Irva Hertz-Picciotto: Searching for clues to autism’s increase

We’ve all read the headlines about diagnosed cases of autism being on the rise, and we’ve wondered: Why? Could it be due to a broadening of diagnostic criteria for autism? Is greater awareness on the part of parents leading to earlier diagnoses?

Trying to answer such questions takes one into the realm of epidemiology, the study of causes, incidence, and characteristic behaviors of disease outbreaks affecting human populations. M.I.N.D. Institute researcher Irva Hertz-Picciotto, a professor in the Department of Public Health Sciences, chief of environmental and occupational health in the UC Davis School of Medicine and an internationally recognized epidemiologist, is at the forefront of these efforts.

“My ultimate hope is to find environmental factors that we can either remove from the environment through regulatory policy or limit an individual’s exposure by changing personal behaviors, thereby helping to prevent future cases of autism,” Hertz-Picciotto said.

In January, Hertz-Picciotto and co-author Lora Delwiche of the UC Davis Department of Public Health Sciences published a paper in the influential journal Epidemiology, which found that the seven-fold increase in the number of children born in California with autism since 1990 cannot be fully explained by changes in how the condition is defined or counted.

Broadening of diagnostic criteria and younger age at diagnosis don’t explain even half of the huge increases in California cases. The incidence of autism by age 5 in California has increased from slightly over 6 in 10,000 for children born in 1990 to more than 42 in 10,000 for children born in 2001. The study’s

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methodology revealed that no more than 56 percent of the estimated 600-to-700 percent increase – less than one-tenth of the increased rate of reported autism cases – could be attributed to the inclusion of milder cases of autism, and only 24 percent of the increase could be attributed to earlier age at diagnosis. Another 120 percent may have occurred due to the changes in diagnostic criteria.

In-migration to California – as the population swelled through the last few decades (it’s now trending downward) – was controlled in this analysis by exclusion of children born outside the state. In short, the answer is, ‘yes,’ autism incidence has increased, even when all of the other possibilities have been accounted for – and the increase shows no sign of abating, Hertz-Picciotto said.

“As we pare away, one by one, the various potential artifactual causes of the increase in autism, only about one-third of the increase can be explained,” Hertz-Picciotto said in a recent interview.

Hertz-Picciotto, who has published widely on environmental exposure, including exposures to metals, pesticides, polychlorinated biphenyls (PCBs) and air pollution and their effects on child health and development, argues that more effort should be put into looking for environmental factors that might cause autism, particularly in genetically susceptible children. Although it’s not yet possible to determine how much of the increase is a true increase, a serious and careful look at environmental exposures is warranted. “Genetics doesn’t explain it all, even in twins,” said Hertz-Picciotto.

The study’s methodology involved analyzing data collected by the state of California Department of Developmental Services (DDS) from 1990 to 2006, as well as the United States Census Bureau and state of California Department of Public Health Office of Vital Records, which compiles and maintains birth statistics. The researchers correlated the number of cases of full autism reported between 1990 and 2006 with birth records and excluded children not born in California. They used Census Bureau data to calculate the rate of incidence in the population over time and examined the age at diagnosis of all children ages 2 to 10 years old.

Hertz-Picciotto, who serves as deputy director of the Center for Children’s Environmental Health at UC Davis, now turns her attention to two studies looking specifically at the relationship between environmental exposures and the incidence of autism.

CHARGE, short for Childhood Autism Risks from Genetics and the Environment, was launched in 2004 as the largest epidemiological study of environmental contributions to confirmed autism cases. It’s also the first major investigation of environmental chemicals and how they interact with genes in the disorder. A case-control study of 2,000 children with differing patterns of development, it characterizes children with autism into subgroups to determine whether particular genes and/or environmental exposures are associated with certain subtypes of this condition.

MARBLES (Markers of Autism Risk in Babies-Learning Early Signs) is a prospective investigation that follows women who already have had one child with autism, beginning early in or even before a subsequent pregnancy, to search for early exposures, maternal conditions and biochemical or other markers that might predict autism in the younger sibling.

Taken together, these studies epitomize the M.I.N.D. Institute’s broad based and holistic approach to uncovering the various risk factors and causes for autism and the many other neurodevelopmental disorders that affect an increasingly larger number of our children.
Blythe Corbett: Autism basic science and intervention through art

Blythe Corbett’s insights may be unique among researchers developing new interventions for children with autism spectrum disorders – at the M.I.N.D. Institute or elsewhere. Corbett’s Social Emotional NeuroScience Endocrinology (SENSE) lab focuses chiefly on analysis of the behavioral and biological effects of the stress hormone cortisol on children with autism. But her work is informed by the eclectic professional experience of someone with a background in autism diagnosis, brain analysis, behavioral intervention – and acting.

“Results from my studies are revealing associations between a child’s behavior, biological profile and brain functioning before, during and after social interactions,” said Corbett, an assistant professor of clinical psychiatry in the Department of Psychiatry and Behavioral Sciences. “The ultimate hope is that these results will give us a better understanding of autism in order to develop individualized biological and behavioral treatments.”

In her quest for enhanced assessment and treatment of the social-emotional capabilities of children with autism, Corbett has focused on responses of the stress hormone cortisol during various potentially stressful settings, including playground interactions. With playtime periods discreetly videotaped for later moment-by-moment documentation of their behavior, a child with autism and a typically developing child are teamed with a “confederate” child who works with the researchers. They’re given various play opportunities, with their cortisol levels checked before and afterwards to assess their level of stress.

“Although there is a great deal of variability in stress levels among children with autism, many of our subjects seem to find playground interactions stressful—even kids who appear to be enjoying themselves,” explains Corbett.

Her cortisol studies have also revealed that children with autism often have elevated cortisol levels toward the end of the day, in contrast to typically developing children. These studies of cortisol rhythms and responses raise many questions: Do those with autism have heightened sensory sensitivity, leading to heightened stress? Do they have a genetic predisposition to stress? What are the characteristics of the children who show high versus low levels of stress?

“Research is ongoing in my lab to answer these questions,” Corbett said. “It’s clear that understanding the biology beyond the behaviors can help lead directly to new, more effective interventions for our kids with autism, a priority for so many of us in this field.”
Sense Theatre: Giving kids with autism a chance to shine

On the evening of February 6, 16-year-old Esteban Marchant received a thunderous, standing ovation with his rendition of Elton John’s *Your Song* at a heart-warming benefi t marking the founding of the SENSE Theatre. The response from the more than 200 audience members was all the more remarkable in light of Esteban’s personal story. Orphaned at age 7, unable to talk and exhibiting the unruly behavior often associated with autism, he was adopted by his aunt and uncle and was enrolled in a variety of M.I.N.D. Institute programs. His singing performance showed how very far he’s come in just nine years. That’s the kind of success story that is likely to be repeated many times over through the newly launched SENSE Theatre, also known as a Stage of Hope for Children with Autism. A non-profit experimental project designed to improve the social and emotional functioning of children with autism and related neurodevelopmental disorders, it provides these youngsters with unique opportunities to perform side by side with typically developing actors.

The effort is based on co-founder Blythe Corbett’s research and clinical work. The project’s other co-founders are clinical psychologist Joan Gunther, Psy.D., and autism activist and M.I.N.D. Institute Board Member Christine Totah, whose son, Alex, was among the more than 25 variety show performers. “[Alex] felt that overwhelming sense of accomplishment,” Totah was quoted as saying about her son’s participation in the performance in an article in the California Aggie newspaper.

The benefit performance was held at the Davis Musical Theatre Company, the group’s community partner. A featured singer was Broadway actor Franc D’Ambrosio, known as “the Longest-Running Phantom” for his record-breaking number of performances in touring productions of “Phantom of the Opera.” He performed a show-stopping medley of songs from “Oklahoma!” and “Phantom,” along with a poignant closing song, *High Hopes*, performed with the SENSE Theater Youth Ensemble.

“It’s an honor to be a part of a program that gives children with autism an opportunity to develop their social-emotional skills and at the same time participate in an event that will give them a sense of camaraderie and personal achievement,” Joan Gunther said. “In addition, the program offers typically developing children an opportunity to broaden their view of the world and offer assistance and empathy to others.”

The young participants will all be cast in a series of SENSE Theatre musicals to be performed for the public, starting with Disney’s “The Jungle Book” in June. For details go to: www.SENSETheatre.com.

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Corbett has drawn on her acting background to found a new all-volunteer theatrical intervention program, the SENSE Theatre, which teams typically developing children with child actors with autism to perform musicals and plays for live audiences. Acting provides a natural environment for children with developmental disabilities to better understand emotional expression, learn scripts for typical conversations, have a safe place for repeating those scripts and for developing friendships with peers their own age – and feel the sense of pride that comes from receiving applause from an appreciative audience.

The project also helps develop the concept of video modeling, a tool that allows children with autism learn the behaviors of typically developing children by seeing them on video and repeating their behaviors. SENSE Theatre productions utilize youth actors as expert models who, as part of the rehearsal process, perform the roles in which the children with autism have been cast. In addition to working with the child during the rehearsals, these typically developing actors are videotaped in rehearsal performing the roles, and the children with autism are encouraged to study those videos from home. For performances, the typically developing actors are cast in different roles, giving them the chance to shine in front of audiences, too.
At the entrance to the M.I.N.D. Institute is a six-foot-long, five-foot-tall wall of glass, etched with images of children with autism, the M.I.N.D. Institute mission and the names of those who have generously contributed to finding treatments or cures for neurodevelopmental disorders.

Fred Reed’s name is among them. Reed passed away at age 67 in May of 2007 after a battle with kidney cancer. At his death, Reed and his family decided that, in lieu of flowers or other memorials, they would request that gifts be made to the M.I.N.D. Institute in Fred’s honor.

Sally Reed, who lives in the family home in Carmel and her late husband have a grandson with autism. Six year old Cyrus lives with their daughter Liz Feycbakhsh, her husband Tino and sister Lilia, 8, in San Diego. Fred Reed’s friends and family rallied around the cause to make a significant contribution to the M.I.N.D. Institute in Fred’s honor.

“He was just one of those people who, when he made a friend, kept them forever,” Sally Reed recalled. “There was nothing more important to Fred than his friends. Even if he had made a friend 40 years ago, he would stay in touch,” she said.

One of those friends, David Higgins, a golfing buddy of Fred’s, introduced the Reeds to the M.I.N.D. Institute and suggested that, in lieu of flowers, memorial gifts be sent to the M.I.N.D. Institute.

Sally remembered that those gifts poured in from around the country, including Texas, Tennessee, and throughout California, a testament to the steadfastness of Fred’s friendships and the family’s love of their grandson.

Sally Reed and her family visited the M.I.N.D. Institute over the winter holidays, to see and touch the line on the glass wall that says “Friends of Fred Reed,” and to see the place that gives hope to families of children with autism everywhere. “Fred was just a great friend,” Sally said.

“Our grandson Cyrus has added so much value to our lives. We know that there’s a great deal inside him and all of these kids,” Sally said of her grandson. “We’re holding out a lot of hope for him and for all of them — and for all the research.”

Individuals wishing to make memorial gifts to the M.I.N.D. Institute should contact Terri Contenti, community relations officer, (916) 703-0289.
About a dozen teens with social-communication disorders sit in a tight circle, cradled in couches and chairs in a conference room at the UC Davis M.I.N.D. Institute. They listen intently as Marjorie Solomon, the leader of the Institute’s social skills training program, guides them in a discussion of what it means to have and be a friend.

“What makes you trust another person?” Solomon asks. “Do you make friends easily?” … “Do you pick friends who are similar to you?” she asks.

The answers spill out, sometimes freely, sometimes with more coaxing.

“I trust other people when I know they can keep a secret,” one participant volunteers. “Someone who will help me out in a jam,” another says. “Someone who will stick by me over time,” offers another.

For these young people, the answers to such questions don’t come easily. They are diagnosed with high-functioning autism, Asperger syndrome and other neurodevelopmental conditions characterized by difficulties with verbal and non-verbal communication and forming social relationships.

Solomon’s program is intended to help them bridge these gaps. Her work grew from a seed planted while she was a postdoctoral student and M.I.N.D. Institute Scholar, between 2000 and 2003. In a paper published in the Journal of Autism and Developmental Disorders in 2004, Solomon and two co-authors reported that it’s possible to teach facial expression recognition and problem-solving skills to high-functioning children with autism in a group setting.

“It is very difficult to measure social skills improvement in a real-world way. It was gratifying that we documented small gains in face processing and problem solving, but we realized this didn’t capture all the positive results parents and group leaders were observing,” Solomon said in an interview recently. “Improved self-esteem, social self-confidence, and social motivation also seemed to result from the experience of being in a group, and we believe that this may have a longer term positive impact on social development than training discrete skills.”

In a subsequent study funded by the UC Davis Children’s Miracle Network, the research team also was able to preliminarily assess the contributions of a more structured parent training intervention known as Parent Child Interaction Therapy (PCIT). This study found that PCIT produced significant reductions in children’s problem behavior as reported by their parents, and significant improvements in the quality of the parent-child relationship.

The M.I.N.D. Institute social skills program now offers 30 weekly meetings that include groups for...
Profile: Marjorie Solomon

As a young woman growing up in New York, the last thing that Marjorie Solomon wanted to do was follow in her parents' professional footsteps. Solomon's father is a Yale-trained psychiatrist and her mother is a clinical social worker.

"As a young person growing up I wanted to get as far away from that as I possibly could," Solomon recalled.

But, even as a teen, Solomon had enough personal insight to know that she had strong organizational and leadership skills, and the clinical intuition that comes from being raised by mental health professionals. Those qualities, she decided, would make her a successful international business woman working in diverse cultures.

"I decided I would pursue a master's in business administration (MBA). I attended the Stanford Graduate School of Business, and then accepted a position as an investment banker at Morgan Stanley, where I did tax-exempt finance analysis for hospitals and retirement centers." After several years Solomon was recruited to work at a health care consulting firm, where she utilized a broader range of skills including strategic planning, market research, and valuation analysis for biotechnology and other health-care-related businesses.

"I still felt that something was missing. I was working extremely hard, and was very successful, but I wasn't solving problems that were personally meaningful, and I didn't really feel that I was helping people," said Solomon, who is now an assistant professor in the Department of Psychiatry and Behavioral Sciences, a researcher at the UC Davis M.I.N.D. Institute and at the Imaging Research Center.

After the birth of her first son, Solomon decided to pursue a plan that had been quietly evolving inside her. She had always thought that completing a doctorate in psychology would help her move closer to the career she wanted. In 1999, she achieved her goal when she was awarded her PhD in Psychology from the University of California, Berkeley, and returned to Davis for a clinical rotation in the Department of Family and Community Medicine.

It was around that time that she began to notice that her young son was developing atypically.

"He was extremely verbal. He learned to talk so early. He could read over 100 words before he was 2. He also could tell you the make and model of every car in any parking lot. We just thought that we had the most brilliantly gifted child on our hands," she said.

Though her son is extremely intellectually gifted (he is now attending a prestigious university), Solomon would later learn that he has a non-verbal learning disorder. While exceptionally bright, he has difficulty with the non-verbal aspects of communication and abstract reasoning.

“We don't have a good, integrated explanation for all of the things that are going on with these kids... That's what gets me up in the morning.”

– Marjorie Solomon

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teens and younger children. There is a 50-family waiting list. To date, more than 100 children and adolescents have “graduated” from the program, and services have also been provided for approximately 40 of their siblings and 150 of their parents.

Ultimately, Solomon hopes to help these young people learn what comes naturally to most typically developing children – forming relationships with peers, thereby laying the critical groundwork for later success in higher education, employment and ultimately, life as independent adults.

“College is usually more predictable and structured than the workplace and emphasizes things that high-functioning people with autism spectrum disorders are good at, such as reading, memorization, persistence, and a knack for technical topics,” Solomon said. “Young people with autism spectrum disorders also come to college with lots of experience being students.”

“One the other hand, success in most jobs depends on the ability to participate in teams and to understand complex social interactions with co-workers,” Solomon noted. “Workers also are expected to learn things from experience on the job and then to generalize them to other similar situations. These things can be very difficult for individuals with autism spectrum disorders.”

But for now, what does learning the skills to be successful in adulthood look like? It looks like game-time with the social skills group – throwing a football around on the M.I.N.D. Institute’s grounds, playing a game of Jenga, discussing what real friendship is like, or completing a homework assignment on walking in another person’s shoes.

It also looks like a parent group, where mothers and fathers sit around a large conference table, discussing what their children are learning, along with the topic of stress and anxiety, which they have identified as a big problem for their children.

And, down the hall, the siblings of the children with autism have their own group to hang out and bond with through a multitude of supervised activities.

“I’m very much my father’s daughter,” Solomon said. “My father was a psychiatrist through and through. He was fascinated by trying to understand what makes people tick from both a biological and a behavioral perspective. I guess we are pretty similar.”

In addition to her professional work, Solomon has been an active advocate on both the state and local levels for persons with neurodevelopmental disorders and the mentally ill. She has served as the president of the board of directors of Jewish Family Services, a trustee of the Schwab-Rosenhouse Memorial Foundation, a board member of Families First, and a member of PRIDE Industries’ Integrated Autism Advisory Committee.

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It was Solomon’s experiences with her son that would initially channel her research interests into social interventions for higher-functioning children and youth with autism. She was one of the first recipients of a M.I.N.D. Institute Scholars Award, a fellowship that helped her establish the social skills training program at the M.I.N.D. Institute, with her colleague, Beth Goodlin-Jones. The program has been in operation since that time, and has provided services for close to 200 children and families.

Nearly 10 years later, Solomon’s research has evolved to encompass cognitive neuroscience studies using functional neuroimaging that are designed to determine how brain function relates to behavior. She hopes that identifying the sources of cognitive dysfunction will lead to pharmacological and psychosocial treatments for behavior, like the highly circumscribed interests of high-functioning people with autism.

“We don’t have a good, integrated explanation for all of the things that are going on with these kids,” Solomon said. “It is like a massive puzzle. That’s what gets me up in the morning. I want to figure out what is going wrong for my patients, and how we can better help them.”

Looking back on her career, what has she learned about herself?
We’ve asked our Editorial Board Members to identify particularly important research findings from the last two years. Here is a sample of their selections published during 2007/2008.

“Modeling longitudinal change in the language abilities of children with autism: parent behaviors and child characteristics as predictors of change.” — Developmental Psychology 44:1691-1704. Siller, M., Sigman, M.; University of California, Los Angeles

This study found that the way parents interact with their young children with autism influences their language development during at least the first decade of life. The findings highlight the unique impact of social interactions on development and illustrate that the language development of children with autism responds to exactly the same type of parental inputs that occur in typical development. Adults who are sensitive to both children’s communications, verbal and nonverbal, and where they focus their attention, and who follow their leads, most benefit their children’s language development.


The findings of this study show that amyloid precursor protein (APP), a possible contributor to the onset of Alzheimer’s disease, functions as a receptor for another molecule called TAG1, which has been implicated in brain development. When APP and TAG1 interact, cell division is turned off in the developing brain. This article suggests that over expression of APP decreases neurogenesis, contributing to neurodegeneration, and raising the possibility that a deficiency of APP might increase abnormal neurogenesis and contribute to the enlarged brains seen in some neurodevelopmental diseases.


This study used a genetic approach called “homozygosity mapping” to evaluate the DNA of the parents of children with autism who have common ancestors. Several chromosomal locations with large inherited deletions that contain genes involved in neuronal activity and learning were found. The study findings suggest that defective gene expression that alters neural activity may be a common mechanism in the seemingly diverse genetic defects that lead to autism. This study highlights the
Groundbreaking research
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use of a new and efficient technique that might overcome previous difficulties in identifying autism genes, and lead to better understanding of autism causes, more effective psychopharmacological treatments and improved genetic counseling for at risk families.


Fragile X syndrome (FXS) is the most common form of heritable mental retardation and the leading identified cause of autism. FXS is known to be caused by silencing the FMR1 gene that leads to reduced production of fragile X mental retardation protein (FMRP). How this leads to intellectual and psychiatric dysfunction is not known, but one theory is that many symptoms of FXS result from hyper-activation of a brain receptor called mGluR5. To test this idea, the authors generated genetically modified mice that had silencing of the FMR1 gene AND a 50 percent reduction in mGluR5r gene function. These mice showed far less impairments than mice with 100 percent of the mGluR5 receptor. These results demonstrate that mGluR5 contributes significantly to the cause of fragile X and suggests that modulating mGluR5 might be an effective therapy for FXS.


In this research conducted at the M.I.N.D. Institute, investigators determined that about 12 percent of women who have multiple children with autism have a unique pattern of auto-antibodies directed at the fetal human brain. This raised the possibility that these antibodies, which can cross the placenta, may interact with the developing brain and perhaps increase the risk of autism. Evidence for this was obtained in the second study, in which these antibodies were purified from blood samples from mothers of children with autism and injected into pregnant monkeys. The offspring of the monkeys demonstrated an increase in repetitive behaviors, or stereotypies, that are typical in autism. This is important because it points to one potential cause of autism and also raises the prospect of a diagnostic tool for the detection of risk factors prior to pregnancy.


For this study, scientists developed a computer model to analyze functional magnetic imaging (fMRI) analyses of real-time brain activity generated when people looked at thousands of random pictures. They were able to predict, with a very high degree of accuracy, which picture the partici-


The authors examine self and other cognitions in individuals with autism and typical development using neuroimaging. They use three tasks that involve thinking about oneself in solitary action and in the context of a trust game previously used successfully in social psychology. The study focused on activations of a brain region known as the anterior cingulate cortex which has been implicated in human emotion and social cognition. Individuals with autism failed to show the same neural activation patterns associated with integration and experience of self-related perceptions as typical adults. This is another finding of reduced information processing integration in autism that could underlie some of the disorder’s characteristic deficits. This study also is important because it illustrates the benefits of merging social psychology and neuroimaging in the study of autism.
In June, after nearly eight years, Robert Hendren will leave his post as the executive director of the M.I.N.D. Institute to become the director of the division of child and adolescent psychiatry and the vice chair of the Department of Psychiatry at the University of California, San Francisco. He reflected recently on his tenure – and on how he hopes to continue his relationship with the Institute.

Q: “What are you most proud of during your time at the M.I.N.D. Institute?”

A: “I am very proud of completing our initial building project in such a timely manner. When I arrived in fall 2001, ground was just being broken for the buildings. Remarkably we were able to move in by summer 2003. I am also extremely proud of the outstanding people who have joined the Institute during my tenure, including most of the basic scientists and clinical researchers. And, I am equally pleased to have helped engender an environment at the M.I.N.D. Institute that encourages collaboration, helps people work together well, and provides a fertile ground for research and innovation.

Q: “What have you enjoyed most about being at the M.I.N.D.?”

A: Rather than focusing primarily on diagnosis or diagnostic criteria, I have been excited about the emphasis that M.I.N.D. Institute researchers place on the process of neurodevelopment in the disorders we study. I think that, at least for autism, the current diagnostic criteria are going to become less meaningful, as we better understand the subtypes of autism. I have also enjoyed the excitement of sharing expertise among people from a variety of backgrounds as our collaborations lead us to understand the complex process of neurodevelopment and how we might intervene when this process is not going in a healthy direction.

Q: “What has inspired you most about being at the M.I.N.D.?”

A: The parents, and in particular the founding families, continue to inspire me each day. They make sure we do not get too caught up in looking into questions that seem interesting, but are ultimately not important for finding the mechanisms or effective treatments or cures for these disorders. Chuck Gardner, one of our founding fathers, once told me “Every time you face a decision at the M.I.N.D. Institute, ask yourself, ‘Is this going to help find a cure for autism?’ If the answer is ‘no,’ then, don’t do it.” The parents inspire us to care deeply about children with neurodevelopmental disorders, so that we are driven by more than scientific curiosity.

Q: “How do you see the M.I.N.D. Institute’s growth in the future?”

A: A unique focus of the M.I.N.D. Institute is examining gene-environment interactions, especially those mediated by the immune system, as potential mechanisms for disordering neurodevelopment. The M.I.N.D. Institute is one of the earliest and strongest leaders to pursue this approach and other related mechanisms, as well as targeted treatments to prevent or reverse neurodevelopmental disorders. I see this as one of the most important areas for future study, as we seek more effective treatments and ultimately cures for these conditions. Understanding neurodevelopmental mechanisms is relevant to many mental disorders. There is a neurodevelopmental component in bipolar disorder, schizophrenia, and attention-deficit hyperactivity disorder. Researchers throughout the world will learn a lot more about neurodevelopmental disorders – including autism – using the model we have developed at the M.I.N.D. Institute.

Q: Do you see opportunities for collaborations with the M.I.N.D. Institute in the future?

A: Absolutely! Collaborations among UC Davis, UCSF and Stanford – and potentially other University of California campuses – could help us pull together an even broader research and clinical team that would be a “win-win” for everyone – especially people with neurodevelopmental disorders and their families. I look forward to collaborating with the M.I.N.D. Institute in my own research into autism and other related neurodevelopmental disorders.

Q: Any final thoughts?

A: I especially want to thank the staff, our patients and their families, and other supporters for their tireless efforts in seeking treatments and potential cures for these disorders. They have paved the way for future generations. It has been an honor and privilege to lead the M.I.N.D. Institute.
In science you never try to change more than one thing at a time in an experiment. But, with this Spring/Summer 2009 issue of M.I.N.D. Matters, we’ve changed almost everything. We’ve developed a more visually interesting format and design that we hope will peak the curiosity of you, the reader. We’ve also launched a series of articles, such as “Groundbreaking Neurodevelopmental Research of 2007/2008,” that will highlight exciting research from all over the world; and formed an Editorial Board that will guide decisions on content and scientific accuracy and ensure that this newsletter continues to highlight the exciting research being conducted at the M.I.N.D. Institute. We hope that you enjoy these changes. If you do, or even if you don’t, we would appreciate your comments. Please feel free to e-mail me at dgamaral@ucdavis.edu with comments, criticism or suggestions for other changes.

– David G. Amaral, Ph.D.
Director of Research
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