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Autism Center Balances Commitment to Clinical Care For All Ages and Advanced Research

Rooms at NewYork-Presbyterian Hospital's Center for Autism and the Developing Brain were designed as flexible spaces that will allow the Center to provide multimodal treatment to patients diagnosed with autism spectrum disorders (ASDs) and other developmental disorders of the brain. The Center—opening in spring 2013—will provide services for patients throughout their lives, and also will work to further research into ASDs.

The Center is a collaboration among NewYork-Presbyterian Hospital, Weill Cornell Medical College, and Columbia University College of Physicians and Surgeons, in partnership with New York Collaborates for Autism, and is located about 25 miles from Manhattan on the Hospital's 214-acre Westchester Division campus in White Plains, New York. The Center aims to translate cutting-edge research into clinical care and educate families and school staff about ASDs and related disorders. The multidisciplinary team includes psychologists, psychiatrists, social workers, speech and language therapists, and behavioral therapists, among others.

Catherine Lord, PhD, attending psychologist at NewYork-Presbyterian/Weill Cornell, and Professor of Psychology in Psychiatry and a DeWitt Wallace Senior Scholar at Weill Cornell Medical College, will lead these experts as Director of the Center for Autism and the Developing Brain.

“What is different about our Center is that we are very focused on providing the highest quality clinical services that we can in the context of being part of a major research institution,” said Dr. Lord. “There are a number of big autism centers that have numerous, very high-powered faculty in basic sciences and clinical sciences, but our primary focus is on how to provide the best clinical



Computer rendition of flexible space in the Center for Autism and the Developing Brain.

care. We will affiliate within our own institutions, Weill Cornell and Columbia, and with nearby and distant autism programs from NYU to UCLA and UC Davis, to do neurobiologic and large-scale intervention studies, but the core of our Center is small and focused on clinical care.”

The care of patients with ASDs has been the focus of Dr. Lord's career since participating in undergraduate investigations into the effectiveness of a behavioral intervention meant to help socialize children with autism. Later, Dr. Lord codeveloped renowned screening tools, such as the Autism Diagnostic Observation Schedule, designed to aid clinicians in recognizing autism in patients of varying ages, and participated in numerous studies on treatments for autism that involve peer-, family-, and school-based interventions. At the Center, Dr. Lord believes this range of experience will allow her to guide clinicians toward the best treatment for each patient, rather than employing a standard, specified treatment regardless of patient and family needs.

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Dr. Jeffrey Lieberman Elected APA President

Jeffrey A. Lieberman, MD, Psychiatrist-in-Chief at NewYork-Presbyterian Hospital/Columbia University Medical Center and the Lawrence C. Kolb Professor and Chairman of Psychiatry at Columbia University College of Physicians and Surgeons, has been elected the next President of the American Psychiatric Association (APA). Dr. Lieberman, who is also Director of the New York State Psychiatric Institute, will begin his term as APA President in May 2013.

Genetics Research Across Medical Specialties Now Yielding Secrets and Fueling Progress

The decoding of the human genome and subsequent concerted efforts by physician-scientists to decipher the relationships between specific genes and the diseases they influence have already yielded tremendous advancements in medicine. This work is fostering important strides in understanding and caring for people with diseases affecting all health systems, and much of the laboratory and translational studies, as well as clinical research, are being done at Columbia University College of Physicians and Surgeons, Weill Cornell Medical College, and NewYork-Presbyterian Hospital.

Research abounds in every field. The field of geriatrics, for instance, was intrigued by a study led by Columbia University researcher Lawrence S. Honig, MD, PhD, Professor of Clinical Neurology in the Taub Institute, an Alzheimer's disease research center funded by the National Institute on Aging.¹ Dr. Honig's research found that telomere length relates both to the likelihood of the patient developing dementia and his or her overall remaining life span. This research could lead to the use of telomere length as an accurate biomarker of aging in people, as well as an early warning sign for future dementia.

The researchers examined telomere lengths from DNA samples of white blood cells obtained from 1,983 individuals aged 66 to 101 years. These patients were followed for an average of 8 years. After adjusting for age and education, among other factors, researchers found that those individuals with shorter telomeres had higher rates of both dementia and mortality. The researchers must now examine whether shorter telomeres directly increase the risk for dementia and death, or if the telomeres are being influenced by some other factor that is both shortening telomere length while at the same time increasing dementia and mortality risk.

Within psychiatry, schizophrenia has long been known to be genetic in origin, but the networks of genes involved in this disability have not been well characterized. A recent paper published in *Nature Neuroscience* found a link between schizophrenia and autism.² Columbia researchers examined a collection of mutations associated with schizophrenia and found

occult interrelations among genes that had previously been thought to be unrelated. The researchers found that most of the mutated schizophrenia genes were related to 2 main gene networks, which together affect key processes, including axon guidance, synapse function, neuron mobility, and chromosomal modification.

Noting that the genetic networks for autism and schizophrenia are closely intertwined, the researchers postulated that many other psychiatric disorders also might share the same genetic networks and interrelated molecular processes.

The research, which was led by Dennis Vitkup, PhD, Associate Professor in the Department of Biomedical Informatics at Columbia's Center for Computational Biology and Bioinformatics, also looked at genes mutated in patients with autism and found the similarities were surprisingly robust. Noting that the genetic networks for autism and schizophrenia are closely intertwined, the researchers postulated that many other psychiatric disorders also might share the same genetic networks and interrelated molecular processes.

Significant research on the genetics behind psychological illness is being undertaken at Weill Cornell Medical College. As just one example, Francis S.Y. Lee, MD, PhD, Professor and Vice Chair for Research in the Department of Psychiatry and Professor in the Department of Pharmacology, who is also an Attending Psychiatrist at the Hospital, directs efforts focused on using genetic models to define the role of growth factors, such

as brain-derived neurotrophic factor, and their affect on the pathophysiology and treatment of affective disorders.³

Pulmonology has begun to explore the use of gene-based vaccines targeted against pulmonary infectious organisms. At Weill Cornell Medical College, a team led by Stefan Worgall, MD, PhD, Division Chief of the Pediatrics Pulmonology, Allergy and Immunology Division, has developed capsid-modified adenovirus vectors^{4,5} to heighten immune responses from genetic vaccines against both *Pseudomonas aeruginosa* and respiratory syncytial virus. In research on the pathogenesis of cystic

fibrosis, Dr. Worgall is investigating the interaction of alveolar macrophages with *P. aeruginosa*.

Nephrologists and psychiatrists, meanwhile, were interested in the results of a large multinational study in which Columbia University played an important role.⁶ The study, led by Ali Gharavi, MD, Associate Director of the Division of Nephrology at NewYork-Presbyterian/Columbia, is the first to link congenital kidney disease, which together with urinary tract defects accounts for about one-fourth of all birth defects in the United States, with neurodevelopmental disorders. The study found that 10% of children born with kidney defects have genomic alterations that have been linked with neurodevelopmental delay and mental illness. The finding is important because it paves the way for identifying subgroups of patients with kidney defects whose treatment will be guided by

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“Our goal is to have many different types of evidence-based treatments, and to try to match the treatment to the child and the family. Also, we want to give people a sense of how they can choose treatment providers in the community and make decisions about where to go if a treatment is or isn’t working,” Dr. Lord said. “Many agencies tend to do one treatment, and that treatment is what they are known for. We want to match the treatment to the child, and know empirically how we can do that job better.”

New and innovative methods for treatment are crucial. According to the US Centers for Disease Control and Prevention, an estimated 1 million to 1.5 million adults and children in the United States live with an ASD. Dr. Lord and her team currently are involved in 2 clinical trials investigating novel approaches to working with families and schools to gauge the balance between medication and behavioral interventions in patients of varying ages. For children, parental and familial involvement will be key at the Center to carry out chosen interventions in the home environment and provide behavioral and observational reports. In turn, by working closely with families, Center personnel will have the opportunity to measure outcomes from chosen interventions more precisely—even short-term changes in spontaneous behavior—thus influencing research into the application of various treatment options.

Housed in an almost 8,000-square-foot converted gymnasium, the Center will begin operations with a full-time staff of approximately 12 clinicians, which will expand with regularly scheduled subspecialty clinics in fields such as pediatric neurology, sleep medicine, gastroenterology, and genetics, according to Dr. Lord. She added that accepting insurance and Medicaid is another way of reaching out to parents and families to ensure clinicians have the opportunity to correctly diagnose and treat children who may have autism or related disorders. “Parents are good at describing how their children behave, but they’re not



The Center for Autism and the Developing Brain.

necessarily good at putting that behavior into a context of how usual or unusual it is,” Dr. Lord said.

Further necessitating the importance of accurate patient diagnosis will be changes made to how autism and related conditions—such as Asperger’s syndrome and pervasive developmental disorder, not otherwise specified—are categorized in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*, due to be published in 2013. Most importantly, the guidelines—recently formally approved—place autism and related conditions under one umbrella category: autism spectrum disorders. Dr. Lord is a member of the American Psychiatric Association’s *DSM-5* Neurodevelopmental Disorders Work Group and has participated in studies evaluating the differences in autism diagnosis between the fourth and fifth editions.

“The goal is to be clear for professionals making diagnoses as to what characteristics they are looking for in patients with autism as well as to be broad when describing behavioral examples so that they could apply to a small child all the way up to a very bright adult,” Dr. Lord said. “We’re also trying to encourage psychiatrists and other professionals to be specific about other aspects of skills, like

language level, nonverbal problem solving, and attention-deficit/hyperactivity, etc. We’re trying to be clearer so that not everybody who has some kind of social awkwardness is diagnosed with ASD. That’s been quite a juggling act.”

Dr. Lord acknowledged that her work on the *DSM-5* has provoked some controversy, but added that a recent analysis found that the proposed *DSM-5* criteria would not significantly change the numbers of children diagnosed with ASDs, and that follow-up between parents and clinicians will decrease differences in diagnosis still further.

Once patients are diagnosed, Dr. Lord said the Center not only will be a resource for them, their parents, families, and community, but also for researchers hoping to gain detailed, careful documentation about the disorder, its diagnosis, and the context of patients’ lives. This close connection with the patient’s network is designed both to understand the benefit of treatment interventions and to provide an additional avenue of support to the patient. “We don’t see ourselves as replacing existing community resources,” she said. “We’re trying to provide specific services, and then work with agencies closer to home to make sure that children and adults get the best care.”



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ADVANCES IN PSYCHIATRY

Important news from NewYork-Presbyterian Psychiatry.

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specific genetic information. The finding also alerts physicians who care for children with congenital kidney disorders that there may be a genetic basis for a neurodevelopmental delay or a mental illness that will occur later in life.

A co-author of this study was Wendy Chung, MD, PhD, Director of Clinical Genetics at NewYork-Presbyterian Morgan Stanley Children's Hospital. Her research interests span multiple areas, including the molecular genetics of obesity and diabetes; congenital heart disease; the genetic foundations of cardiomyopathies, arrhythmias, long QT syndrome, and pulmonary hypertension; congenital diaphragmatic hernias; mental retardation; inherited metabolic conditions; and susceptibility to breast and pancreatic cancers. She is Director of the Pediatric Heart Network Genetic Core, the Pediatric Neuromuscular Network Molecular Core, the New York Obesity Center Molecular Genetics Core, and the Diabetes and Endocrine Research Center Molecular Genetics Core. She also serves as Director of the Clinical Cancer Genetics Program and the Fellowship Program in Cytogenetics and Molecular Genetics.

Perhaps no area of medicine has been as affected by research into the genetic

foundations of disease as much as oncology. Examples of genetic discoveries in oncology are plentiful. An important recent discovery is the revelation that certain cases of glioblastoma are caused by the fusion of 2 genes.⁷ Researchers, led by Antonio Iavarone, MD, Professor of Pathology and Neurology at Columbia's Herbert Irving Comprehensive Cancer Center at NewYork-Presbyterian/Columbia, conducted genetic analyses of patients with glioblastomas, searching for evidence of gene fusions. They found them, with the most common being fusions involving the fibroblast growth factor receptor (*FGFR1* or *FGFR3*) and transforming acidic coiled-coil (*TACCI* or *TACC3*) genes. The protein produced by the fusion of *FGFR-TACC* disrupts the mitotic spindle, causing aneuploidy, and from there tumorigenesis. The finding is important because it provides researchers with a protein target for pharmaceutical research for a cancer that is especially difficult to treat.

The field of clinical genetics is rapidly changing and improving the practice of medicine. As the field of genetics continues to grow so too the physician-scientists at Columbia University College of Physicians and Surgeons, Weill Cornell Medical College, and NewYork-Presbyterian

Hospital will continue to be at the forefront of integrating genetics into all specialties.

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