

M.I.N.D. Matters



FALL 2007

Establishing a comprehensive ADHD research and treatment program

Using the latest brain imaging technology, Julie Schweitzer is revealing the inner workings of the brains of adults and children with ADHD – attention-deficit/hyperactivity disorder – a devastating condition that makes it difficult for children to maintain self-control and attention. Schweitzer’s groundbreaking research using fMRI (functional magnetic resonance imaging) indicates that when people with ADHD perform tasks, their brains show increased, non-localized brain activity when compared to those without the diagnosis.

“What we’ve seen is that more areas of the brain are involved,” said Schweitzer, an associate professor of psychiatry and behavioral sciences who arrived at the

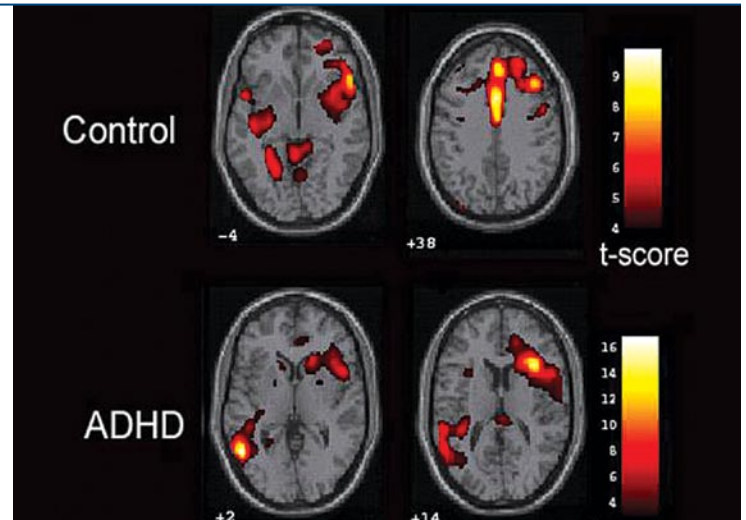
UC Davis M.I.N.D. Institute in January. “This less specific, inefficient activation means people with ADHD are working much harder to accomplish similar tasks.”

Schweitzer, who also has extensive clinical experience in treating patients with ADHD, will now

use her expertise to establish a comprehensive ADHD program at the M.I.N.D. Institute.

“This is the ideal place to build a program that can really make a difference, both in what we know about the biology behind ADHD and how we successfully treat those who have it,” said Schweitzer, who has studied ADHD and its treatments for 20 years. “You can’t find many places that have such strong clinical programs in childhood psychiatric disorders and a research infrastructure to work with those populations.”

For Schweitzer, who was previously at the University of Maryland and Emory University, building a far-reaching program means conducting research at many different



Functional magnetic resonance imaging (fMRI) is revealing information about brain regions and processes involved in attention deficits.

levels, including basic biological studies using brain imaging, clinical trials that test drug therapies and assessments of new behavioral interventions. It also means reaching out to local physicians and partnering with schools to raise awareness about symptoms and treatments for ADHD. Schweitzer said she is especially committed to assuring that the institute’s ADHD program addresses the needs of local schools.

“Classrooms are where children with ADHD are the most challenged. If they are not diagnosed and treated properly, the disorder can impact their ability to learn and, ultimately, their futures,” she said.

ADHD is the most common childhood psychiatric disorder, affecting 3 to 5 percent of school-aged children in the United

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“This is the ideal place to build a program that can really make a difference...”

– ADHD researcher
Julie Schweitzer

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ADHD research and treatment program *(from page 1)*

States. Children with the disorder usually have one of three types of ADHD (see below). In general, they often do poorly in school and have behavioral problems and poor relationships with others.

According to one parent, who prefers to remain anonymous, life with a child who has ADHD can be a roller-coaster ride of variable behaviors, phone calls from school principals, medication management and worry, especially when impulse control is low. “I never knew what to expect next, even when she was very young,” she said. “I picked my child up at preschool one day and was told she had 13 time outs.”

She is very enthusiastic about the new research program at the M.I.N.D. Institute, which she hopes will lead to better understanding. “Making ADHD a research priority gives the diagnosis greater status and helps take away some of the stigma for children who are affected and currently labeled as ‘uncontrollable’ rather than suffering from a real brain disorder. More research will also greatly improve the range of treatment options.”

According to Schweitzer, ADHD is a chronic condition with symptoms that usually persist throughout life. It is only now being recognized as one of the most common adult psychiatric disorders.

“Adults with the disorder may seem less hyperactive than when they were children, but, without treatment, they are still ‘running around’ inside their heads,” she explained. “They also have more traffic accidents, job instability and alcohol and drug abuse problems.”

Although the cause remains unknown, ADHD is often effectively treated using behavioral interventions and medication. At the M.I.N.D.

“Making ADHD a research priority gives the diagnosis greater status and helps take away some of the stigma for children who are affected...”

– parent of a child with ADHD

Institute, Schweitzer will be using her previous brain imaging studies to develop new behavioral treatments.

“Our brain imaging research suggests that children with ADHD may need a classroom curriculum that uses more visual cues,” Schweitzer said. She predicts her research will show that children may need explicit training on using more effective visual and verbal strategies for the classroom and home. Since most medications used to treat the disorder

only work for several hours, often without long-term benefits, it is important to find behavioral and environmental methods to treat ADHD.

“Ultimately, better medications and behavioral treatments are both needed,” she said.

According to Schweitzer, results from her studies are likely to inform the understanding, diagnosis and treatment of other psychiatric disorders, such as schizophrenia, in which those affected exhibit some symptoms similar to those diagnosed with ADHD.

For now, Schweitzer is excited about continuing her work, while exploring new directions in her research by collaborating with colleagues within the M.I.N.D. Institute and from other UC Davis departments.

“At UC Davis, you really get the sense that there is support throughout the system for the kind of collaborations that will move the science forward and allow us to translate those findings into clinical treatments more quickly,” she said.

What is ADHD?

ADHD is the most common childhood psychiatric disorder, affecting behavior and daily functioning in 3 to 5 percent of school-aged children in the United States.

Symptoms. Children may act quickly without thinking and interrupt others (impulsivity); fidget, have difficulty sitting still and have problems staying on task (hyperactivity); or daydream and get easily sidetracked (inattention).

Three types. ADHD is diagnosed as the hyperactive-impulsive type

(no significant inattention), inattentive type (no significant hyperactive-impulsive behavior) or the combined type (both inattentive and hyperactive-impulsive symptoms).

Other disorders. Children with ADHD can suffer from other psychological disorders, including depression, learning disorders, impulse control disorders and autism spectrum disorders. Adults may suffer from substance abuse.

Life-long management. ADHD is a chronic lifelong illness requiring long-term treatment strategies.

ADHD researcher brings her expertise to the M.I.N.D. Institute

M.I.N.D. Institute researcher Julie Schweitzer is not exaggerating when she says she had an early interest in autism. She was nine years old.

“I read a heartbreaking story in a magazine about parents whose affection for their child could not be acknowledged by that child,” recalled Schweitzer.

The story of that family stayed with Schweitzer as she was growing up in West Bloomfield, Mich. As a high school student, she volunteered at her local Jewish community center to work with children who had developmental disabilities. There she encountered a child who, while not diagnosed with autism, almost certainly had it.

“I remember him clearly,” said Schweitzer, who was 15 years old at the time. “He displayed poor eye contact and echolalia, or the involuntary repetition of words or phrases spoken by another person. He also had all the ritualized movements.”

By that time, the future pediatric psychologist had already received training in how to observe the behavior of others from an expert: her father, a private investigator. “He taught me early on how to observe people,” Schweitzer said.

Schweitzer entered Western Michigan University with the goal of learning behavioral analysis, then considered state-of-the-art treatment for autism. She continued her undergraduate studies and training at USC and UCLA, where she first began to learn about ADHD.

While in graduate school at the University of Massachusetts, Schweitzer became even more fascinated with ADHD and the combination of behavioral and biological interven-



Julie Schweitzer is establishing a new ADHD research program and clinic at the M.I.N.D. Institute.

Her ultimate goal is to combine genetic, brain imaging and behavioral data to develop interventions – or combinations of interventions – designed for specific subtypes of ADHD.

tions that could make an immediate difference in the lives of her patients.

“I loved working with children who had autism and learning about the behavioral interventions used to treat it,” said Schweitzer. “However, as I learned more about ADHD, I became fascinated by the biological approaches that were under way in treating the disorder

– sometimes successfully and sometimes not. I was very intrigued by the possibility of contributing more to that research.”

Schweitzer is now a recognized scholar in the field of fMRI research and what it can tell us about how the brains of people with ADHD work. At the M.I.N.D. Institute, she will combine that knowledge with biological and behavioral methods to better understand and treat ADHD. Her ultimate goal is to combine genetic, brain imaging and behavioral data to develop interventions – or combinations of interventions – designed for specific subtypes of ADHD.

“We now have the technology to image the brain in non-invasive ways, which has already given us a lot of information about how these children’s minds are working, things they cannot tell us themselves,” Schweitzer said. “In the near future, we will be able to apply that information to targeted treatment protocols based on how ADHD affects individuals.”

Summer Institute connects research with practice

It started when Randi Hagerman was planning her arrival at the UC Davis M.I.N.D. Institute in 2000. At the time, the institute was a brand-new center established to ensure collaboration across disciplines on autism research. Hagerman envisioned the quality and breadth of the institute's research program, then thought, "How are we going to get that information out to the people who need it the most right away?"

Seven years later, the two-day Summer Institute held each year in August attracts over 600 psychologists, speech and language pathologists, parents and educators interested in learning about interventions for autism and other neurodevelopmental disorders. Participants hear from M.I.N.D. Institute researchers and others conducting intriguing research around the nation. For one presenter, taking time away from her busy research clinic is well worth it.

"I've taught a few times at the institute, and what makes the

"Taking what is happening now in terms of cutting-edge practices and sharing them with professionals and parents who can use them fills a void in professional education in our field."

– Summer Institute chair John Brown

experience so unique and enjoyable for me are the participants," said Meryl Lipton, a physician and director of the Rush Neurobehavioral Center in Chicago. "They truly want to know how to help children learn better and live easier lives."

Lipton frequently corresponds with Summer Institute participants about her presentation on the treatment framework she developed for children

with high-functioning autism, ADHD, nonverbal learning disability and other disorders that can affect relationships and learning. Her intervention helps children recognize and manage emotions, care about others, make good decisions, develop positive relationships and avoid negative behaviors. Other institute presentations focused on overcoming memory and learning difficulties, building reading fluency skills, using assistive technology in the classroom and remediating language-processing deficits.

John Brown, who currently chairs the Summer Institute, links the primary benefit of the program to one of the founding principles of the M.I.N.D. Institute: collaboration.

"The coming together of research and practice is inspiring," said Brown, a psychologist and coordinator of outreach and training for the M.I.N.D. Institute. "Taking what is happening now in terms of cutting-edge practices and sharing them with professionals and parents who can use them fills a void in professional education in our field."

Maureen Burness, an assistant superintendent with Folsom Cordova Unified School District in Rancho Cordova, Calif., has attended all seven institutes because of its applicability in an educational environment.

"There is no better opportunity to learn current information specific to children with autism spectrum and other neurodevelopmental disorders that can be used in assessments, along with strategies that work well for children with special learning needs," she said.

Brown works with an advisory team of parents, educators and researchers who define each year's curriculum and speaker lineup. To be involved in next year's event, e-mail john.brown@ucdmc.ucdavis.edu.



The Summer Institute includes exhibits from service providers and advocacy groups. Above, developmental-behavioral pediatrician Robin Hansen (left) and early intervention consultant Gina Guarneri view the Family Resource Centers of Northern California booth.

Triumph sets a new standard in preschool education

The UC Davis M.I.N.D. Institute is proud to partner with St. HOPE Public Schools and the UC Davis School of Education to establish a new standard in preschool education. After four years of planning, the Triumph Center for Early Childhood Education opened its doors to 50 children on September 4.

Located about one mile from the M.I.N.D. Institute in Oak Park, Triumph combines quality preschool education with interventions based on the latest knowledge about learning and neurodevelopment. It is a full-inclusion preschool where students of all abilities are welcome and can be successful.

“Quality preschool is so critical to educational success throughout a child’s life,” said Cristin Fiorelli, preschool director. “We feel privileged to be working with the Oak Park community to ensure every child has access to an exceptional preschool.”

“This is an exciting opportunity to take what we know about how young minds develop and apply it to early education,” said Robert Hendren, executive director of the M.I.N.D. Institute. “Triumph students have the advantage of a learning environment based on the latest research on how to help kids learn and how to intervene early if a disability is suspected.”

Anyone who wants more information about Triumph or a tour should contact Fiorelli at (916) 731-8200 or cfiorelli@thetriumphcenter.org.



Prior to the preschool opening on September 4, Triumph teachers made sure the unique early education center was fully ready for its 50 new students.

Distinguished Lecturer Series begins October 10

Join us for another season of inspiration and ideas from prominent contributors to our understanding of autism and other neurodevelopmental disorders. Lectures are free, open to the public and held in the M.I.N.D. Institute auditorium. There are nine lectures in the 2007-08 series. Here are the first four:

October 10

Marco Iacoboni, M.D., Ph.D.

University of California, Los Angeles

4 p.m. – The Problem of Other Minds: Intersubjectivity and Mirror Neurons

6 p.m. – The Mirror Neuron Hypothesis of Autism

November 14

Karen F. Berman, M.D.

National Institute of Mental Health

4 p.m. – Translating Between Genes, Brain and Behavior with Neuroimaging: Neural Mechanisms in Schizophrenia and Williams Syndrome

6 p.m. – How Genes Work in the Brain: Lessons from Neuroimaging of Schizophrenia and Williams Syndrome

December 12

Annette Karmiloff-Smith, Ph.D., *University of London*

4 p.m. – Modules, Genes and Evolution: Lessons from Developmental Disorders

6 p.m. – Understanding Disorders of Mind and Brain in Children: The Necessity of a Developmental Perspective

January 9

Carlos A. Pardo, M.D., *Johns Hopkins University*

4 p.m. – Is Neuroimmunity Involved in the Pathogenesis of Autism?

6 p.m. – Is There Brain Inflammation in Autism?

For information about the entire lecturer series and to view recordings of past lectures, visit our Web site: www.mindinstitute.org.

The M.I.N.D. Institute extends special thanks to Mort and Marcy Friedman for their generous support of the series.

Private New Jersey foundation supports fragile X research

As much as UC Davis M.I.N.D. Institute researchers Randi and Paul Hagerman have advanced knowledge of fragile X syndrome during the past two decades, few people other than scientists, physicians and parents of affected children are familiar with the disorder. Many parents of children with fragile X syndrome seek help at the M.I.N.D. Institute. One remarkable set of parents, though, concluded that in order for the Hagermans to help them, they needed to help the Hagermans. Despite living nearly 3,000 miles away, Elissa and Eric Boory have generated hundreds of thousands of dollars to support the Hagermans' work.

The Boorys, of the New Jersey community of Cherry Hill, have established a private nonprofit foundation through which they have staged fundraising banquet and auction events in alternating years since 1999. They donate 100 percent of the proceeds to fragile X research.

"Unlike cancer or heart disease research programs, fragile X research attracts little attention or financial support because it's not as widely known," said Elissa Boory. "When we learned that the Hagermans sought funding to advance their studies, Eric and I decided to do something."

Fragile X syndrome can manifest itself in learning disabilities, delays in speech and language development, severe cognitive impairments and autism. Eric and Elissa Boory had not heard of the disorder until their second child, Seth, was diagnosed with it at 23 months of age. Seth had been pulling his hair out and did not respond appropriately to his parents' voices. The information they obtained from their pediatrician was incomplete and puzzling. Elissa learned about



The Boory family plans a biannual auction to raise crucial funding for fragile X research. Above (clockwise from left) are Eric, Alex, Elissa, Sydney and Seth, who has fragile X syndrome.

"The Boorys have worked extremely hard to support our efforts, essentially backing up their passion with research dollars."

— molecular geneticist
Paul Hagerman

research the Hagermans were conducting in Denver, where they worked at the time, and set up a meeting.

"When Eric and I first contacted the Hagerman team, we were frantic because we didn't understand anything about fragile X or its implications, and by then I had another newborn baby. They explained things to us very calmly, and reassured us that we were going to get through all this," said Elissa. During the visit, developmental-behavioral pediatrician Randi Hagerman performed

a clinical evaluation of Seth, and the Boorys talked with molecular geneticist Paul Hagerman about his research.

"Paul shared with us his visions and dreams about the potential treatments that could be achievable through further research," Eric said.

When the Boorys returned to New Jersey armed with the information they needed to proceed with their lives and properly nurture Seth, they established the Cure Fragile X Foundation and began planning their first fundraising event.

"We recognized that additional funding would enable Paul and Randi to hire more researchers and purchase needed equipment, so we decided to rally our community at home in a grassroots effort to raise money," explained Eric, a financial adviser with Morgan Stanley.

Elissa, who had been a Yellow Pages sales representative before raising a family, called upon her marketing talents to solicit donations from businesses. She secured airline tickets, ocean cruises,

(continued next page)

New Jersey foundation *(from page 6)*

hotel vouchers, Broadway theater tickets, dinners at elegant restaurants, tickets to sporting events and other enticing auction items. The Boorys rented a hall, hired an auctioneer and invited 400 friends, neighbors, relatives and members of their synagogue to attend.

The proceeds, totaling \$120,000, enabled Paul Hagerman to purchase an ABI 7700 Sequence Detector, which automated measurement of gene expression (RNA) levels. The device, upon which a plaque bearing Seth's name was mounted, became instru-

mental in numerous discoveries that have advanced understanding about the mechanisms underlying fragile X syndrome.

"The Boorys have worked extremely hard to support our efforts, essentially backing up their passion with research dollars. The funds allow us to perform critical experiments and identify abnormalities in the expression of the fragile X gene," explained Paul Hagerman. "Those experiments also played a pivotal role in our discovery of a new aging disorder,

FXTAS, associated with the fragile X gene."

Paul Hagerman notes that he sees the equipment he named for Seth every day. "Seth is a great kid. He encourages me to find the cure for fragile X," he said.

The Boorys' most recent auction, held this past May 6, raised \$160,000 for fragile X research, the majority of which will underwrite additional studies at the M.I.N.D. Institute's Fragile X Research and Treatment Center.

Thank you

to those who made the "Journey of the M.I.N.D." such a great success!

Our second annual gala was an evening of hope. Your support provides the critical funding necessary for finding effective treatments and eventual cures for autism, fragile X syndrome, Tourette's syndrome, ADHD, 22q11.2 deletion syndrome and other neurodevelopmental disorders.

Save the date –
next year's gala is

March 29, 2008

For more information about the UC Davis M.I.N.D. Institute and how you can help support our research efforts, please visit www.mindinstitute.org or call Terri Contenti at (916) 703-0289.



Everyone can help find a cure

The UC Davis M.I.N.D. Institute is closing in on answers to questions about neurodevelopmental disorders. You can help speed our progress.

Donations are crucial to the continuation of our efforts, and the holidays are the perfect time to consider year-end giving to the M.I.N.D. Institute. Here are a few ideas:

- Provide a financial gift on behalf of your staff or business colleagues
- Include the institute in your estate plans
- Give a gift of cash, stock, securities, real estate or other tangible personal property
- Contribute in honor of a loved one
- Donate to our special December celebration just for research study participants

For more information on how you can make the holiday season especially meaningful to children who live every day with the challenges of neurodevelopmental disorders, please contact Terri Contenti at (916) 703-0289.

Executive director's message



In this issue of M.I.N.D. Matters, I am thrilled to bring you news of the latest addition to our research program.

Julie Schweitzer, a recognized expert in ADHD, joined us this year and will soon launch fMRI and treatment studies at the M.I.N.D. Institute. We're very lucky to have Dr. Schweitzer on board. Combined with the Tourette's syndrome genetics study launched last year, the ADHD effort embodies our commitment to an expanding research program on neurodevelopmental disorders that has common themes and includes related disorders.

Also in this issue is news on a unique preschool. Four years ago, one of our board members and founding family members – Dr. Lou Vismara – brought me together with Kevin Johnson of St. HOPE Public Schools and Harold Levine of the UC Davis School of Education to address the need for first-rate, inclusion-based early childhood education in

Oak Park. Our role was to help ensure that the preschool curriculum and interventions were based on the latest understanding of brain development and learning. That effort led to the proud moment when the Triumph center opened its doors to 50 youngsters on the morning of September 4.

Since our last issue of M.I.N.D. Matters, two research teams have had remarkable funding successes that I'd like to share with you as well.

Our partners in autism science at the UC Davis Center for Children's Environmental Health, led by Isaac Pessah and Irva Hertz-Picciotto, received funding renewals totaling \$7.5 million from the NIEHS and the U.S. EPA. The funding supports continuation of the CHARGE (Childhood Autism Risks from Genetics and the Environment) study and launches the new MARBLES (Markers of Autism Risk in Babies – Learning Early Signs) study. Among many interesting CHARGE findings so far is the discovery of immune system distinctions in children with autism. MARBLES will pinpoint when and how the biology of autism unfolds, along with the environmental exposures that could be responsible for those changes, by tracking development from pregnancy

through the point in time when autism is diagnosed.

More recently, two Fragile X Research and Treatment Center investigators – Paul Hagerman and Randi Hagerman – received nearly \$21.8 million from the NIH to launch the NeuroTherapeutics Research Institute. The new institute will define the molecular features of, and then identify treatments for, FXTAS (fragile X-associated tremor/ataxia syndrome). This disorder causes disabling tremors, balance problems and eventual cognitive decline for some men and women over the age of 50 who are carriers of the genetic mutation that causes fragile X syndrome, which is the most common cause of inherited mental impairment in children. The NIH grant is the largest in history for FXTAS or any other fragile-X related disorder.

Congratulations to our research teams and collaborators who are finding answers to questions about autism and other neurodevelopmental disorders. We expect groundbreaking outcomes from all of them and will be sure to let you know of their progress.

*Robert L. Hendren, D.O.
Executive Director
UC Davis M.I.N.D. Institute*

M.I.N.D. Matters

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