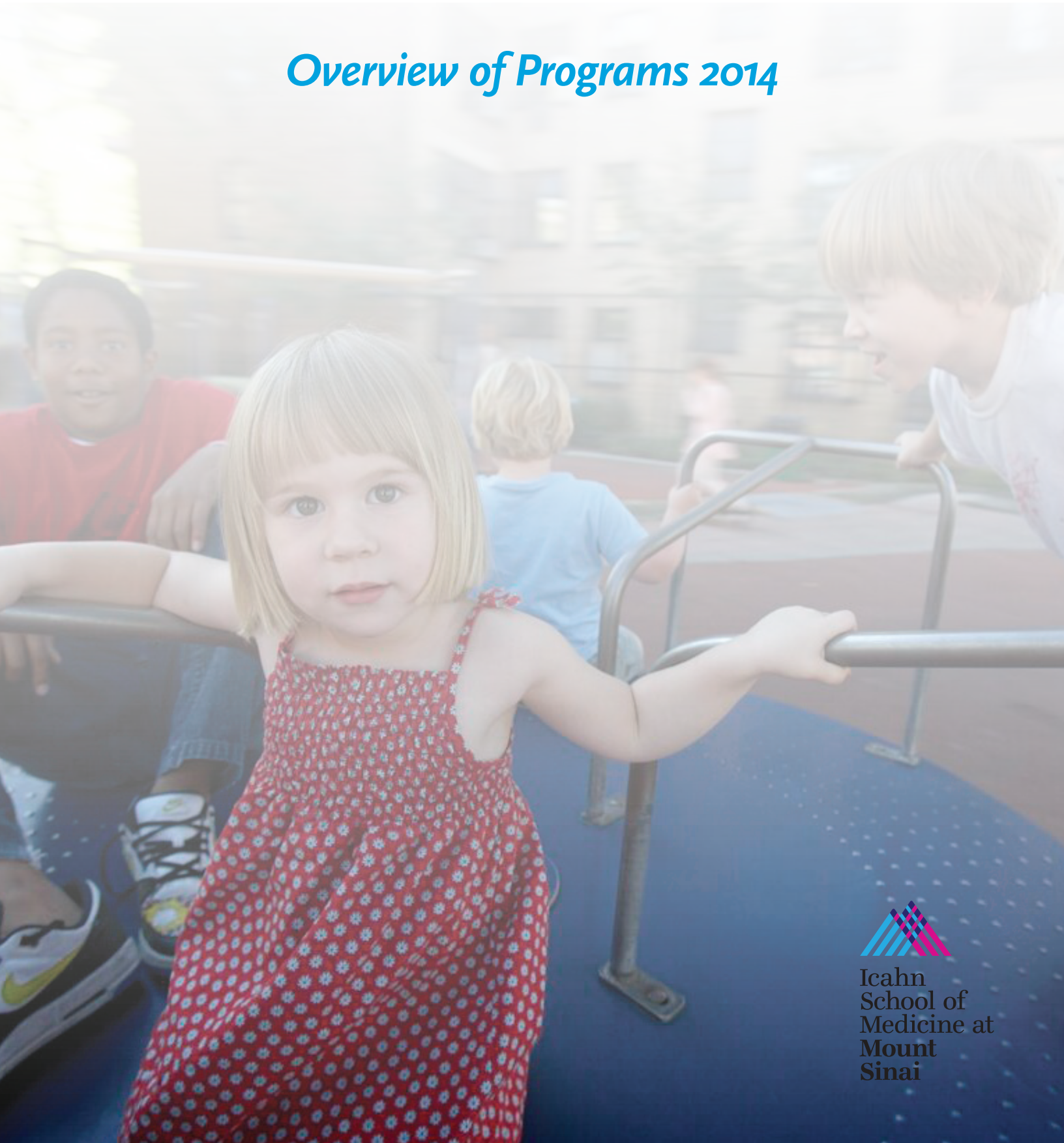




seaver autism center for research & treatment @ mount sinai

Overview of Programs 2014



Icahn
School of
Medicine at
Mount
Sinai

Mission Statement

The Seaver Autism Center for Research and Treatment is a fully integrated and translational center dedicated to discovering the biological causes of autism and developing breakthrough treatments. Our mission is to prevent and cure autism by bridging the gap between new discoveries at the basic science level and enhanced care, with the subsequent translation to the community of new and improved approaches to caring for people with autism.

Community Partnerships

The Association for Metroarea Autistic Children (AMAC)
FEGS Health and Human Services
Hebrew Educational Society
The Jewish Community Center (JCC) in Manhattan
Samuel Field / Bay Terrace Young Men and Young Women
Hebrew Association
United Jewish Appeal (UJA)-Federation of New York
Westchester Jewish Community Services (WJCS)
YAI Network
Young Men and Young Women Hebrew Association of
Washington Heights

Funding Agencies

Seaver Foundation
Autism Science Foundation
Simons Foundation
Autism Speaks
National Institutes of Health

The Seaver Autism Center for Research and Treatment was founded in 1993 through the generous support of the Beatrice and Samuel A. Seaver Foundation (Hirschell E. Levine and John D. Cohen, Co-Trustees).



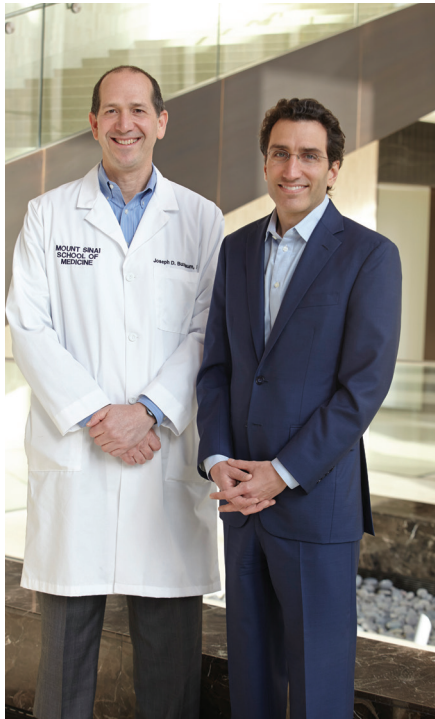
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Seaver Autism Center Leadership



JOSEPH D. BUXBAUM, PhD, DIRECTOR, AND
ALEX KOLEVZON, MD, CLINICAL DIRECTOR,
SEAVER AUTISM CENTER

Message from the Director

Since the founding of the Seaver Autism Center in 1993 by current Chief Executive Officer and President of the Mount Sinai Health System, Dr. Kenneth Davis, the Center has been dedicated to conducting progressive research studies while providing comprehensive, personalized care to children and adults with autism and autism spectrum disorders.

I have been on the faculty of the Seaver Center since 1997 and took over as Director in 2008, and over this time our depth and breadth of understanding of autism have grown exponentially, particularly around the genes and brain pathways that lead to autism. The field of autism research has exploded, and the field as a whole knows more than it ever has.

Of course with expanding knowledge comes more challenges. With our ongoing work with families and with research, we will address these challenges in order to continue to help those touched by autism. We will continue to identify the causes of autism and develop novel treatments. To ensure that research findings translate broadly into improved care for individuals with autism, we will continue to employ our training and outreach programs to bring these discoveries into the community. Please join us in this exciting time of autism research and treatment.

Message from the Clinical Director

I can distinctly recall my first experience with the autism spectrum as a camp counselor during college. I was introduced to Peter, one of my campers, who immediately began a long monologue about John F. Kennedy's assassination with details I had never heard and that were clearly garnered from the depth of history books. It was fascinating to me how this child could be so socially disabled but yet so motivated to engage.

Through additional experiences in college and later in medical school, I came to better understand the broad range of ability and disability across the autism spectrum. It was only after beginning residency training in psychiatry at Mount Sinai that I discovered the Seaver Autism Center and was encouraged to begin working with faculty there. The Chairman of the Department of Psychiatry at the time, Dr. Kenneth Davis, suggested to me that while clinical work with children and families was highly rewarding, clinical research could potentially impact whole populations of children and drive a field forward through new discoveries. With each passing year, my involvement with the Seaver Center developed, as did my understanding of the complexity of autism. As some questions get clarified, new ones emerge and we remain always optimistic in our search for answers.

Now 13 years later, I have grown up as a professional in the family that is the Seaver Autism Center. We have a wonderful team with complementary areas of expertise and interest. We work collaboratively on ongoing research questions, always under the steady support of the Seaver Foundation and the Center's Director, Dr. Joseph Buxbaum. We are eternally grateful to the families that make our research possible. With their help, we will continue this journey in the hope of developing new treatments with major effects on this oftentimes devastating disorder.



Research Program

Using state-of-the-art molecular genetic, neurobiological, and clinical approaches, we continue to make breakthroughs in multiple aspects of autism research. The interdisciplinary research platform of the Seaver Autism Center is supported by dedicated individuals from diverse backgrounds and includes biologists, physicians, neuroscientists, psychologists, research staff, and trainees in psychiatry, psychology, neuroscience, and medicine. Members of the research team participate in inter-related autism research programs in genetics, experimental therapeutics, and cognitive neuroscience; and researchers publish over 50 related articles per year in prestigious peer-reviewed journals.

Autism Model Systems Initiative

RODENT MODELS

Rodent models that carry a mutation in a known autism risk gene are important to improve the understanding of some of the causes of autism spectrum disorders (ASD) and test potential treatments. Although these models cannot reproduce all symptoms of the human disorder, there are a number of useful mouse and rat models which show phenotypic similarities to the human disorder and shed light on the affected mechanisms in the brain.

At the Seaver Autism Center, our experimental approaches include characterization of mouse and rat models carrying mutations in the Shank3 gene – one of the strongest genes for ASD – providing objective measures to basic biological effects of the Shank3 deletion on nerve cell connectivity, strength of the com-

munication between nerve cells, and cognitive, motor and social behavior. Using this system we discovered that treatment of Shank3-deficient mice with recombinant human Insulin-like Growth Factor-1 (IGF-1) reversed some synaptic and motor deficits, which has led to clinical trials of IGF-1 in SHANK3-deficient individuals and in ASD.

Our ongoing research on the characterization of additional mouse and rat models, developed here at Mount Sinai, has additional advantages, such as more complex and human-like neural circuitry and behavioral repertoire, which will help lead to a better understanding of the deficits in areas of the brain relevant to ASD and the development of new treatment approaches.

INDUCED PLURIPOTENT STEM CELLS

In coming years, stem cells will be a very important model system for ASD. First, this approach will allow us to study human nerve cell function in the context of autism genetic variation. Second, such cells can be used for gene discovery, using methods of systems genetics to look for disrupted molecular pathways for drug targets. Finally, these cells can form the basis for intermediate- and high-throughput small molecule screening for new ASD drugs.

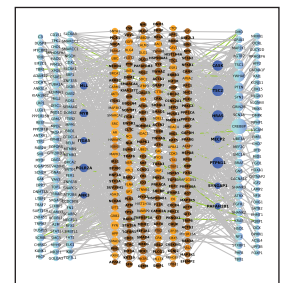
We are working with Mount Sinai's Black Stem Cell Institute, Friedman Brain Institute, and the Icahn Institute for Genomics and Multiscale Biology, as well as with outside institutions, to develop these three aspects of stem cell use in autism research.



SYSTEMS BIOLOGY

The Seaver Autism Center has been developing a new priority in the area of systems biology and systems genetics. The study of rare forms of ASD caused by mutation at a single locus is most valuable if it educates us about ASD more broadly. As more and more high-risk ASD genes are identified, making sense of the results can be done best by using integrated systems biology methods. Dr. Eric Schadt, Professor and Chair of Genetics and Genomic Sciences at Mount Sinai and Director of the Icahn Institute for Genomics and Multiscale Biology, is one of the world leaders in systems genetics, and we have partnered with him on these approaches in ASD research. These approaches can take advantage not only of genetic data, but also of gene expression data and protein-protein interaction databases.

We are also working with Dr. Pamela Sklar, Professor of Psychiatry, Neuroscience, and Genetic and Genomic Sciences and Chief of the Division of Psychiatric Genomics at Mount Sinai, on developing large-scale databases to support systems genetics research. We have co-founded a new consortium called the Common Mind Consortium, which is carrying out gene expression experiments in at least 800 human brain samples. The samples will include controls, schizophrenia cases, and autism cases, and will allow for the development of very robust gene networks for the human brain. The end goal is to make the data and analytical results broadly available to the public as a resource, while informing research on the causes and treatment of ASD.



PROTEIN NETWORK
DIAGRAM SHOWING A
STRONG RELATIONSHIP
BETWEEN THE FUNCTION
OF ASD GENES

Experimental Therapeutics

The Experimental Therapeutics Program at the Seaver Autism Center is focused on developing new treatments for ASD. Recent advances in genetic technology have allowed for the identification of causal genes in ASD, and our translational research strategy takes advantage of these genetic findings to develop animal models. These models allow us to understand the effects of genetic variants on brain function and to determine which molecular signaling pathways are affected in ASD. Once clarified, this information is used to discover specific targets for treatment development, first tested in the model systems, and then brought to clinical trials in affected children, adolescents, and adults.



INSULIN-LIKE GROWTH FACTOR-1

Following the translational approach, our group developed Shank3-deficient mice and discovered that glutamate receptor signaling and nerve cell processes that underlie learning and memory were impaired. IGF-1 was then administered and found to reverse the deficits in the mice. IGF-1 is an FDA-approved, commercially available compound that is known to promote the survival of nerve cell connections in addition to cell maturation and plasticity.

Importantly, IGF-1 is also effective in mouse models of Rett syndrome, suggesting that this pathway may be a target in diverse forms of ASD. Preliminary evidence in humans with Rett syndrome also suggests that IGF-1 is safe and effective. The Seaver Autism Center is conducting an important trial of IGF-1 in patients with SHANK3 deficiency. A new trial in patients with ASD but no SHANK3 deficiency will begin in January 2014.

ARBACLOFEN

The Seaver Center also participates in several multi-centered efforts to develop more targeted treatments in ASD sponsored by the pharmaceutical industry and foundations. A recent example of a translational treatment development approach is the large-scale clinical trial of arbaclofen in Fragile X syndrome (FXS) and in ASD. FXS accounts for approximately 1-2% of ASD cases. Detailed analysis of mouse and other models of FXS gave rise to a hypothesis that a specific glutamate receptor in nerve cell connections represents a potential target

in the disorder. Drugs that targeted this receptor were tried in mice and other model organisms that had mutations that mimic FXS. These drugs corrected some of the cellular and behavioral deficits observed in the mice and are now being studied in human trials. Arbaclofen is a selective GABA-B agonist that reduces glutamate signaling. Our group recently completed participation in a national network of sites sponsored by Seaside Therapeutics that collaborated to study its effect in ASD and FXS.

mGluR5 ANTAGONIST

Based on the glutamate hypothesis of FXS and its relevance to ASD more broadly, several other compounds are being studied to assess their effect on core symptom domains in ASD. One of these treatments, mGluR5, a specific glutamate receptor antagonist, is being studied in children, adolescents, and adults with FXS. The Seaver Autism Center is participating as a site in a multicenter clinical trial sponsored by Hoffmann La-Roche.

MEMANTINE

Memantine is another glutamate medication that we are studying in children and adolescents with ASD to assess its impact on language, attention, motor planning and memory. This study is sponsored by Autism Speaks and is being conducted in collaboration with Rush University and the University of Toronto.



SOCIAL SKILLS TREATMENT

Our Center has developed a cognitive-behavior therapy (CBT) based social skills treatment program — Seaver Nonverbal synchrony, Emotion recognition, and Theory of mind Training (S-NETT) — to improve social cognition in patients with ASD. The CBT curriculum, or S-NETT, targets three skill areas: non-verbal communication, emotion recognition, and perspective taking/theory of mind. In order to better understand the brain function underlying social cognition, we also use functional magnet-

ic resonance imaging (fMRI) to examine the effect of the CBT approach on brain activity during social tasks. Results indicate that the CBT approach leads to improved ability to recognize subtle emotional cues in facial expressions. Importantly, the CBT group also shows increased activation of brain regions that underlie social cognition after treatment. Future studies are being planned to explore the combined effect of CBT with psychopharmacologic intervention (e.g., oxytocin).

Major Research Studies

AUTISM SEQUENCING CONSORTIUM

Established in 2010 by Joseph Buxbaum, PhD, and Matthew State, MD, PhD (University of California at San Francisco), the Autism Sequencing Consortium (ASC) is an international group of scientists who share ASD samples, genetic data, and ideas in order to accelerate our understanding of the causes and treatments of ASD. All shared data and analysis is hosted here at Mount Sinai on a supercomputer called Minerva designed by Mount Sinai faculty. Arthur P. Goldberg, PhD, Seaver Faculty Fellow and computer scientist, has led the development of the new ASC Bioinformatics Hub. The Hub resides on Minerva and will be used

to analyze the sequence of 30,000 individuals for genes implicated in autism, using a new method by which every gene in the genome will be sequenced. The Hub will allow for joint analysis of data from multiple groups, and thus will increase the speed by which autism genes are discovered and novel therapeutics are developed. The ASC has recently received a \$7 million grant from the National Institutes of Health (NIH) to continue this important work.



STUDY OF OXYTOCIN IN ASD TO IMPROVE RECIPROCAL SOCIAL BEHAVIORS (SOARS-B)

Our Experimental Therapeutics Program has been highly invested in the development of oxytocin as a novel treatment in autism. A significant amount of evidence has accumulated over the past decade to indicate a possible role for oxytocin in improving social cognition and social behavior in ASD. Recently, an Autism Center of Excellence (ACE) Network grant was funded by the NIH. We will study 300 children and adolescents with ASD to assess the effect of treatment with intranasal oxytocin on recip-

rocal social behavior. Mount Sinai played a key role in organizing efforts around this proposal and will be one of five sites in the Network (with the University of North Carolina, University of Washington, Vanderbilt University, and Harvard University). Alex Kolevzon, MD, is the Principal Investigator for the Mount Sinai site. This study will be the first definitive treatment trial of oxytocin in ASD.

MULTIGENERATIONAL FAMILIAL AND ENVIRONMENTAL RISK FOR AUTISM (MINERVA)

Researchers in the MINERvA network—led by Abraham (Avi) Reichenberg, PhD, Seaver Faculty Fellow and Professor of Psychiatry and Preventive Medicine at Mount Sinai—are embarking on an ambitious attempt to understand how genetic and environmental factors influence the development of autism. Using detailed records on 5 million births from 7 countries (the United States, Australia, Denmark, Finland, Israel,

Norway, and Sweden), involving 20,000 cases of autism and biospecimens, the investigation will span three generations and involve grandparents, parents, aunts, uncles, and siblings and cousins. The goal is to demonstrate how risk for autism unfolds across generations and investigate pregnancy-related environmental factors in autism. Both MINERvA and SOARS-B are two of the 10 ACES funded by the NIH.

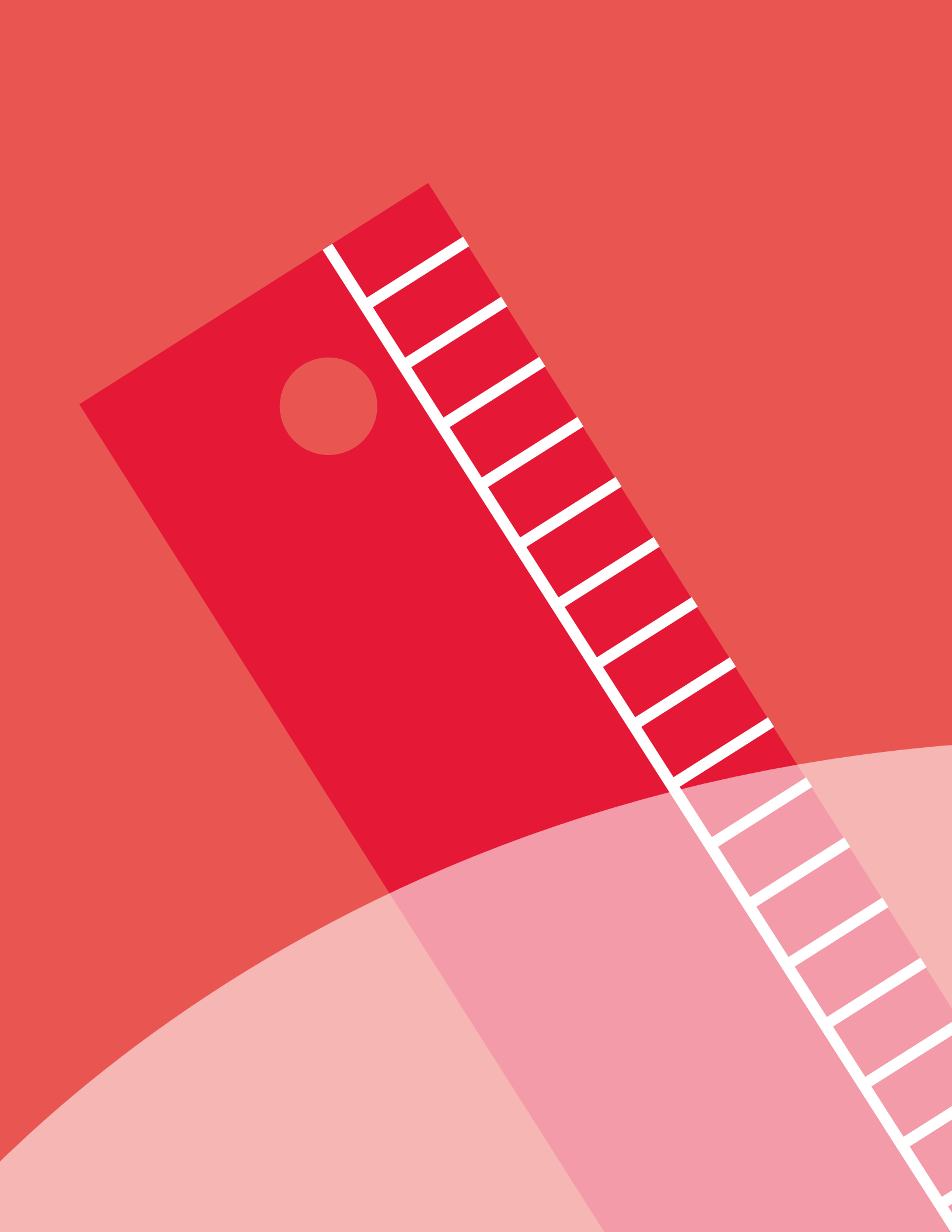


POPULATION-BASED AUTISM GENETICS AND ENVIRONMENT STUDY (PAGES)

While there has been great progress in understanding the risk architecture of autism, there are still unanswered questions about the nature of the genetic and non-genetic risk for autism. Many of these questions can be best addressed with a population-based epidemiological sample with detailed demographic and environmental information. Led by the Seaver Autism Center, the sites participating in this study (Karolinska Institute, Carnegie Mellon University, and the Broad Institute) will collect and biobank at least 1,300 cases with autism and 1,000 additional controls and develop an international resource for autism. All samples will be analyzed genetically using state-of-the-

art approaches. The researchers, headed by Joseph Buxbaum, PhD, will use novel methods to assess the role of both inherited and *de novo* (that which occur in the production of the egg or sperm) genetic variants in autism, while integrating key environmental variables. This new and substantively different approach to studying autism, compared to studies carried out in convenience samples, addresses many of the open questions in autism research and provides a path towards a better understanding of the genetic and environmental risk factors for autism and ultimately to better interventions in autism.

For information on the most current and up-to-date studies, please visit us on the web at www.seaverautismcenter.org/research/current-studies or call 212-241-0961.



Assessment and Clinical Programs

The Assessment Program at the Seaver Autism Center provides gold-standard diagnostic and psychosocial assessment, as well as the most up-to-date genetic evaluations for all patients participating in our research studies.

The Clinical Program is a comprehensive assessment and treatment program that provides the highest level of patient care informed by the outstanding clinical and basic science research conducted by the Seaver Center. The Clinical Program integrates a diverse research portfolio with state-of-the-art clinical care for the community.

Our clinical team consists of professionals from the disciplines of psychology, psychiatry, neurology, neuroscience, and pediatrics, all with specialized training in autism and related conditions. Each clinician has unique expertise working with children, adolescents, and adults, including those individuals with autism and related conditions who have complex needs and may be considered difficult to assess and treat. All of our clinicians are actively involved in both clinical and research activities of the Seaver Autism Center.



AVI REICHENBERG, PhD, (LEFT) AND JOSEPH D. BUXBAUM, PhD (RIGHT) WITH MEMBERS OF THE SEAVER CLINICAL FACULTY (L-R): MICHELLE GORENSTEIN-HOLTZMAN, PsyD, DANIELLE HALPERN, PsyD, ALEX KOLEVZON, MD, DAVID GRODBERG, MD, TING WANG, PhD, AND SHAWNA NEWMAN, MD

The Autism Clinical Program team includes the following distinguished faculty:

Cristina Farrell, MD, Developmental Pediatrician (not pictured)

Yitzchak Frank, MD, Pediatric Neurologist (not pictured)

Michelle Gorenstein-Holtzman, PsyD, Clinical Psychologist, Director of Community Outreach

David Grodberg, MD, Child and Adolescent Psychiatrist

Danielle Halpern, PsyD, Clinical Psychologist

Alex Kolevzon, MD, Child and Adolescent Psychiatrist, Clinical Director

Shawna Newman, MD, Assistant Clinical Professor of Psychiatry

Ting Wang, PhD, Assistant Professor of Psychiatry and Neuroscience

Comprehensive Assessment and Evaluation

Our clinicians provide state-of-the-art clinical assessments, among the best available in the world today. Their work also supports autism research across various programs at Mount Sinai, which has led to new ideas and innovative opportunities for collaboration.



DIAGNOSTIC TOOLS:

1. *Psychiatric Evaluations* using the Diagnostic and Statistical Manual for Mental Disorders;
2. *Neurological Examinations* to assess gross motor skills and gait, fine motor coordination, cranial nerves, and deep tendon reflexes;
3. *Autism Diagnostic Observation Schedule (ADOS)*, a direct semi-structured assessment that examines the presence of core symptoms of autism in the domains of social affect and repetitive, restricted behaviors;
4. *Autism Diagnostic Interview Revised (ADI-R)*, an investigator-based, semi-structured instrument used to differentiate autism spectrum disorder (ASD) from non-ASD developmental delay;
5. *Cognitive Testing* to provide estimates of cognitive functioning;
6. *Vineland Adaptive Behavior Scales-II*, to evaluate independence in daily life skills, including communication, socialization, and motor skills.

We also perform genetic testing, and clinical genetics evaluations are available and performed by clinical geneticists to assess growth, pubertal development, craniofacial features, organ malformations, and neurological abnormalities.

Psychological, behavioral, neuropsychological, and educational testing are also available as part of our Clinical Program.

Early Diagnosis

AUTISM MENTAL STATUS EXAM



DAVID GRODBERG, MD

In addition to the gold-standard battery of assessments provided by the Seaver Center, the Autism Mental Status Exam (AMSE), developed by Seaver investigator David Grodberg, MD, is included in each psychological evaluation. The AMSE is a brief diagnostic observational assessment tool that structures the way we observe and record social, communicative and behavioral functioning in people with ASD. A preliminary study recently published in the *Journal of Autism and Developmental Disorders* indicates that the AMSE has excellent inter-rater reliability and classification accuracy when compared to the ADOS in a high-risk population.

GENETIC TESTING

All families enrolled through the Assessment and Clinical Programs are offered a genetic evaluation to relate genetic results to other clinical research results. Our assessment clinicians work directly with clinical and molecular geneticists at Mount Sinai to conduct genetic analyses on all consenting families. We review medical records and perform chromosomal analyses including copy number variants by array comparative genomic hybridization, as well as targeted or whole exome genetic sequencing. This screen identifies etiological diagnosis in approximately 20 percent of families. Identifying the cause of autism in a given individual has very important ramifications for the families, as it provides opportunities for family counseling and better management, as well as furthers the goals of identifying new genes in autism and helps identify specific treatment targets for future patient-based research endeavors.



SEAVER AUTISM CENTER CLINICAL TEAM

Objective Measures Development



TERESA TAVASSOLI, PhD

SENSORY PROCESSING

Abnormal sensory reactivity is commonly reported in individuals with ASD, and the growing interest and role of sensory reactivity in ASD is reflected in the new changes in the Diagnostic and Statistical Manual of Mental Health Disorders, Fifth Edition (DSM-5) criteria. Under the direction of Teresa Tavassoli, PhD, Seaver Postdoctoral Fellow, our group has been validating methods to assess sensory reactivity using caregiver reports, as well as more objective sensory detection threshold tasks and arousal measures such as heart rate and skin conductance. Children are presented with different sensory stimuli, such as light touch by a feather, while heart rate and skin conductance are recorded. We expect that these physiological measures will be a useful objective assessment of sensory reactivity in addition to sensory caregiver reports and also intend to explore their potential as a biomarker in ASD treatment.

LANGUAGE ENVIRONMENT ANALYSIS

Traditional assessments of speech and language typically rely on parent report to evaluate developing skills. While these assessments provide useful information on the extent of delays, observational data on early language skills is critical for understanding this domain and developing sensitive outcome measurements for treatment research. Our group has been using an automated technology called Language Environment Analysis (LENA; www.lenafoundation.org) which uses a digital language processor and audio processing algorithms to measure the number of vocalizations produced in a child's natural environment as well as speech complexity and conversational turn counts. We are currently testing the feasibility of this technology to determine its utility for the objective assessment of language development in non-verbal children.

GAIT ANALYSIS

Motor deficits are an under-studied and potentially central feature of ASD. We have been collaborating with Elizabeth Torres, PhD, at the Rutgers Sensory Motor Integration Lab to pilot measures for the objective assessment of natural movement in developmentally delayed children, focusing on gait analysis. Dr. Torres uses three-dimensional (3D) motion capture systems to study movement differences in children with ASD and has found atypical patterns of motor variability. Children wear a 3D motion capture device with motion tracking sensors and we measure their gait among other motor activities, including simple shape or color matching tasks on a touch screen. We expect quantitative and objective measures of motor skills will be significant in future clinical trials intended to capture improvement in this domain.



TING WANG, PhD

NEUROIMAGING

Under the direction of Ting Wang, PhD, the Neuroimaging Program at the Seaver Autism Center uses multiple imaging techniques, including functional and structural magnetic resonance imaging (MRI) and Diffusion Tensor Imaging, to examine the neural architecture associated with autism. We integrate neuroimaging with treatment to examine whether and how brain activity changes with response to treatment. This approach allows us to probe for both neural predictors of and mechanisms underlying treatment response.

Treatment

The treatment services we provide include, but are not limited to:

1. Individual cognitive behavioral therapy
2. Medication management
3. Parent training
4. Sibling support groups
5. School consultation
6. Social skills groups



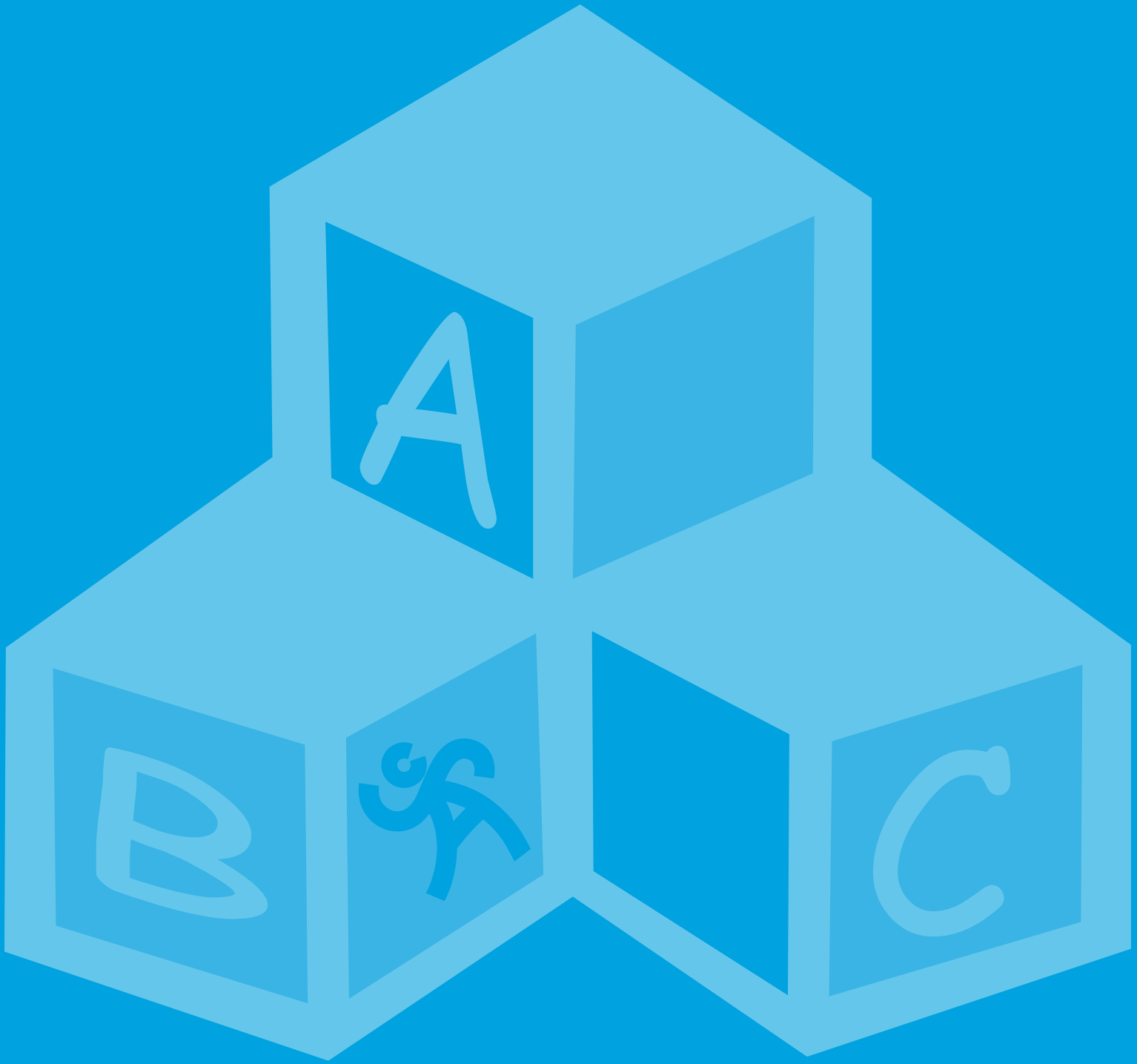
SOCIAL SKILLS PROGRAM

Under the direction of Michelle Gorenstein-Holtzman, PsyD, our clinical social skills program is a structured group that teaches social skills to children on the autism spectrum.

We utilize a cognitive behavioral model with visual supports and a positive reinforcement system. The curriculum we have developed has been implemented in many agencies throughout the tri-state area (including the Hebrew Educational Society, Y of Washington Heights, Samuel Field Y, Westchester Jewish Community Services, and the Jewish Community Center in Manhattan) and consists of several different lesson plans. The skills targeted are chosen based on the group's composition and the needs of the children. The curriculum covers topics such as conversation skills, emotion regulation, theory of mind, and nonverbal communication.

Groups meet weekly for 90 minutes and run for 12 weeks. In order to improve generalization of the skills taught in this program, at the end of each group a therapist meets with parents to discuss ways they can practice the skill with their child at home.





Training Program

Education and training remain an ongoing goal for the Seaver Autism Center. The multitude of training opportunities created by the Center span across all other programs, as well as other organizations within New York City.

Seaver Foundation Fellowships

The Seaver Foundation sponsors several fellowships each year. These research-based fellowships are awarded to graduate students, postdoctoral fellows, and junior faculty in such areas as genetic analysis, development of rodent models for autism spectrum disorders (ASD), neuroimaging studies, and develop-

ment and assessment of behavioral and pharmacological interventions.

In addition to Seaver Fellowships, Seaver trainees have received graduate and postdoctoral fellowships from Autism Speaks, Autism Science Foundation, Phelan-McDermid Syndrome Foundation, and Simons Foundation.



SEAVER GRADUATE, POSTDOCTORAL, AND FACULTY FELLOWS

Clinical Research Coordinator Program

The clinical research coordinators in the Seaver Autism Center play a critical role in supporting the mission of the Center to understand the causes of ASD and to develop novel therapeutics. Each coordinator is typically responsible for the implementation of several ongoing studies, including advertising and subject recruitment, scheduling, as well as data collection, entry, cleaning, and analysis. Once a family enrolls in a research study, the coordinator follows them throughout the duration of the protocol and oversees every element of their visits. Research coordinators also work closely with the Mount Sinai Program for the Protection of Human Subjects and the Grants and Contracts Office on new protocols and annual continuations.

In addition to their administrative and recruitment responsibilities, coordinators work closely with experienced research faculty in the Seaver Autism Center and have the opportunity to learn and administer cognitive tests and autism-specific diagnostic tools. Their important contribution is often reflected by co-authoring papers published in major medical journals. Most coordinators continue on to graduate school in psychology or medicine after completing their tenure at the Center. We have been very proud of the successes of our coordinators; many gain acceptance to the most prestigious graduate programs around the country with world-renowned autism researchers; several continue to work with us while in graduate school and beyond.

Community Fellowships

The Seaver Center provides fellowship training programs through formal affiliations with local community agencies, including FECS Health and Human Services (detailed in the Outreach Program section of this booklet) and the YAI Network. FECS is an organization that provides a variety of services to assist people with mental disabilities including autism, as well as people impacted by behavioral health and substance abuse challenges. YAI Network is a group of eight not-for-profit agencies serving individuals with developmental and learning disabilities and their families. Both the FECS/Seaver Fellows and the YAI/Seaver Fel-

lows receive training at the Seaver Center and have the opportunity to participate in various stages of ongoing studies. In turn, the fellows bring their training into the community by providing direct care to children and adults as well as developing new clinical service programs.



Medical Student Training

The Division of Child and Adolescent Psychiatry at the Icahn School of Medicine at Mount Sinai offers the Beatrix Hamburg Medical Student Training Fellowship in Child and Adolescent Psychiatry sponsored by the Klingenstein Third Generation Foundation (KTGF). The program provides significant clinical exposure, as well as teaching and mentorship opportunities for medical students at all levels of training. Students are exposed to rotations in different areas of Child and Adolescent Psychiatry, including the Seaver Autism Center, and they

are also provided with opportunities for summer research electives. Members of the Seaver Autism Center faculty serve as mentors and are paired with students. Students and mentors meet individually on a regular basis, and monthly dinner meetings are also held with the entire group to discuss clinical experiences, share ideas, and listen to invited guest speakers present on a variety of topics. This training program is also open to medical students outside of the KTGF program.



Residency Training

Residents in training in Child and Adolescent Psychiatry rotate in the Seaver Autism Center and spend time each week observing children undergoing comprehensive diagnostic evaluations and treatment. Trainees learn evidence-based methods of assessment and treatment in ASD and observe patients as they participate in treatment protocols, neuroimaging protocols,

and family/genetic studies in autism. By the end of the rotation, the trainee is expected to conduct a comprehensive initial evaluation of a child with ASD, identify the primary areas in need of psychiatric and psychosocial intervention, and discuss comprehensive treatment planning using the available options from the Seaver Center and ancillary agencies.

Psychology Training Program

The Seaver Center provides training opportunities for advanced psychology doctoral students interested in gaining research and clinical experience with children and adults with ASD. The Psychology Training Program offers psychology externs an opportunity to learn evidence-based methods of assessment and also learn social skills treatments and other interventions for children on the autism spectrum. Externs have the opportunity to learn

and administer research standard diagnostic instruments such as the Autism Diagnostic Interview and the Autism Diagnostic Observation Schedule. In addition to assisting with social skills therapy groups, externs have the opportunity to conduct baseline evaluations of cognitive and behavioral functioning, such as IQ and language testing, while developing mentored research projects.



Outreach Program

Community outreach is a major priority of the Seaver Autism Center. We are committed to educating patients, families, and the general public on the causes and treatments of autism spectrum disorders (ASD), and we frequently participate in educational programs to that end. We meet regularly with our constituents to evaluate our goals and priorities, as well as to get feedback on our programs and events.



“UNLOCKING THE MYSTERY OF AUTISM: FROM GENES TO NOVEL THERAPEUTICS”: AN EXPERT PANEL HOSTED BY THE SEAVER AUTISM CENTER. L-R: ALISON SINGER, MBA, PRESIDENT OF AUTISM SCIENCE FOUNDATION; JOSEPH BUXBAUM, PhD, DIRECTOR OF THE CENTER; ALEX KOLEVZON, MD, CLINICAL DIRECTOR OF THE CENTER; LATHA SOORYA, PhD, FORMER CHIEF PSYCHOLOGIST OF THE CENTER AND CURRENT ADJUNCT ASSISTANT PROFESSOR OF PSYCHIATRY

Michelle Gorenstein-Holtzman, PsyD, Clinical Psychologist and the Director of Community Outreach, has expanded the Center’s efforts to export our social skills curriculum to the community. Dr. Gorenstein-Holtzman is dedicated to building relationships with community programs and schools, and she plays a critical role in



MICHELLE GORENSTEIN-HOLTZMAN, PsyD

facilitating clinical referrals to community partners. Her work is supported in large part by a grant from the UJA-Federation.

Community Relationships

We have developed formal and informal relationships with schools, advocacy groups, and other community organizations to further our goals of educating the community, as well as improving care and advancing effective treatments for autism and related conditions.



YAI NETWORK

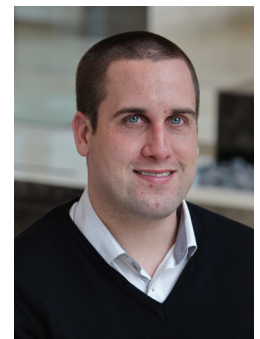
As part of the Seaver Autism Center affiliation with YAI — a service provider for 20,000 individuals with disabilities in the New York metropolitan region — the Center trains psychiatry fellows for YAI in diagnostic assessments and treatment protocols in an effort to

bridge the gap between research findings and clinical practice. In return, YAI actively recruits patients for the research protocols at the Seaver Autism Center. Both organizations run joint outreach and educational programs.

FEGS HEALTH AND HUMAN SERVICES

The Department of Psychiatry and the Seaver Autism Center have a formal affiliation with FEGS Health and Human Services System centered on a joint fellowship. FEGS, one of the nation's largest and most diversified health and human services organizations, brings together the best resources and people to help individuals achieve greater personal and economic independence. FEGS' network of compassionate and innovative programs in health/disabilities, home care, housing, employment/workforce, education, youth and family services, coordinate care and assistance to more than 10,000 people on some days, and over 100,000 people a year — inspiring individuals and families and strengthening communities. The fellowship

provides for the training of a psychology postdoctoral fellow in the translation of diagnosis, assessment, and intervention in ASD to FEGS services for adults. The affiliation also aims to further develop the partnership to support translational research endeavors in the areas of ASD and serious mental illness, particularly in the area of habilitation of functional impairments. During the course of the fellowship program, the psychology postdoctoral fellow has been responsible for establishing day habilitation classrooms for adults on the autism spectrum utilizing the Training and Education of Autistic and Related Communication Handicapped Children (TEACCH) model.

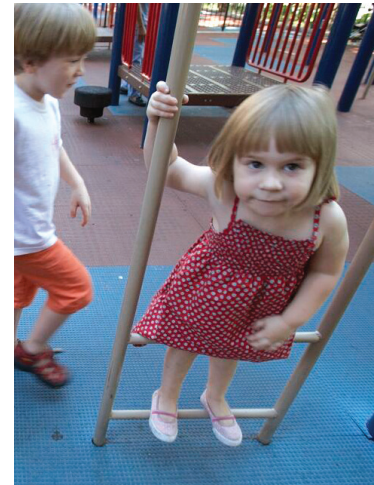


ADAM JOY, PSYD, THE CURRENT FEGS /SEAVER FELLOW

ASSOCIATION FOR METROAREA AUTISTIC CHILDREN

The collaboration between the Seaver Autism Center and the Association for Metroarea Autistic Children (AMAC), an Applied Behavioral Analysis school serving autistic children ages 2–21, has been longstanding. David Grodberg, MD, Assistant Professor at the Seaver Center, is the AMAC school psychiatrist, and Seaver Center staff provide consultation, lectures and seminars for the AMAC staff and families.

AMAC’s unique continuum of services, which span from early intervention and preschool to adult services, are research-based and reflect the high level of excellence to which both the Seaver Autism Center and AMAC are committed. AMAC continues to be an important community resource for the Seaver Autism Center’s clinical and research activities.



JEWISH BOARD OF FAMILY AND CHILDREN’S SERVICES

Michelle Gorenstein-Holtzman, PsyD, and Latha Soorya, PhD, current Adjunct Assistant Professor of Psychiatry at Mount Sinai and formerly the Seaver Center Chief Psychologist, developed a consultation program with the Jewish Board of Family and Children’s Services


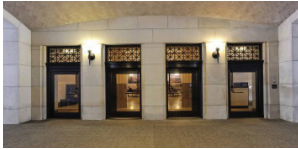
(JBFCS), a New York provider of social services and mental health programs. The Seaver Autism Center faculty has provided staff trainings related to research in ASD and are also consulting with JBFCS staff on the Center’s social skills curriculum.

AMERICAN MUSEUM OF NATURAL HISTORY

As part of the Seaver Autism Center’s ongoing effort to engage with the community and help children with ASD, Michelle Gorenstein-Holtzman, PsyD, and Danielle Halpern, PsyD, both Assistant Clinical Professors at the Seaver Center, have developed a specialized tour program for children with ASD at the American Museum of Natural History (AMNH).

once per month to accommodate these tours. This program is extremely exciting because it will provide a more comfortable, and therefore safer, environment, which will allow children on the autism spectrum to make the most of the museum and all it has to offer.

This groundbreaking program involves helping the museum develop a monthly autism program for children on the autism spectrum. The Seaver Center is educating museum volunteers about ASD and providing them with effective teaching techniques and behavioral strategies that they can use when conducting tours with children on the spectrum. To this end, staff from the Seaver Center developed materials (i.e., social stories, visual cues, prompt cards) that the museum will utilize for this program. These materials help the children by letting them know what they can expect on the tour and how to react if they feel anxious or uncomfortable. The AMNH will open one hour early

<p>Going to the American Museum of Natural History</p> <p>I am going with Billy to the American Museum of Natural History on September 15th.</p>  <p>When I go the Museum I will see a lot of interesting things. I will not be able to touch all of the things I see at the museum.</p> <p><small>Copyright © 2013 Mount Sinai School of Medicine</small></p>	<p>The American Museum of Natural History is located in Manhattan on 79th Street and Central Park West. When we get there we will walk down a driveway to get to the entrance.</p>  <p><small>Copyright © 2013 Mount Sinai School of Medicine</small></p>
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EXCERPT FROM THE AMNH SOCIAL STORY FOR 5-9 YEAR OLDS
DEVELOPED BY DRs. GORENSTEIN-HOLTZMAN AND HALPERN.®

Events and Communications

In recent years, the Seaver Autism Center has launched several new educational and outreach initiatives, including a quarterly Distinguished Lecturer Series and a monthly Seaver Seminar Series, as well as the community lecture series. The Center continues to develop its web presence and publish the quarterly newsletter designed for professionals, advocates, and families of people with autism. The Annual Advances in Autism Conference remains an important event in the field of autism research and treatment.

DISTINGUISHED LECTURER SERIES

In order to increase our efforts in educating both professionals and caregivers we have created a Distinguished Lecturer Series (DLS). The DLS is a two-day event that features a renowned ASD researcher from an outside institution. The speaker gives one presentation that is open to the public and geared towards

parents and families, and one presentation aimed at professionals. In addition to Dr. Tobias Boeckers (pictured at right with Dr. Buxbaum), we have also hosted Drs. Joseph Piven (University of North Carolina) and Daniel Geschwind (University of California at Los Angeles).



DR. TOBIAS M. BOECKERS, DIRECTOR OF THE INSTITUTE OF ANATOMY AND CELL BIOLOGY AT ULM UNIVERSITY WAS THE FIRST DISTINGUISHED LECTURER IN THIS SERIES.

SEAVER SEMINAR SERIES

The Seaver Seminar Series continues to be a central component of the education efforts at the Seaver Center and has been coordinated by Dr. Ting Wang since 2008. This series provides a forum for Mount Sinai and outside researchers to present current data on broad topics relevant to the advancement of autism research (e.g., epidemiology, genetics, and early detection). Recent speakers and presentation topics include:

- Dr. Kevin Pelphrey, “Searching for Neuroendophenotypes of Autism”
- Drs. John Foxe and Sophie Molheim, “Neurophysiology of Autism”
- Dr. Alison Lane, “Sensory Processing in Autism”
- Dr. Samuel Wang, “Developmental Sensitive Periods, the Cerebellum, and Autism”
- Dr. David Ledbetter, “A Genetics-First Approach to Autism Research and Treatment”
- Dr. Adriana DiMartino, “Examining Intrinsic Brain Function to Dissect Neurodevelopmental Disorders”
- Dr. Janine LaSalle “Mapping the Neuronal Methylome at the Epigenetic Interface of Genetic and Environmental Risk Factors”

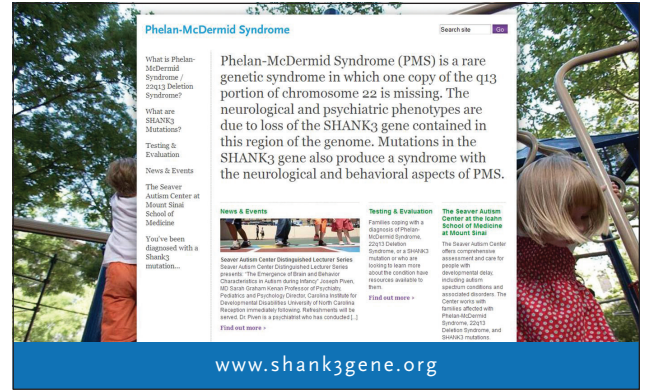
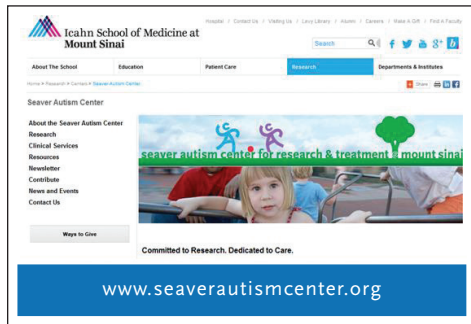
COMMUNITY LECTURE SERIES

In addition, we continue to expand our community lecture series to disseminate research findings to local groups. Presentations have included parent and school meetings held at the Jewish Community Center in Manhattan, United Jewish Appeal-Federation of New York (UJA), St. Luke's Psychiatry Residency Program, Manhattan Autism Charter School, the

New York City Nest program, and Sinergia. In 2012 we provided a monthly parent lecture series to community centers in Brooklyn through UJA's Brooklyn Autism Spectrum Disorders Initiative. This year we will continue to conduct parent lectures at community centers in Brooklyn on a quarterly basis.

COMMUNICATIONS

Seaver on the Web



Quarterly Newsletter

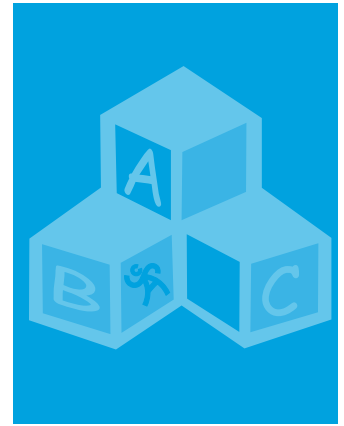
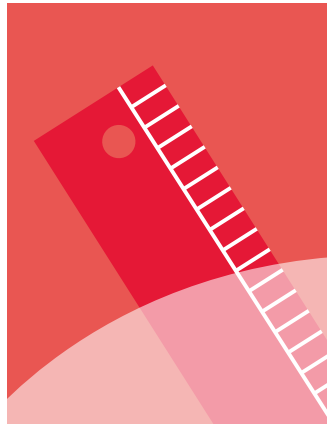


Annual Advances in Autism Conference

Since 1997, the Seaver Autism Center Annual Advances in Autism Conference has been bringing together academic, parent, and community groups to participate in thoughtful and informative presentations. The event is a series of lectures and workshops given by accomplished professionals in the field of autism, and the purpose is to advance knowledge of practicing health care professionals, educators, family members and social workers as to the accurate recognition, diagnosis, and treatment of autism spectrum disorders. The conference community continues to grow, and participants look forward to attending each year.







Our research is directed by the need to provide better care and service for families affected by autism spectrum disorders. Our commitment to research is driven by our compassion and dedication to patient care, as well as to advance the field of autism research. The Seaver Autism Center is a major player in this field at every stage, from laboratory and clinical research, to training and outreach in the community. Because of this, the Center is at the forefront of translating research findings into improved community care. Moving forward, we will continue to identify the causes of autism and advance effective treatments in order to improve the lives of families affected by autism spectrum disorders.

If you would like to learn more or contribute to research being conducted at the Seaver Autism Center, please visit us online at www.seaverautismcenter.org.



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Seaver Autism Center for Research and Treatment, One Gustave L. Levy Place, Box 1230
New York, NY 10029-6574 theseavercenter@mssm.edu 212-241-0961