



Inside the Institute
Newsletter for the Carolina Institute for Developmental Disabilities

Issue # 19
April 2016

April is National Autism Awareness Month!

SPARK

Igniting autism research
Improving lives



**UNC Joins Launch of SPARK,
Nation's Largest Autism Research Study**

Groundbreaking initiative combines web-based registry with DNA analysis to accelerate autism research and speed discovery of treatments, supports.

Thursday, April 21, 2016, the Carolina Institute for Developmental Disabilities at the University of North Carolina-Chapel Hill helped launch SPARK, an online research initiative designed to become the largest autism study ever undertaken in the United States. Sponsored by the Simons Foundation Autism Research Initiative (SFARI), SPARK will collect information and DNA for genetic analysis from 50,000 individuals with autism — and their families — to advance our understanding of the causes of this condition and to hasten the discovery of supports and treatments.

UNC is one of a select group of 21 leading national research institutions chosen by SFARI to assist with recruitment. The SPARK effort is being led locally by Dr. Joseph Piven, Thomas E. Castelloe Distinguished Professor of Psychiatry, Pediatrics and Psychology and Director of the Carolina Institute for Developmental Disabilities, and Dr. Gabriel Dichter, Associate Professor of Psychiatry and Psychology & Neuroscience and their team at UNC.

"SPARK empowers researchers to make new discoveries that will ultimately lead to the development of new supports and treatments to improve lives, which makes it one of the most insightful research endeavors to date, in addition to being the largest genetic research initiative in the U.S.," says Dr. Dichter. "UNC is known for our research in autism, so we are incredibly excited to be a part of SPARK, the largest genetic autism study now underway in the U.S."

Autism is known to have a strong genetic component. To date, approximately 50 genes have been identified that almost certainly play a role in autism, and scientists estimate that an additional 300 or more are involved. By studying these genes, associated biological mechanisms and how genetics interact with environmental factors, researchers can better understand the condition's causes, and link them to the spectrum of symptoms, skills and challenges of those affected.

SPARK aims to speed up autism research by inviting participation from this large, diverse autism community, with the goal of including individuals with a professional diagnosis of autism of both sexes and all ages, backgrounds, races, geographic locations and socioeconomic situations.

SPARK will connect participants to researchers, offering them the unique opportunity to impact the future of autism research by joining any of the multiple studies offered through SPARK. The initiative will catalyze research by creating large-scale access to study participants whose DNA may be selectively analyzed for a specific scientific question of interest. SPARK will also elicit feedback from individuals and parents of children with autism to develop a robust research agenda that is meaningful for them.

Anyone interested in learning more about SPARK or in participating can visit www.sparkforautism.org/unc, or contact us by phone 919-966-6795 or email sparkforautism@unc.edu.

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NEW RESOURCE FOR FAMILIES AND PROVIDERS: NC Act Early website (www.ncactearly.com)

North Carolina Act Early



Monitoring and tracking children's developmental milestones gives us the chance to catch early signs of an autism spectrum disorder or other developmental concern. The NC Act Early website is closely tied to the CDC's "Learn the Signs. Act Early." (LTSAE) program which aims to improve early identification of children with autism and other developmental disabilities so children and families can get the services and support they need as early as possible. Through the website, you can access free LTSAE materials such as milestone checklists and fact sheets and find information about specific NC resources for children 0-5.

The NC Act Early website was developed by Becky Pretzel, PhD, CIDD Associate Director, and Laura Hiruma, PhD, Postdoctoral Fellow in Clinical Psychology. Funding and support was provided by the CDC Act Early Ambassador program; additional support was provided by the NC ASD State Implementation grant and the NC Autism Alliance.

Please share the link and add it to your list of resources!

www.ncactearly.com

Red Flags for Autism Spectrum Disorder (ASD) in Young Children

The following warning signs are associated with risk for developmental disabilities, such as autism spectrum disorder (ASD), in young children. If your child exhibits any of the warning signs below, talk to your pediatrician or local [Children's Developmental Services Agency \(CDSA\)](#) to get your child evaluated. For more information on how to talk to your child's doctor about developmental concerns, review the CDC's [Concerned About Development? How to Talk with the Doctor](#) worksheet.

Developmental Red Flags

- Does not babble or coo by 10 months of age
- Does not use gestures, such as pointing, waving, or reaching by 12 months of age
- Does not use words by 15 months (for girls) or 18 months (for boys)
- Does not follow simple directions by 24 months of age
- Does not use two-word phrases by 2 years of age **and** there are other concerns about his/her comprehension, speech, or use of gestures
- Does not point to show things or look at objects when another person points
- Has language or play skills below those of his/her same-aged peers
- Difficulty engaging with others during social interactions and preference for being alone
- Avoidance of eye contact or touch
- Repeating or echoing of words or phrases in place of spontaneous language
- Difficulty engaging in pretend play
- Repetitive hand or body movements
- Insistence on specific rituals or routines and difficulty adapting to changes in routine
- Overly intense or unusual interests, which may include interest in parts of objects
- Unusual reactions to specific smells, tastes, textures, visuals, or sounds
- Loss of language or social skills
- If a child has a sibling with ASD, he/she may be at higher risk for developing ASD



UNC Autism Article Named One of Top 10 Papers of 2015



Autism Speaks, a leading international autism science and advocacy organization, tabbed a joint research paper by University of North Carolina and University of Western Australia autism experts as one 2015's top 10 scientific papers related to autism. The paper, published last fall in the *Journal of Neurodevelopmental Disorders*, identified for the first time the high rate of Parkinson's disease in older autism patients. Joseph Piven, MD, the Thomas E. Castleoe Distinguished Professor of Psychiatry, Pediatrics, and Psychology at the UNC School of Medicine and director of the Carolina Institute Developmental Disabilities (CIDD), was the senior author.

"We wanted to study older people with autism because so little is known about them and their needs as they age," Piven said. "We found that a substantial number of adults over age 39 had Parkinson's disease. This has serious implications for understanding the neurobiology of the disorder and treatment in older adults, especially in light of the prevalence of autism in school-age children." Parkinson's is a neurodegenerative disorder characterized by symptoms, such as tremors, body rigidity, imbalance, and slowness of movement. Paul Wang, Autism Speaks head of medical research, said, "This study emphasizes what Autism Speaks has long advocated: our adult community needs more resources and more specialized services to address potential autism-related complications such as Parkinson's, and psychiatric issues such as anxiety and depression." The full top 10 list can be [found here](#).

The paper's importance to the field further illustrates UNC's place in the autism research community. According to a 2010 Interagency Autism Coordinating Committee report – the most recent assessment of its kind – UNC was ranked second worldwide in the number of peer-reviewed autism papers. In 2013, [UNC research on the genetics of autism](#) made the top 10 list of breakthroughs that "most powerfully advance our understanding and treatment of autism," according to Autism Speaks.

The 2015 paper, "[High Rates of Parkinsonism in Adults with Autism](#)," was a collaboration with Sergio Starkstein, MD, PhD, at the University of Western Australia. UNC co-authors include Morgan Parlier, MSW, a clinical social work faculty member at the CIDD, and Leslie Payne, MSW, a former graduate student at the CIDD. In this paper, the researchers show data from two independent studies from two different countries. They found that four of the 20 participants who were not taking atypical neuroleptic drugs were diagnosed with Parkinson's disease. This 20 percent rate of diagnosis was 200 fold higher than the normal rate of incidence – one in 1000 or 0.1 percent – among the general population of people age 45-65. There was an even higher rate of Parkinson's among participants taking neuroleptic drugs, which can cause Parkinson's symptoms. Piven said these were small studies and need to be replicated in a larger pool of people with autism. "But we think these findings are the tip of the iceberg," he said. "Studying older populations of people with autism is a new frontier, and we think this continued work will uncover very important information clinicians and patients need for us to better care for people with autism as they age."



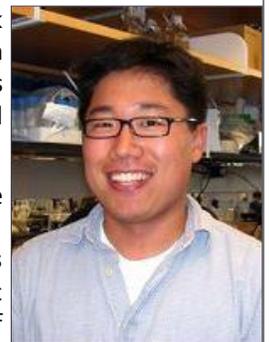
Jason Yi Receives SFARI Bridge to Independence Award

Congratulations to Jason Yi, PhD, postdoctoral fellow in the laboratory of Mark Zylka, PhD, and a former post doc in the CIDD NIH T32 Post doctoral Research Training Program, who was selected as one of six finalists for the Simons Foundation Autism Research Initiative (SFARI) Bridge to Independence Award competition for his proposed research project, "Inhibitory circuit dysfunction in autism spectrum disorder."

Duplication or triplication of UBE3A is known to be linked to autism. Moreover, an autism-linked missense mutation in UBE3A has recently been found to result in excessive UBE3A activity and synaptic dysfunction. Yi's research project aims to generate and characterize a mouse model of autism that incorporates this disease-linked mutation. Subsequent experiments will focus on investigating how changes in synaptogenic programs alter patterns of interneuron migration and the functional and behavioral consequences of aberrant interneuron development in this mouse model.

Grants awarded through the Bridge to Independence Award program are activated upon starting a faculty position and are intended to invest in the next generation of top autism investigators by helping early-career scientists transition from mentored training positions to independent research careers.

The award results in a commitment of \$450,000 over three years.



Could a New Class of Fungicides Play a Role in Autism, Neurodegenerative Diseases?

A new UNC School of Medicine study shows how chemicals designed to protect crops can cause gene expression changes in mouse brain cells that look strikingly similar to changes in the brains of people with autism and Alzheimer's disease.



Mark Zylka, PhD

Scientists at the UNC School of Medicine have found a class of commonly used fungicides that produce gene expression changes similar to those in people with autism and neurodegenerative conditions, including Alzheimer's disease and Huntington's disease. The study, published in the journal *Nature Communications*, describes a new way to home in on chemicals that have the potential to affect brain functions.

Mark Zylka, PhD, senior author of the study and associate professor of cell biology and physiology at UNC, and his team exposed mouse neurons to approximately 300 different chemicals. Then the researchers sequenced RNA from these neurons to find out which genes were misregulated when compared to untreated neurons. This work created hundreds of data sets of gene expression; genes give rise to products, including proteins or RNA.

Zylka's team then used computer programs to deduce which chemicals caused gene expression changes that were similar to each other. "Based on RNA sequencing, we describe six groups of chemicals," Zylka said. "We found that chemicals within each group altered expression in a common manner. One of these groups of chemicals altered the levels of many of the same genes that are altered in the brains of people with autism or Alzheimer's disease."

Chemicals in this group included the pesticides rotenone, pyridaben, and fenpyroximate, and a new class of fungicides that includes pyraclostrobin, trifloxystrobin, fenamidone, and famoxadone. Azoxystrobin, fluoxastrobin, and kresoxim-methyl are also in this fungicide class. "We cannot say that these chemicals *cause* these conditions in people," Zylka cautioned. "Many additional studies will be needed to determine if any of these chemicals represent real risks to the human brain."

Zylka, a member of the Carolina Institute for Developmental Disabilities and UNC Neuroscience Center, and his group found that these chemicals reduced the expression of genes involved in synaptic transmission – the connections important for communication between neurons. If these genes are not expressed properly, then our brains cannot function normally. Also, these chemicals caused an elevated expression of genes associated with inflammation in the nervous system. This so-called neuroinflammation is commonly seen in autism and neurodegenerative conditions.

The researchers also found that these chemicals stimulated the production of free radicals – particles that can damage the basic building blocks of cells and that have been implicated in a number of brain diseases. The chemicals also disrupted neuron microtubules. "Disrupting microtubules affects the function of synapses in mature neurons and can impair the movement of cells as the brain develops," Zylka said. "We know that deficits in neuron migration can lead to neurodevelopmental abnormalities. We have not yet evaluated whether these chemicals impair brain development in animal models or people."

Jeannie T. Lee, MD, PhD, professor of genetics at Harvard Medical School and Massachusetts General Hospital, who was not involved in this research, said, "This is a very important study that should serve as a wake-up call to regulatory agencies and the general medical community. The work is timely and has wide-ranging implications not only for diseases like autism, Parkinson's, and cancer, but also for the health of future generations. I suspect that a number of these chemicals will turn out to have effects on transgenerational inheritance."

Zylka's group also analyzed information from the U.S. Geological Survey, which monitors countywide pesticide usage, as well as the Food and Drug Administration and the U.S. Department of Agriculture, which test foodstuffs yearly for pesticide residues. Of the chemicals Zylka's team studied, only the usage of pyridaben has decreased since 2000. Rotenone use has remained the same since 2000. However, the use of all the fungicides in this group has increased dramatically over the past decade. Indeed, a study from the Environmental Protection Agency found that pyraclostrobin is found on foods at levels that could potentially affect human biology, and another study linked pyraclostrobin usage to honeybee colony collapse disorder.

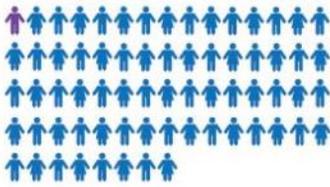
The pesticide rotenone was previously implicated in Parkinson's disease through replicated animal experiments and through human epidemiological studies. The 2015 UNC study highlighted on page one of this newsletter found that Parkinson's disease is much more common in older adults with autism than in older adults without autism.

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Community Report on Autism 2016 From the Autism and Developmental Disabilities Monitoring Network

NUMBER OF CHILDREN IDENTIFIED WITH ASD

1 IN 68



Findings from CDC's Autism and Developmental Disabilities Monitoring (ADDM) Network show that the estimated percentage of children identified with autism spectrum disorder (ASD) remains high. About 1 in 68 or 1.5% of 8-year-old children were identified with ASD based on tracking across multiple areas of the United States. These findings indicate that there continue to be many children living with ASD who need services and support, now and as they grow into adolescence and adulthood.

The North Carolina Autism and Developmental Disabilities Monitoring Program (NC ADDM) – a multisite ASD surveillance program, is part of this national effort to estimate the number of children with ASD and intellectual disabilities, funded by the Centers for Disease Control and Prevention. The ADDM's goal is to review health and education records to provide the most accurate data possible on the prevalence of these disorders to inform programmatic and fiscal planning that supports the education and health of children with these disabilities.

Julie Daniels, PhD, is Associate Professor in the Departments of Epidemiology and Maternal and Child Health in the Gillings School of Global Public Health at UNC. Since October 2002, Dr. Daniels has led the NC site for two, long-standing CDC sponsored studies: 1) The North Carolina Autism and Developmental Disabilities Monitoring Program (ADDM) – a multisite ASD surveillance program, and 2) The North Carolina Center for Autism and Developmental Disabilities Research and Epidemiology, a multi-site collaborative that conducts the Study to Explore Early Development (SEED), a large case-control study of the causes and correlates of ASD.



Julie Daniels, PhD

ASD research is challenging because ASD presents very heterogeneously, diagnosis requires extensive behavioral assessment (not a biological test), and there is not a uniform point of entry into care or diagnosis (both health and educational systems identify children with ASD). Thus, accurate estimates of the number of affected individuals has been elusive. The most severe cases of ASD are identified as toddlers, while mild cases may go completely undiagnosed. After a decade of monitoring a rise in ASD prevalence estimates using a systematic approach, we now estimate approximately 1/68 children age 8 years has an ASD. Understanding the rise in *documented* ASD has been challenged by changing diagnostic criteria, continual introduction of new screening and diagnostic instruments, and increased public and provider awareness. Yet, because so little has been known about ASD until the last decade or so, what seems like a basic contribution (prevalence estimation), has provided the basis for great change in the forecast for ASD intervention, research, and services. In December 2012, Autism Speaks, the primary non-government agency driving ASD research and support, listed ADDM's estimates of ASD prevalence among the [Top Ten Advances in Autism Research 2012](#). The high ASD prevalence has shaped federal research priorities, prompted change in programmatic planning, and supported insurance policy reform. In 2015, North Carolina and several other states passed legislation to provide insurance coverage to support behavioral interventions for children with ASD.



North Carolina Highlights on the Prevalence of Autism Spectrum Disorders

The data in the NC ADDM report reflect children who were 8 years old in 2012 (born in 2004) in central North Carolina (NC). NC counties include Alamance, Caswell, Chatham, Davidson, Durham, Forsyth, Guilford, Orange, Randolph, Rockingham, and Wake.

- 1 in 59 children 8 years of age have ASD in central NC. This is slightly higher than across 11 ADDM sites.
- ASD prevalence rates did not change significantly between 2010 and 2012. Yet, it is too soon to tell if the percentage of children identified with ASD over time is stabilizing.
- Hispanic children are much less likely to be identified with ASD than black or white children in NC and at other ADDM sites. *Targeted outreach and screening may be needed to better identify Hispanic children with ASD.*
- Among all ADDM sites, central North Carolina had the highest proportion of children identified with ASD who had received a comprehensive developmental evaluation by age 3 years (60%).
 - 42% presented with general developmental concern by age 12 months and 77% by age 24 months. *Still more can be done to ensure that all children are evaluated as soon as concerns arise.*
- 83% of children identified with ASD were receiving special education services in school; for 58% of those, the primary service classification was for ASD. *Many children, not just with ASD, need can benefit from special services to help them thrive.*

For more information, visit: NC ADDM at <http://ncaddm.unc.edu>

Eye Tracking Reveals Impaired Attentional Disengagement Associated with Sensory Response Patterns in Children with Autism

Children at-risk for and diagnosed with autism spectrum disorder (ASD) have demonstrated differences in attention, as well as responses to environmental stimuli. Such attentional and sensory differences may contribute to social-communicative difficulties and other features of ASD, such as over-focused and perseverative behaviors. We examined the performance of children with ASD, as compared to children with developmental delays (DD) or those developing typically, during an experimental “gap-overlap” task, in order to inform our understanding of how sensory aspects of objects may impact attentional flexibility in early childhood.

The gap-overlap task used eye tracking technology to automatically capture the child’s ability to attend to either still or moving images of objects with interesting visual and auditory properties, such as a spinning globe or a vibrating colorful ball, presented on a computer screen. The task included several conditions that assessed the flexibility of visual attention by measuring how often and how quickly individuals move their eyes from a central point of focus (which was either a still visual image, a moving visual image, or a moving visual image with sound added) to an image of a rectangular outline presented in the periphery of the screen. Sometimes the images were separated in time (gap), and sometimes they were presented simultaneously (overlap), hence the name “gap-overlap” for this type of experiment. Caregivers also completed the Sensory Experiences Questionnaire (SEQ), which measures the frequency of their children’s behavioral responses to various sensations they encounter in everyday activities such as brushing teeth or reacting to sounds such as a siren or vacuum cleaner.



Stimuli were presented on a computer monitor while eye movements were recorded with eye tracking technology.

As expected, for all groups, the most challenging conditions for successfully disengaging attention were those in which the central and peripheral images were presented simultaneously (overlap condition), and those in which the central images were dynamic (moving) rather than static (still) in nature. However, children in the ASD group showed less overall attentional flexibility in two ways. First, they disengaged from the central image less often than the children in either the typical or DD groups, and they shifted their eyes to the peripheral image less often than the children in the DD group. Second, their attentional flexibility was impacted in the form of reduced speed to disengage attention when dynamic images were presented with sound as compared to when they were presented silently. Otherwise, the findings revealed that when the ASD group disengaged and shifted their attention, their speed of disengagement was comparable to children in both the typical and DD groups. Together, these findings suggest that attentional disengagement difficulties in young children with ASD were significantly impacted by multimodal sensory input.

Another novel contribution of this study was the finding that, for children with ASD or DD, three clinically-derived sensory response patterns (as measured by the SEQ) were differentially related to attention disengagement difficulties on the experimental task. Specifically, high levels of hyporesponsiveness (under-reactivity to sensations) and sensory seeking (intense sensory interests or cravings) were associated with poorer (less frequent and slower) attentional disengagement, whereas high levels of hyperresponsiveness (over-reactivity to sensations) was associated with better (more frequent and faster) disengagement. These findings suggest that certain sensory response patterns, particularly hyporesponsive and sensory seeking behaviors) may reflect or interfere with attentional flexibility, whereas other patterns (hyperresponsive behaviors) may facilitate the deployment of attentional focus.

The findings from this study suggest that development of interventions that manipulate both the sensory-perceptual features as well as the timing of environmental stimuli may be useful to improve attentional flexibility in young children with ASD. Improving such foundational attention shifting skills may lessen the severity of ASD core symptoms, as well as improve meaningful engagement with objects and people in daily life.

Senior authors on the project are Grace Baranek, Ph.D., Professor and Associate Chair for UNC Research Department of Allied Health Sciences, Program for Early Autism Research, Leadership & Service and Aysenil Belger, Ph.D., Professor and Director of Neuroimaging Research in the Department of Psychiatry at UNC, Professor, Duke-UNC Brain Imaging and Analysis Center, and Director, CIDD Clinical Translational Research Core. First author Maura Sabatos-DeVito, Ph.D., is a former Psychology graduate student at UNC, currently a Postdoctoral Associate in the Psychiatry Department at Duke; Sarah E. Schipul, Ph.D., is a former CIDD T32 Post-doctoral fellow currently working with Drs. Baranek and Belger; and John C. Bulluck is a Research Systems Analyst in the Department of Allied Health.



CIDD Clinicians Attend Social Thinking® Training

Margaret DeRamus, M.S., CCC-SLP, speech and language pathologist, and Sherry Mergner, MSW, LCSW, clinical social worker, attended the Social Thinking Clinical Training (STCT) program for professionals in Santa Clara, California on March 21-23, 2016. The Social Thinking® methodology was founded by Michelle Garcia Winner, MA, CCC, SLP and is used to “explore the abstract nature of the social world and in order to teach how others can improve their social interpretation and social competencies using concretely defined frameworks and strategies.” For more information regarding Social Thinking, go to www.socialthinking.com.

Both Ms. DeRamus and Ms. Mergner have attended a number workshops and conferences on this topic and have been studying and practicing this methodology for many years. At the STCT, DeRamus, Mergner and six other clinicians from around the world met with Michelle Garcia Winner, MA, CCC-SLP and Pamela Crooke, Ph.D., CCC-SLP to observe their clinical practice live and engage in problem-solving discussions about different client needs. Other focuses of the training included gaining in-depth understanding of the Informal Dynamic Social Thinking assessment process and learning strategies to address anxiety in clients with social cognitive challenges.

Ms. DeRamus and Ms. Mergner work with clients across the life span and are excited about applying their new knowledge and skills to their own work with individuals with social cognitive challenges.

The CIDD offers Social Smarts programs, including a summer camp for children, based on the Social Thinking methodology. DeRamus and Mergner are also available to provide individual and small group sessions to individuals of all ages with social cognitive challenges (regardless of diagnosis label), as well as to provide consultation to schools and parents via education sessions.

Social Thinking is a language-based approach best utilized by people with solid language and intelligence, ages 4 years through adulthood. For more information contact: Sherry Mergner at sherry.mergner@cidd.unc.edu or Margaret DeRamus at margaret.deramus@cidd.unc.edu.



Left to Right: Yukiyo DeLong, Stacey Gershwin, Kimberly Davy, Sherry Mergner, Margaret DeRamus, Michelle Garcia Winner, Pamela Crooke, Celina Wright, Sheri Hughes, Mary-Beth Friday



Left to Right: Lynn Makor, Stephanie Lowe Austin, William Hussey

School Psychology News

On March 13th, during the Spring Meeting of representatives for school psychology school districts and charter schools across the state, Lynn Makor (NCDPI Consultant for School Psychology) along with NCDPI Exceptional Children Division Director, William Hussey, recognized practitioner Stephanie Lowe Austin (formerly of Asheboro City Schools, now with Rockingham County Schools) for a recent award she received at the national level. In February, during the annual convention of the National Association of School Psychologists, Ms. Austin was awarded Practitioner of the Year. This award recognizes the importance and challenge of going beyond day-to-day responsibilities as a school psychologist practitioner. Since this award was established at the national level in 1991, *this is the first time that a practitioner from the state of NC has received it.*

Additionally, during the Spring Meeting, Mr. Hussey spent time discussing the recently established NC School Mental Health Initiative, a multi-disciplinary partnership with broad representation consisting of public educators, community-based mental health clinicians, lawyers, advocates, university faculty, and parents. Through collection and analysis of state level data, this group will develop recommendations for policy and/or legislative change to ensure that public school students in North Carolina have equitable access to a full continuum of high-quality and well-coordinated mental health services.

Project STIR (Steps Toward Independence and Responsibility) and PATHSS (Project Achieve for Transitioning High School Students)



Pictured left to right: Robyn Dorton, Hannah Barlow, Brittany Newby, Brian O'Donnell, Wilson Finks, Deb Zuver, and Jake Gerber

CIDD's Project STIR (Steps Toward Independence and Responsibility) is a team of trainers with and without intellectual developmental disabilities (IDD) that provides hands-on training in self-advocacy and leadership skills for individuals across the country. They recently provided workshops in self-advocacy tools for PATHSS participants right here on the UNC-Chapel Hill campus. PATHSS (Project Achieve for Transitioning High School Students) is an innovative program involving high school students with I/DD in their final two years of high school. Developed as a collaborative initiative between Chapel-Hill Carrboro City Schools and the University of North Carolina at Chapel Hill, PATHSS promotes positive adult life outcomes by focusing on critical transition areas of employment, community access, daily living skills, and self-advocacy. For more information on PATHSS please contact Dana Hanson-Baldauf, PATHSS Program Coordinator, at dhansonbaldauf@chccs.k12.nc.us

PODD

Pragmatic Organization Dynamic Display

**DATE
CHANGE**

Audience: Speech and language pathologists, assistive technology specialists, special educators, parents, and others working with children with limited speech.

2-Day Introductory Workshop: Pragmatic Organization Dynamic Display (PODD)

Presented by Debbie Reinhartsen, PhD, CCC-SLP

This workshop is being offered for 13 Credit Hours

**May 23 & 24, 2016
8:30—4:30 daily**

Location: The Carolina Institute for Developmental Disabilities
101 Renee Lynne Court Carrboro, NC 27510

Children who have complex communication needs or have only limited speech, in addition to other challenges, often struggle to interact and communicate. This may include children who have physical disabilities, multiple disabilities, sensory processing challenges, limited social interaction skills, and/or a range of cognitive limitations and learning difficulties.

This 2-day course will demonstrate the use of a Pragmatic Organization Dynamic Display (PODD) approach developed by Gayle Porter. Generic templates for multi-page "lite tech" communication books have been carefully designed to support genuine communication for a variety of functions throughout the day. These templates may be customized for a range of access methods and other individual needs.

Learn strategies for creating multi-modal language learning environments that provide receptive models and expressive opportunities for language development, as well as, strategies for teaching and using PODD with children and their communication partners. Videos and case examples will be shared. Participants will have an opportunity for hands-on practice with PODD Communication books.

To register online visit: <http://tinyurl.com/hyjrfuw> (Registration deadline is May 16th)

Neuron Type-Specific Gene Loss Linked to Angelman Syndrome Seizures



Ben Philpot, PhD

The gene UBE3A plays a critical role in early neurological development. If UBE3A is overexpressed – or if the enzymatic function of UBE3A protein is hyperactive – autism ensues. A lack of functional UBE3A causes Angelman syndrome (AS), a neurodevelopmental disorder characterized by severe developmental delay, motor deficits, absence of speech, and, in most cases, epilepsy. Prevention of seizures in AS model mice by restoring UBE3A after birth has proved largely unsuccessful, indicating that the timing of gene expression is also important. And what about *where* UBE3A is expressed? That was the question UNC School of Medicine researchers wanted to answer.

In the journal *Neuron*, Ben Philpot, PhD, CIDD Investigator and Professor of Cell Biology and Physiology, published his lab's research analyzing the spatial determinants for UBE3A loss in the development of seizures and other hyperexcitability phenotypes in the brain. Philpot's team used novel mouse models to show that selective UBE3A loss from GABAergic brain circuits – comprising neurons that release the inhibitory neurotransmitter GABA – led to the same kinds of seizure behaviors and electroencephalographic (EEG) abnormalities typically found in AS model mice, which lack UBE3A in all neurons.

Matt Judson, PhD, the study's first author and a research associate in Philpot's lab, said that the findings open the door for further investigations into the specific effects of UBE3A loss in other types of neurons. "Our study has helped determine that UBE3A loss specifically from GABAergic neurons is what's critical for seizures in Angelman patients," Judson said. "But UBE3A loss from other neuron types may drive other phenotypes associated with the condition. This remains to be explored."

Given the inhibitory function of GABAergic neurons, the results are superficially unsurprising. GABAergic neurons transmit inhibitory signals that are necessary to balance the excitatory impulses mediated in large part by glutamatergic neurons. When this balance shifts too much in favor of excitation, epilepsy and other pathological outcomes can occur. Previous studies indicated that glutamatergic neurons might play a bigger role in the development of seizures and epilepsy in AS. Philpot's lab showed that this is not the case.

Loss of UBE3A in glutamatergic neurons does impair their ability to receive certain inhibitory signals. Because these neurons are typically associated with excitation, this impairment would presumably promote hyperexcitability. Instead, the UNC researchers found that glutamatergic UBE3A loss alone was not sufficient to produce hyperexcitability. "Our data indicate that impaired glutamatergic neurons don't drive the hyperexcitability," said Judson. "However, deficits in glutamatergic neurons could be related to other AS phenotypes."

Elucidating UBE3A functions within specific types of neurons may provide researchers with a clearer understanding of the molecular pathways both upstream and downstream, and may reveal new therapeutic strategies. "Understanding the relevant cell types and regions for specific cell types should allow us to learn more about cellular pathways important for finding new drug targets," said Philpot, a member of the UNC Neuroscience Center.

While restoring UBE3A function in GABAergic neurons appears to be the most direct therapeutic strategy for the prevention of seizures in AS, it is still possible to reverse such symptoms in other ways. "Previous research showed that it is much better to restore UBE3A function earlier than later, as the earlier you restore UBE3A the more phenotypes normalize," said Philpot. "However, we also know that there are other ways to overcome phenotypes that are not linked to UBE3A restoration. For example, seizures can still be treated in adults with anti-epileptics."

Ben Philpot will become the Associate Director of the UNC Neuroscience Center July 1.



2016 Community Talk Series

Join us on Wednesday, **May 11th** from 6:30 to 8:00 in the CIDD Castelloe Conference Room 101.

Anthony D. Nicholson, Esq. will speak on "**ABLE Accounts**"

Mr. Nicholson will discuss how an ABLE account can be useful for a person with a disability, how to set up an ABLE account at a bank, the special rules and limitations for ABLE accounts and provide a comparison between ABLE accounts and special needs trusts.

To RSVP or for more information, contact: Debbie B. Reinhartsen at (919) 966-4138 or Debbie.Reinhartsen@cidd.unc.edu



hope never ends...



Please Join the "UNC CIDD" Team
at the Angelman Syndrome Foundation (ASF) Walk
on Saturday, May 21, 2016
at the Imperial Center in Durham.

As the location of the first Angelman Syndrome Clinic in the US,
we want to show a worthy CIDD presence at the ASF walk in NC.

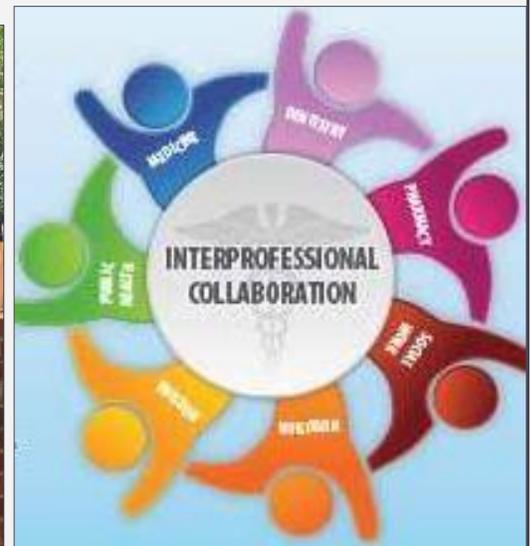
Use the following link to register and/or donate to our team goal:
<https://secure.e2rm.com/registant/TeamFundraisingPage.aspx?>

Integrated Care: Behind the Scenes

*Using an Interprofessional Team to Treat Co-Occurring
Developmental Disabilities & Behavioral Health in a Primary Care Setting*



CIDD faculty members have been involved with a collaborative effort to create a training that demonstrates an interprofessional team to treat co-occurring developmental disabilities and behavior health needs. Sherry Mergner, Clinical Assistant Professor and AHEC Liaison, School of Social Work and LEND Social Work Faculty, CIDD; Morgan Parlier, Clinical Instructor, Social Work Faculty, CIDD; and Deb Zuver, Education Consultant and Director of Advocacy Initiatives and Project STIR, CIDD; were part of the team that includes School of Social Work Family Support Program and UNC-PrimeCare. *The Integrated Care: Behind the Scenes* training project is funded by an AHEC (Area Health Education Center) Innovation grant. This learning approach uses a realistic, video-taped scenario that will be paused at intervals for audience reflection and discussion. A brief, two-hour version was offered this spring; the full-day training is upcoming.



Pictured left to right: Anne Jones, Deb Zuver, Barbara Leach, Tamara Norris, Sherry Mergner, Meryl Kanfer, Morgan Parlier



Welcome to T32 Postdoctoral Trainee Sarah Sinnett

Sarah Sinnett, Ph.D. received her doctorate in Neurobiology from the University of North Carolina at Chapel Hill. While working in Dr. Jay Brenman's lab, she developed a fluorescence-based, high-throughput screening assay for the discovery of novel small molecules that bind the metabolic regulator AMP-activated protein kinase (AMPK). Because this assay is biased toward the discovery of molecules that bind the AMPK regulatory region (as opposed to the canonical kinase active site), any drugs discovered with the help of this assay are less likely to have off-target effects on other kinases. AMPK modulators initially identified with this assay could potentially be used as treatments for cancer, diabetes, and stroke. Dr. Sinnett is now working with Dr. Steven Gray, Assistant Professor of Ophthalmology and member of the CIDD. Dr. Sinnett's research seeks to develop safe, effective gene therapies for Rett Syndrome (RTT). RTT is an X chromosome-linked neurodevelopmental disorder caused by inactivating mutations in the transcription regulator methyl CpG-binding protein 2 (MeCP2).

Dr. Sinnett will assess multiple approaches to safely deliver the WT MeCP2 gene and regulate MeCP2 expression in transduced cells. Over the course of her project, Dr. Sinnett will assess the safety and efficacy of these gene therapies on multiple genetic backgrounds. Ultimately, a gene therapy that has been validated on multiple genetic backgrounds would be an excellent treatment to test in a heterogeneous patient population.



Sarah Webster Awarded Judith Gravel Fellowship in Pediatric Audiology

Congratulations to Sarah Webster, recipient of the 2016-2017 *Judith Gravel Fellowship in Pediatric Audiology*. A native of Oakton, Virginia and graduate of the University of Virginia, Sarah came to UNC in the fall of 2013 to begin her AuD program. She has been strongly committed to a career in pediatric audiology throughout her graduate program and has taken on additional coursework and leadership experiences through a federally funded training grant in pediatric audiology at UNC and as a graduate student funded by the North Carolina LEND Program (Leadership Education in Neurodevelopmental and Related Disabilities). Sarah has a special interest in the delivery of pediatric audiology services to Spanish-speaking families and is focusing her LEND project on the development of a Resource Guide in Spanish for families with newly diagnosed infants and young children. Sarah will begin her fourth year externship in June at UNC Hospitals where she will be the seventh Gravel Fellow. As she contemplates the coming year, Sarah notes, "Dr. Gravel's immense impact on the field of pediatric audiology is evident in

the literature and when speaking with those who knew her. Her passion for research, teaching, and clinical service was unparalleled and I am truly honored to continue my training through a fellowship in her name. I look forward to learning from the dedicated and experienced pediatric audiologists at UNC Hospital as I pursue my goal of making a difference in the lives of infants and children with hearing loss."



Jasmine Shah Awarded Lindquist Undergraduate Research Fund Grant

Jasmine Shah, a junior Psychology and Neuroscience major and an undergraduate research assistant in the lab of Dr. Gabriel Dichter, has been awarded an Undergraduate Research Grant from the Lindquist Undergraduate Research Fund. Her project will focus on the effects of comorbid depression on decision-making in adolescents with autism spectrum disorder (ASD). It has long been recognized that ASD most typically presents with a range of comorbidities, including high rates of ADHD, anxiety disorders, and mood disorders. Rates of clinically impairing depressive symptoms are particularly high (some reports as high as 72%) in higher functioning adolescents with ASD, yet the effects of comorbidities on socio-emotional and cognitive functioning in ASD have rarely been addressed. The goal of Jasmine's study will be to examine the impact of comorbid major depressive disorder on cognitive functioning in adolescents with ASD. This project will build on the Master's Thesis research of Maya Mosner, a

clinical psychology doctoral student also in Dr. Dichter's lab. The support of the Lindquist Undergraduate Research Fund will enable Jasmine to extend this Master's project to include an examination of the effects of major depression on effort-based decision making in adolescents with ASD and will support her travel to present her research findings at a national conference.

NC-LEND Pediatric Audiology Trainees Collaborate with the North Carolina Division of Public Health to Conduct Statewide Analysis of EHDI Services

NC-LEND trainees were well represented this year at the National EHDI Conference in San Diego, March 13-15, 2016, when they presented a poster entitled: "Regional Analysis of EHDI Outcomes in North Carolina." The EHDI acronym, which stands for Early Hearing Detection and Intervention, represents the systems of care responsible for screening, diagnosis, and intervention for infants with congenital or early onset hearing loss. EHDI programs across the nation have committed themselves to the "1-3-6 goals" of screening infants for hearing loss no later than one month of age with diagnosis no later than three months of age and intervention no later than six months of age. Remarkable progress has been made over the past 20 years since newborn hearing screening has developed into a standard of care but challenges remain, especially with regard to timely diagnosis and intervention.

During the 2015-2016 academic year, six audiology graduate students from UNC's Doctor of Audiology (AuD) program funded in their second or third year by the North Carolina LEND Program, collaborated with staff from the North Carolina Division of Public Health to conduct a statewide analysis of EHDI-related outcomes for 12 newly created geographic regions, to determine strengths, challenges, and opportunities for EHDI program development and improvement. The 2015 reorganization is intended to improve continuity of care and greater familiarity with regional providers. With mentoring and technical assistance provided by state EHDI manager Marcia Fort, AuD, and Jackson Roush, NC LEND director, the project had four goals: to obtain baseline 1-3-6 data for each of the new regions; to conduct an analysis of strengths, challenges, and opportunities for each region, to summarize the data obtained for use by the EHDI program for evaluation and strategic planning, and to engage future professionals in a project that combined a valuable learning experience with important contributions to the state EHDI program.

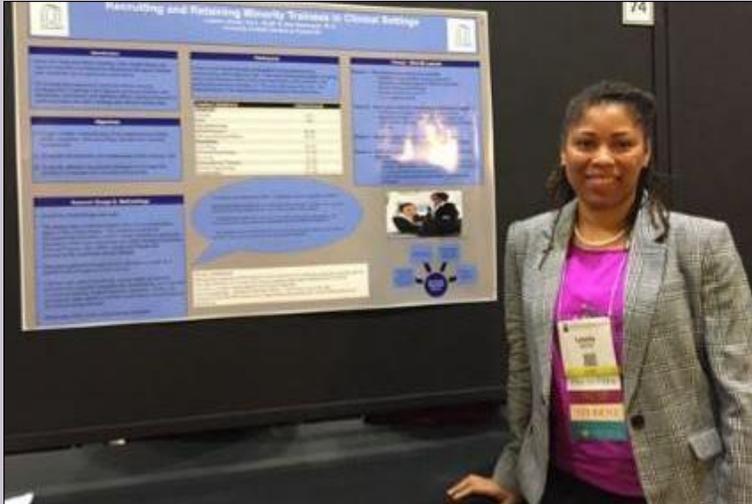
The study provided the first regional analysis since North Carolina's statewide EHDI reorganization in 2015 and the findings will be incorporated into EHDI goals and objectives with the aim of improving the quality and accessibility of services for children who are deaf or hard of hearing and their families. NC-LEND is one of ten LEND programs in the U.S. receiving supplemental funding to increase the number of pediatric audiologists with expertise in the diagnosis and treatment of hearing loss in infants and young children.



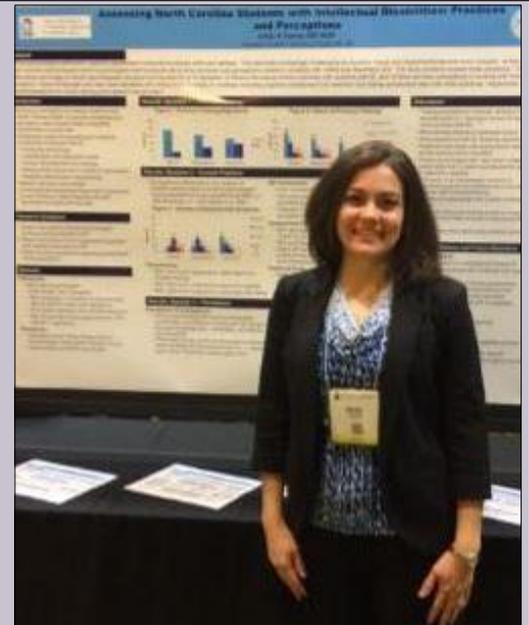
Pictured here in front of their poster presented at the national EHDI conference in San Diego, left-right, Heather Mazzola, Sarah Webster, Kim Holden, Lauren Johnson, Dani Warmund, and Conner Haring.

CIDD/LEND Faculty and Trainees at the NASP 2016 Annual Convention

The work of several trainees and faculty members was presented across several poster sessions at the National Association of School Psychologists (NASP) 2016 Annual Convention in New Orleans, Louisiana February 10-13.



Pictured Above: Former trainee Latasha Woods presented her poster entitled "Recruiting and Retaining Minority Trainees in Clinical Training Settings," a self-study she conducted with Dr. Jean Mankowski at the CIDD.



Pictured Above: Current intern Ashley Costner presented a poster covering her dissertation work, entitled "Assessing North Carolina Students with Intellectual Disabilities: Practices and Perceptions."



Pictured Above: Current trainees Erica Fornaris and Loren Wright collaborated with a fellow graduate student from their program and presented a poster summarizing their research on a "Social-Emotional Learning Curriculum Development for First-Year College Students."

Also present at the conference were Ms. Lynn Makor, current trainee Brendan Hendrick, and 2016-2017 LEND trainee Jackie Lawrence who presented on her current research on bullying and cyberbullying prevention and intervention.



Pictured Above: LEND faculty member Donna Yerby and research associate Crystal Edwards presented a poster on their work, "Vocabulary Development in Typical and At-Risk Elementary School Writers."

NC-LEND Welcomes Two New Partners

This year the North Carolina LEND Program has enjoyed working with two new partners, the graduate program in genetic counseling at UNC Greensboro and the Department of Health Policy and Management in the Gillings School of Global Public Health at UNC Chapel Hill.

The Genetic Counseling master's program at UNCG in the School of Health and Human Sciences is the only graduate program of its kind in North Carolina. The program is directed by Professor Nancy Callanan and our first LEND trainee in genetic counseling is Ms. Lillian Howard. A native of Clutier, Iowa, Lillian is in her first year of the master's program. She will graduate in May 2017 and is planning to return to Iowa as a genetic counselor to specialize in neurogenetics. Her mentor and LEND discipline head for genetic counseling is Ms. Megan Mann Pollard. They work closely together in their rotations at UNC Hospital and CIDD where they see patients at the Angelman Syndrome multidisciplinary clinic. Lillian's LEND project focuses on parent perceptions of how similar clinics can best provide for their children with Angelman Syndrome and what they most desire from clinics visits.

The Department of Health Policy and Management is committed to training future leaders in management, policy making, and health services research to address the complex challenges of health-care delivery. Our first LEND trainee from the Department, Ms. Crystal Miller Moore, is working with Dr. Kristen Hassmiller Lich, an expert in health systems improvement and decision support modeling.

Crystal will graduate in May and has accepted an offer of employment at Dixon Hughes Goodman where she will be working with hospitals and health systems in the areas of Medicare and Medicaid cost reports, wage index and reimbursement analysis. Crystal's LEND project is exploring ways of improving the delivery of newborn hearing screening tests and connection to care through reimbursement analysis and system support mapping.



Lillian Howard (standing) with LEND mentor, Megan Mann Pollard (sitting)



Crystal Miller Moore (left) with LEND mentor, Dr. Kristen Hassmiller Lich (right)

Could a New Class of Fungicides Play a Role in Autism, Neurodegenerative Diseases? *continued*

Previous work has also shown that a single dose of the fungicide trifloxystrobin reduced motor activity for several hours in female rats and for days in male rats. Disrupted motor function is a common symptom of Parkinson's disease and other neurological disorders. The related fungicide picoxystrobin impaired motor activity in rats at the lowest dose tested. Zylka added, "The real tough question is: if you eat fruits, vegetables or cereals that contain these chemicals, do they get into your blood stream and at what concentration? That information doesn't exist." Also, given their presence on a variety of foodstuffs, might long term exposure to these chemicals – even at low doses – have a cumulative effect on the brain?

Zylka noted that conventionally grown leafy green vegetables such as lettuce, spinach, and kale have the highest levels of these fungicides. But due to each chemical's effectiveness at reducing fungal blights and rust, crop yields have increased and farmers are expanding their use of these chemicals to include many additional types of food crops. Zylka's team hopes their research will encourage other scientists and regulatory agencies to take a closer look at these fungicides and follow up with epidemiological studies. "Virtually nothing is known about how these chemicals impact the developing or adult brain," Zylka said. "Yet these chemicals are being used at increasing levels on many of the foods we eat."

Zylka's previous work on drugs that affect autism-linked genes, published in Nature, can be [found here](#).

Zylka will serve as Director of the UNC Neuroscience Center effective July 1.



**CIDD Together with TEACCH
“Light It Up Blue!”
for
2016 World Autism Awareness Day**

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