

FRIENDS of the MIND



In this issue of *Friends of the MIND*, we celebrate past achievements and new beginnings. We continue to celebrate our 20th anniversary, noting

a little about our history and highlighting some key achievements and milestones. Ultimately, these highlights (and many we did not have space to list) are important to celebrate as they are evidence of progress in helping families affected by neurodevelopmental disorders through scientific advances, clinical activities and education. Nevertheless, there is still much we do not understand about neurodevelopmental disorders, and so much more needs to be done to help affected individuals and families.

That is why it is so heartening to be able to report on some new projects and initiatives in this issue. MIND Institute faculty have received new NIH grants to understand more about early development in children with Down syndrome and about the transition from school to adulthood for individuals with fragile X syndrome. Philanthropy has also launched two other new activities. The Azrieli Foundation awarded the MIND Institute our largest single gift to establish a new Canadian-U.S. clinical trials research consortium focused on fragile X syndrome. This consortium will support many new research initiatives focused on the discovery of innovative treatments. Finally, my wife and I were able to start a small fund to help graduate students conduct innovative research to advance their careers, solidify their commitment to families affected by neurodevelopmental disorders, and move us toward better treatments. I am thankful and privileged that my family and I are part of the history and the future of the MIND Institute.

Leonard Abbeduto
Director, UC Davis MIND Institute



MIND Institute: Going strong at 20

Twenty years ago a small group of Sacramento-area parents of children with autism decided it was time to fill a glaring hole in medical research: understanding and treating autism and other neurodevelopmental disorders.

The result was the creation of the UC Davis MIND Institute. The MIND Institute has been celebrating its 20th anniversary all year with various events, including public lectures and an open house and a special dinner for staff and faculty planned for September 21.

The influential parent group secured private and state funding and passage of a bill establishing the UC Davis MIND Institute. The medical center chipped in an

additional \$1.5 million and a commitment to house the center on the health system campus. Two years later, the state approved \$30 million to build the MIND Institute with both clinical space and research laboratories.

Since its founding, the MIND Institute has built a vast and multidisciplinary team

 **Going strong** continued on back page

The MIND Institute's Big Idea

In 2015, UC Davis leaders called for "Big Ideas" to offer potential donors the opportunity to make a meaningful impact with their contributions. Nearly 200 ideas – all innovative and ambitious – were received from faculty, staff and students. After rigorous review, 13 ideas were selected, including one from the MIND Institute.

In its Big Idea, the MIND Institute will use technology and community partnerships to bring help and hope to families affected by autism across the lifespan. We will use technologies from virtual reality to real-time distance video to provide services and support in homes, schools and workplaces. We will expand the reach of our expertise by training doctors, nurses, teachers, employers, family members and persons with autism. We will drive innovation in technology, advance science, and create new ways of helping people with autism in California, the nation and beyond.

For more information on the University's Big Ideas visit bigideas.ucdavis.edu and for more information on the MIND Institute's Big Idea visit bigideas.ucdavis.edu/autism-treatment-research.

MIND 20th Anniversary Highlights

1998

UC Davis Medical Investigation of Neurodevelopmental Disorders (MIND) Institute is established

2000

MIND Institute Evaluation Clinic (now the Massie Family Clinic) opens in the Lawrence J. Ellison Ambulatory Care Center building

2001

MIND Institute partners with Cure Autism Now and the National Alliance for Autism Research to launch the first annual International Meeting for Autism Research (IMFAR)
Center for Children's Environmental Health is established with a grant from the National Institute of Environmental Health Sciences and the EPA

2002

NICHD Collaborative Program of Excellence in Autism initiated

2003

110,000-square-foot MIND Institute complex opens
CHARGE (Childhood Autism Risks from Genetics and the Environment) study begins



2004

Autism Phenome Project launches

2004

Randi and Paul Hagerman discover FXTAS (fragile X-associated tremor/ataxia syndrome)
Autism Research Training Program for postdoctoral fellows launches

2006

UC Davis designated a University Center for Excellence in Developmental Disabilities (UCEDD) by the U.S. Health and Human Services Administration

2008

Early Steps, an Autism Centers of Excellence (ACE) Network Treatment Study, launches

2008

MIND Institute research shows that some cases of autism may be traced to immune systems of mothers during pregnancy

2009

MIND Institute study shows that California's dramatic autism increase not solely due to better diagnosis or diagnostic substitution
UC Davis researchers develop newborn test for fragile X syndrome

2011

Boys with regressive autism, but not early-onset autism, have larger brains, MIND Institute research shows

2012

TIME magazine names research by Sally Rogers, who created ESDM autism intervention, a top-10 medical breakthrough of the year

Study by MIND Institute researcher shows higher anxiety associated with poorer functioning in children with 22q11.2 deletion syndrome

Folic acid intake associated with reduced risk of autism, MIND Institute study finds

2013

MIND Institute joins the Intellectual and Developmental Disabilities Research Center (IDDDRC) Network

2013

MIND Institute research indicates that children as young as 6 months have excessive cerebrospinal fluid – a possible predictor of autism
NIH ACE Network Treatment Study launched

2014

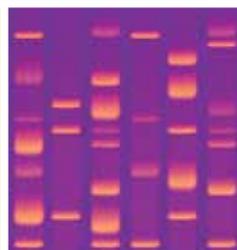
MIND Institute study shows that training parents of infants at risk for autism in ESDM may prevent later development of autism symptoms

2016

MIND Institute funded as the Northern California Leadership and Education in Neurodevelopmental and Related Disabilities training program

2016

MIND Institute helps launch new paradigm for clinical trials in neurodevelopmental disorders with multi-site NeuroNEXT grant



2017

The Center for the Development of Phenotype-Based Treatments of Autism Spectrum Disorder, established with an ACE grant from the National Institutes of Health

MIND Institute becomes site of National Fragile X Foundation Biorepository

2018
celebrating
20 years



Major gift unites researchers in two countries to take on fragile X syndrome



A historic gift to the UC Davis MIND Institute will help unite researchers from two nations to assist families everywhere who are dealing with fragile X syndrome, a neurodevelopmental disorder and the most common cause of inherited intellectual disability.

The \$2.3 million donation from the Canada-based Azrieli Foundation will help create a large international collaboration designed to leverage expertise and innovation around fragile X-related disorders. Fragile X syndrome is the most common known single-gene cause of autism.

“Any family that has had to face living with a brain disorder knows what it is like to live like a ‘pioneer’ – stepping into uncharted territory and going off in unknown directions, frequently without the aid of any scientific ‘map’ or treatment options,” said Naomi Azrieli, the foundation’s chair and CEO, and the sibling of a brother with fragile X syndrome. “For these families, the future looks much brighter than it did even just a few years ago, but there is so much more to be done.”

The Azrieli Foundation is one of the largest foundations in Canada and Israel and fulfills the philanthropic legacy of David Azrieli, a Holocaust survivor who became a successful architect and real estate developer in both countries before passing away in 2014.

Naomi Azrieli said neuroscience research is an area of extraordinary social impact, noting that about half the Canadian population has had a brain disorder that will impact their family. One in three will also have a disease, disorder or injury of

the brain, spinal cord or nervous system at some point, she added.

“The UC Davis MIND Institute has a stellar reputation as a collaborative international research center, and we hope to find a treatment together that will improve the quality of life for people with fragile X syndrome.”

In addition to her brother, some other members of Azrieli’s extended family also have fragile X syndrome. The condition usually comes with a normal life expectancy, but also requires lifelong care and support.

“Through research like that conducted at the MIND Institute we hope parents and families will have many more tools and treatments to help their children live independent, meaningful and productive lives,” she said.

The new gift will establish a new North American collaborative partnership with research teams from the University of Alberta Women and Children’s Health Research Institute, located in Edmonton, and the University of Montreal CHU Sainte-Justine Research Centre. Both are also receiving support from the foundation.

“Each of our sites has different areas of expertise, and this gift allows us to combine our strengths and experience and create a network that’s more than the sum of its parts,” said Leonard Abbeduto, MIND Institute director and Tsakopoulos-Vismara Endowed Chair of Psychiatry and Behavioral Sciences, who is an investigator on the new project.

The new network of researchers and clinical trials infrastructure will help the universities jointly conduct the largest controlled trial ever funded by a foundation of a new and potentially promising

targeted treatment for fragile X syndrome. Commonly used for diabetes, the drug metformin also has shown success in fragile X syndrome animal studies and positive effects in human patients during limited observations.

“If we can demonstrate significant benefit in those with fragile X syndrome, these findings will have an impact worldwide on treatment,” said principal investigator Randi Hagerman, endowed chair in fragile X research and the MIND Institute’s medical director.

Research data and samples will be made available to scientists worldwide to inform other genomic studies and assessments of personalized treatment approaches.

“In short, the UC Davis MIND Institute will be more nimble when it comes to searching for help for the families who depend on us,” said Abbeduto. “We’re extraordinarily grateful for this support.”



Volunteers from the California Autism Professional Training and Information Network take a break at the annual MIND Summer Institute on Neurodevelopmental Disorders event in Davis on August. 3.

UC Davis MIND Institute receives \$3.09 million for Down syndrome research



The UC Davis MIND Institute and Department of Psychiatry and Behavioral Sciences in August were awarded a five-year, \$3.09 million grant from the National Institute of Child Health and Development to research language development in young children with Down syndrome.

Angela John Thurman, a member of the MIND Institute faculty and assistant researcher in the Department of Psychiatry and Behavioral Sciences, leads the multi-institution project.

“Research shows communication difficulties emerge within the first years of life for most children with Down syndrome,” Thurman said. “These early challenges

create a developmental cascade that alters a child’s learning opportunities and trajectories for brain development.”

While Down syndrome is the leading genetic cause of intellectual disability, the development of evidence-based interventions lags behind that for other neurodevelopmental disorders because of a lack of research on the causes and consequences of the disorder. Recent discoveries using mouse models and advances in new interventions that target core symptoms of Down syndrome, however, led to the need for more robust translational research.

In collaboration with Colorado State University, Cincinnati Children’s Hospital

Medical Center and the University of Louisville, Thurman and colleagues will evaluate the feasibility, utility and appropriateness of pre-linguistic and early spoken language measures for measuring the effects of interventions for young children with Down syndrome. They also will determine if the measures work differently among individuals with the disorder at different ages and ability levels to ensure the best tools are used in future treatment studies.

Other UC Davis researchers include Danielle Harvey from the Department of Public Health Sciences and Leonard Abbeduto from the Department of Psychiatry and Behavioral Sciences.

Student Research Award established

With a pledge of \$25,000, MIND Institute Director Leonard Abbeduto and his wife, Terry McMenamin, established the Dorothy Ross Graduate Student Research Award Fund to support the research and professional development of graduate students who work with MIND Institute faculty and whose work will advance the mission of the institute.

Students can use the funds to help conduct their research (e.g., buying research supplies, reimbursing participants for travel), travel to a scientific meeting, or pay the fee to attend a specialized workshop or training.

“What makes the MIND Institute special is its support of an interdisciplinary approach to research, clinical care and training,” Abbeduto said. “So, graduate students from any discipline can benefit, provided that they are being mentored by a MIND Institute faculty member.”

“Graduate students from any discipline can benefit, provided that they are being mentored by a MIND Institute faculty member.” – Leonard Abbeduto

Dr. Abbeduto and his wife made the gift in memory of Dr. Abbeduto’s mother, Dorothy Ross, who passed away earlier this year from Alzheimer’s disease.

“My mother never had the opportunity to get much formal education, but she always encouraged her children to seek out educational opportunities. It seemed fitting to honor her memory with a gift to education.”

A committee of MIND Institute faculty will develop an application and selection process. The first awards are anticipated to be made in fiscal year 2019.



Immune system and gastrointestinal deregulation linked with autism

Researchers at the UC Davis MIND Institute have found that children with autism spectrum disorder (ASD) have reduced immune system regulation, as well as shifts in their gut microbiota. The immune deregulation appears to facilitate increased inflammation and may be linked to the gastrointestinal issues so often experienced by children with ASD. The research was published in the journal *Brain, Behavior, and Immunity*.

“Some children with ASD have this decrease in regulatory cytokines, which leaves them more prone to inflammation,” said Destanie Rose, a graduate student in the laboratory of Paul Ashwood and first author on the paper. “This increased inflammation may manifest as GI symptoms, allergies, asthma or some other form.”

While previous studies and clinical experience have shown that many children with ASD have gut issues, the causes have been mysterious. To better illuminate the problem, Ashwood, MIND Institute faculty member, senior author

and professor in the Department of Medical Microbiology and Immunology and colleagues studied children with ASD with and without GI symptoms, and typically developing children with and without GI symptoms.

“Some children with ASD have this decrease in regulatory cytokines, which leaves them more prone to inflammation. This increased inflammation may manifest as GI symptoms, allergies, asthma or some other form.” – Destanie Rose

The researchers analyzed blood and stool samples to assess both the immune response and microbial makeup. The children with ASD and GI issues showed a number of distinctions. They had higher levels of inflammatory cytokines compared to the children with ASD without GI symptoms.

The ASD/GI children also had lower levels of the protein TGF β 1, which is responsible for regulating the immune response. In addition, the group had higher levels of the protein zonulin, which regulates cell junctions in the GI tract, influencing gut permeability.

The study also found distinction in the microbiome between children with ASD and GI symptoms and typically developing children with GI problems. These findings illuminate the physiology and represent a first step toward delineating cause and effect.

“This work opens up interesting new avenues to determine how the microbiome may be driving the mucosal immune response in ASD or whether immune activation drives the microbiome changes,” Ashwood said. “Although it’s still early, this work suggests we need to find ways to ease inflammation to help these children.”

Other authors at UC Davis included Houa Yang, Milo Careaga, Heather K. Hughes, Kathy Angkustsiri, Melissa Rose, Irva Hertz-Picciotto, Judy Van de Water and Robin L. Hansen.

LEND Graduation

Congratulations to our recent LEND graduates! The Northern California Leadership Education in Neurodevelopmental and Related Disabilities program provides interdisciplinary and leadership training to clinicians, families, self-advocates and community leaders involved with developmental disabilities.

Visit health.ucdavis.edu/mindinstitute/education/lend/lend-index.html.



Help make a difference in the lives of families

Your donation to the UC Davis MIND Institute will help individuals and families living with autism, fragile X and other neurodevelopmental disorders. Gifts of all sizes matter, and giving is easy. Donate online or by check.

Visit give.ucdavis.edu/MIND or contact Elizabeth McBride at 916-703-0221 or ekmcbride@ucdavis.edu.

Charitable IRA Rollover – a tax-saving way to help the UC Davis MIND Institute

The IRA Charitable Rollover allows individuals age 70½ and older to transfer up to \$100,000 annually from their IRA accounts directly to charity without first having to recognize the distribution as income.

Why consider this gift?

- Your gift will be put to use today, allowing you to see the difference your donation is making.
- You pay no income taxes on the gift. The transfer generates neither taxable income nor a tax deduction, so you benefit even if you do not itemize your deductions.
- If you have not yet taken your required minimum distribution for the year, your IRA charitable rollover gift can satisfy all or part of that requirement.



Elizabeth McBride
Director of Development
UC Davis MIND Institute

Grant to support research on adolescents with fragile X syndrome

The MIND Institute received a five-year, \$3.1 million grant from the National Institutes of Health (NIH) to research youth with fragile X syndrome (FXS) progressing from high school to adult life. The study, led by Leonard Abbeduto, MIND Institute director and professor of psychiatry and behavioral sciences, aims to better understand factors that lead to more or less successful transitions to independence.

“We think language and literacy skills upon completion of high school will play an important role in employment, socialization, leisure and housing outcomes for young adults with FXS,” said Abbeduto. “If we can demonstrate that relationship, I think we will have a strong case for schools to increase the intensity of speech and language therapies and literacy education.”

By identifying experiences in school and at home among adolescents with FXS, Abbeduto hopes to help parents and teachers of those with the disorder learn to facilitate successful transitions into adulthood. Additional UC Davis researchers include Angela John Thurman, Flora Tassone and Nicole Sparapani.

A gift from Lynda and Scott Canel and their family helped establish the Program for Transition into Adult Life and allowed Abbeduto to conduct the pilot research that helped secure the NIH grant.

Improving IQ test sensitivity



“This method basically uncovers the true variation in cognitive abilities and allows us to measure IQ more accurately in the low end.”

– David Hessl

Researchers from the MIND Institute’s Translational Psychophysiology and Assessment Laboratory (T-PAL) developed a method to improve IQ test sensitivity and remove barriers associated with floor effects in people with intellectual disabilities. The scoring eliminates floor effects, which occur when a large portion of examinees score at or near the measure’s lower limit for potential responses.

PRO-ED, Inc., publisher of one of the most widely used IQ tests, the Stanford-Binet Intelligence Scales, integrated the method into the web-based version of the test, which makes it possible for clinical psychologists, school psychologists and others who work with people with intellectual disabilities to use the method in their clinics and schools.

“This method basically uncovers the true variation in cognitive abilities and allows us to measure IQ more accurately in the low end and detect IQs below the usual floor,” said David Hessl, MIND Institute faculty member, professor in the Department of Psychiatry and Behavioral Sciences and T-PAL director. “We worked hard with PRO-ED, Inc. over the past few years to make this possible, and we are very excited that it is reaching the broader research, special education and clinical communities.”

Upcoming events

2018-2019 Distinguished Lecturer Series

SEPT. 12, 2018

Prenatal origins of health and vulnerability

Christopher Coe, Ph.D.
University of Wisconsin, Madison

OCT. 10, 2018

Neurodevelopmental risk factors for autism

Alan Brown, M.D., M.P.H.
Columbia University Medical Center

NOV. 14, 2018

Emotional lives of toddlers with ASD

Katarzyna Chawarska, Ph.D.
Yale University

DEC. 12, 2018

High quality language environments create high quality learning environments

Kathryn Hirsh-Pasek, Ph.D.
Temple University

JAN. 09, 2019

Expect more – an autism adventure

The Honorable Mike Lake, P.C., M.P.
Canadian House of Commons, and
Autism Advocate

All distinguished lectures are free in the MIND Institute auditorium and start at 4:30 p.m. and end by 6 p.m.

For the full schedule or more information, call 916-703-0253 or visit News & Events on the MIND Institute website.

2018-2019 Minds Behind the MIND lecture series

OCTOBER 3, 2018

Evidence-based/research-based practices: How to be a wise consumer of treatments and practices for ADHD and ASD

Julie Schweitzer, Ph.D.
Aubyn Stahmer, Ph.D.

JANUARY 16, 2019

Using EBPs in the Home and Community: Visual Supports

Amber Fitzgerald, M.A., B.C.B.A.

All Minds Behind the MIND lectures are free in the MIND Institute auditorium and start at 5:30 p.m. and end by 7 p.m.

Call 916-703-0336 or visit mindinstitute.ucdavis.edu/events/mindsbehindmind.html

Parent Support Groups

African American Developmental Disabilities Parent Advisory Group – meets monthly on the fourth Wednesday, from 6 to 8 p.m. For more information, call 916-703-0403, visit mindinstitute.ucdavis.edu/events, or email cjgrevious@ucdavis.edu.

Chinese American Developmental Disabilities Parent Support Group – members are active in a password-protected social media community through WeChat and periodically schedule face-to-face meetings based on member needs. Please contact April Qian at awqian@ucdavis.edu for more information or to join the group.

Apoyo de Padres para Padres (Parents Supporting Parents) – meets monthly on the first Tuesday, from 6 to 8 p.m. For more information, visit mindinstitute.ucdavis.edu/events or call 916-922-1490.



MCHC/RISE Up participants

Eleven undergraduates trained in public health leadership at the MIND Institute over the summer as part of the Maternal Child Health Careers/Research Initiatives for Student Enhancement – Undergraduate Summer Program (MCHC/RISE UP). For more information visit health.ucdavis.edu/mindinstitute/education/rise-up.



Family Time Back to School Event

NorCal Challengers donated \$2,000 during Family Time at the MIND Talent Showcase and Picnic on Aug. 30. The event brought together about 175 people for a back-to-school-themed picnic and talent show featuring dancers, singers and other musicians.

Going strong continued from front page

of experts and achieved international recognition as a leader in research and innovative approaches to treating a broad range of disorders, including autism spectrum disorder, fragile X syndrome, ADHD, 22q11.2 deletion syndrome and Down syndrome.

MIND Institute faculty members have helped identify the biological bases of neurodevelopmental disorders using animal models, discovered biomarkers for autism, and identified genetic and environmental factors that increase risk of autism and other disorders. They have elucidated the critical role of the immune system in

autism, tested pharmaceutical treatments, and developed and helped implement educational and behavioral interventions and innovative technologies to improve outcomes for children with autism and other neurodevelopmental diagnoses.

The MIND Institute's clinical enterprise has grown to include genomic medicine physicians, psychiatrists, developmental behavioral pediatricians, clinical psychologists, genetic counselors, social workers and behavior analysts. In 2017, the Institute's clinics had 6,100 patient visits for diagnosis, treatment, testing and parent education.

And because it was founded by parents, families continue to play an essential role in setting the MIND Institute's research priorities and helping scientists carry out that work through participation in research projects and clinical trials, among other activities.

Today the MIND Institute serves as a hub of activity for families, educators, researchers and the community. Together they are working to better understand and find the answers those founding families – and every parent with a child facing a neurodevelopmental diagnosis – are seeking.