



Contact: Rubenstein Communications, Inc.
Adam Pockriss - apockriss@rubenstein.com/212.843.8286
Julia Tomkins - jtomkins@rubenstein.com/212.843.9223

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AUTISM SCIENCE FOUNDATION ANNOUNCES SPRING 2016 GRANT RECIPIENTS FOR PRE- AND POST-DOCTORAL FELLOWSHIPS AND UNDERGRADUATE SUMMER RESEARCH

Fifteen Early Career Scientists to be Funded

NEW YORK, NY (April 5, 2016) - The Autism Science Foundation, a not-for-profit organization dedicated to funding innovative autism research, today announced the recipients of its annual pre- and post-doctoral fellowship programs and undergraduate summer research grants. Four post-doctoral and five pre-doctoral fellowship grants will be awarded to student and mentor teams conducting research in gene and environmental interactions, head size, sensory abnormalities, neurobiology, and sex differences in ASD. Six grants will be awarded to highly-accomplished undergraduate student-mentor teams conducting research in brain function, neurobiology, sleeping behaviors, and social communication in autism.

“The autism community has demanded more research to understand what is causing autism and to develop better treatments. ASF attracts outstanding applicants, representing a broad range of perspectives on autism science,” said Autism Science Foundation President Alison Singer. “In addition to funding novel and innovative research that will impact the scientific landscape, these awards make important investments in young investigators starting their careers in autism research. We are proud to mark Autism Awareness Month by increasing our research funding in response to this national health crisis.”

The Rett Syndrome Research Trust (RSRT) has co-funded the pre-doctoral fellowship awarded to Spencer Moore of University of California at San Diego. Moore’s research will examine the role of a molecule in the brain called IL6 that is elevated following immune challenges associated with autism risk. Girls with Rett Syndrome have several similarities to girls with autism, including the feature of regression. This study will look at the role of IL6 in the brain in both an animal model of Rett and in cells from people with Rett; it will help to more fully characterize the contribution of astrocytes and the role of immune molecules in neurodevelopmental disorders.

“I am delighted that the Rett Syndrome Research Trust and the Autism Science Foundation are collaboratively supporting the work of Spencer Moore, a creative, young investigator,” said Monica Coenraads, executive director of RSRT. “His work will be conducted in Alysson Muotri’s UCSD laboratory, which has a longstanding interest in both Rett Syndrome and autism spectrum disorder. I look forward to the data generated from this research project and appreciate the opportunity to partner with ASF.”

Since its founding in 2009, the Autism Science Foundation has funded more than \$2.3 million in grants, including pre- and post-doctoral fellowships, medical school gap year research fellowships, three-year early career awards, treatment grants, undergraduate summer research grants, research enhancement mini-grants, and travel scholarships to enable stakeholders to attend the annual International Meeting for Autism Research (IMFAR).

The following projects were selected for 2016 funding:

Autism Science Foundation's Post-Doctoral Fellowship Grant Recipients

Tom Cariveau, (Ph.D. expected June 2016), Emory University

Mentor: Lawrence Scahill, MSN, PhD

A new treatment for minimally verbal girls with ASD

Fewer females than males are diagnosed with autism spectrum disorder (ASD), and fewer females have been enrolled in treatment studies. As a result, it is not clear if commonly used interventions are equally effective for females. This study will examine the feasibility and preliminary efficacy of Social Engagement Therapy (SET) in a sample of minimally verbal girls with ASD. SET is a brief, structured behavioral intervention, based on applied behavior analysis, and is designed to increase social communication and social approach in minimally-verbal children with ASD. The study will also explore the use of a new wearable technology worn by the therapist to examine orientation to social stimuli.

Aarti Nair, Ph.D., University of California at Los Angeles

Mentor: Susan Y. Bookheimer, PhD

Brain changes following social skills treatment in adolescents with ASD

This research will combine neuroimaging technology and more sophisticated measures of treatment outcome to directly study how a social-communication intervention affects the brain. This study will identify markers of brain activity that will predict how different people respond to treatment to ensure that everyone with ASD has the best opportunity for a favorable outcome. The proposed study will attempt to show the importance of neuroimaging as a biomarker of treatment efficacy and a predictor of treatment outcome. The findings would not only potentially have direct clinical implications, but also impact the field of ASD research by highlighting new clinically relevant uses of neuroimaging methods.

Tychele Turner, Ph.D., University of Washington

Mentor: Evan Eichler, PhD

Origins of genetic causes of autism

One of the major discoveries in the identification of genes associated with autism are ‘de novo’ mutations, or those not found in either parent. However, there are also cases of autism where a mutation is passed from a non-affected parent that results in autism in the child. Recent work by Dr. Turner has shown specific genes coming from the mother are present in boys, but not girls, with ASD. This study will go on to identify those specific genes that are transmitted from a parent and describe features in the children with autism who inherited them to see if there is any sort of behavioral difference. Then these genes will be sequenced so they can be studied further by this and other laboratories. This will ultimately help clinicians understand some of the differences in males and females with autism and possibly lead to individualized treatment targets.

Donna M. Werling, Ph.D., University of California at San Francisco

Mentor: Stephan J. Sanders, BMBS, PhD

The genetics of male sensitization and female protection in ASD

Despite the lower prevalence in autism diagnosis of females compared to males, genetic studies show that affected females are more likely to have harmful mutations in their genome. This suggests that females are in some way protected against autism. However, the role of certain genes in sensitizing males to a diagnosis cannot be ruled out. In order to study these two ideas further, this study will look at gene expression and look at genes that are different in males and females regardless of diagnosis, and compare those that are different in autism. The researchers will use multiple approaches in humans and animals to explore these ideas. In this way, genes that sensitize a male to have autism versus those that protect a female from an autism diagnosis can be explored. This may lead to therapeutics that mitigate the symptoms of ASD in males and females.

Autism Science Foundation’s Pre-Doctoral Fellowship Grant Recipients

Jacqueline Barkoski, MPH, University of California at Davis

Mentors: Sally Ozonoff, PhD and Irva Hertz-Picciotto, PhD, MPH

Examining prenatal pesticide exposure, genetic susceptibility and risk for autism

Scientists concur that a combination of genetic and environmental factors increases risk for autism. However, the way that the two interact has been understudied. This project will leverage data from a high-risk pregnancy cohort called MARBLES to examine the influence of exposure to pesticides during pregnancy on ASD symptoms, including cognitive impairment and other psychiatric challenges in those children. In addition, an exploratory study will be launched to investigate the association between pesticide exposure during pregnancy and gene expression in mother and child with autism, something that has never been done before. By using this valuable longitudinal data collected prenatally, the study will help identify preventable risk factors and contribute to understanding the role of genetics and environment in autism diagnosis.

Spencer Moore, University of California at San Diego

Mentor: Alysson Renato Muotri, Ph.D.

Role of an autism-related cytokine in a genetic model of ASD

Besides fighting off infection, the immune system is now known to influence the way brain cells are shaped and sculpted. One immune system mediator of importance in ASD is a chemical called IL6, which is elevated following immune challenges associated with autism risk. This study will examine the role of IL6 in the brain in both an animal model of Rett Syndrome and cells from people with Rett Syndrome. Girls with Rett have several similarities to girls with autism, including the feature of loss of previously acquired skills, or regression. Therefore, understanding how specific genes influence autism risk is important for understanding autism in all forms. This study will more fully characterize the contribution of astrocytes, brain cells that can release IL6, on mutations of MeCP2, and more fully explain the role of immune molecules in neurodevelopmental disorders. This fellowship is being co-funded with the Rett Syndrome Research Foundation.

Christine Ochoa Escamilla, University of Texas Southwestern Medical School

Mentor: Craig M. Powell M.D., Ph.D.

Genetic mutations in chromosome 16 and their role in autism

Genetic mutations in an area of chromosome 16 called 16p11.2 are frequently associated with autism spectrum disorder and other neurodevelopmental disorders. One gene within this region affects head size and may be important for autism risk; another is a known autism risk gene. This study will remove these two genes from an animal model so that their role in the shaping and functioning of brain cells can be examined. The long-term goal is to understand the role of these genes in brain cell activity and identify novel therapeutic targets for future studies.

Woon Ju Park, University of Rochester

Mentor: Loisa Bennetto, PhD

Mechanisms of sensory processing in ASD

Oversensitivity or undersensitivity to sensory input is a common symptom of autism spectrum disorders. These symptoms show a great deal of variability among people with an ASD diagnosis. Individuals with autism also sometimes show variations in how they organize different types of sensory information and put it all together to interpret the world around them. This study will investigate factors that influence processing of visual information in people with ASD and how that then affects interpretation of visual input. This will ultimately lead to a better understanding of sensory processing in people with autism and help augment strengths of those with ASD so they can better cope with impairments.

Megha Subramanian, Johns Hopkins

Mentor: Mollie K. Meffert, MD, PhD

Study of a potentially novel biomarker for features of ASD

Many individual genetic variants contribute to ASD, but newer evidence emphasizes how these genes converge on a common set of pathways controlling the growth, development, shape and function of brain cells. In some people with autism, head size is enlarged starting very young, suggesting a type of autism that has specific genetic features. A biomarker that reflects fundamental differences in brain growth might be useful for early detection of ASD. This study will focus on small fragments of RNA called microRNA (miRNA) that control protein synthesis. Specifically, dysregulation of some miRNAs may lead to too much or too little protein in certain cells. The levels of these miRNAs can be measured in blood, which makes it a potential biomarker, and this project will reveal how specific miRNA pathways contribute to head growth in ASD.

Autism Science Foundation Undergraduate Summer Research Grants

Supported by the Joseph LeRoy and Ann C. Warner Fund

Armen Bagdasarov

Mentor: Robert Schultz, PhD, Children's Hospital of Pennsylvania

This research will closely examine several aspects of social communication in autism: word choice, gestures, turn taking and other conversational skills. This intensive focus on a core feature of autism will help improve communication intervention strategies for people with ASD.

Laura Bell

Mentor: Meghan Miller, PhD, University of California at Davis

The team at UC Davis will utilize second-by-second behavioral coding of infants at risk for ASD at different ages. Instead of just focusing on autism-related behaviors, this research will expand evaluations to include features of ADHD to identify early signs and symptoms for infants with an older sibling with autism, since ADHD is a common outcome among these infants.

Elliot Keenan

Mentor: Matthew D. Lerner, PhD, Stony Brook University

This research will examine the link between repetitive behaviors, perseverative thinking and autism symptoms in adults. It will also participate in validating a tool to measure IQ in autistic individuals with anticipated high IQ.

Adriana Mendez Leal

Mentor: April Levin, MD, Harvard University

Past studies of brain activity in infants have shown promise in using electrical signals in the brain to establish a very early biomarker of ASD. This research will compare brainwaves at 6 months to language scores at 18 months, further testing the idea that these are early biomarkers.

Eleonora Sadikova

Mentor: Elizabeth Redcay, PhD, University of Maryland College Park

This research will examine brain activity in individuals with autism in real time while individuals participate in a communication program called "Let's Chat." It will focus on areas of the brain involved in social reward to determine how social communication may or may not be reinforcing in people with ASD.

Tatiana Winkelman

Mentor: James McPartland, PhD, Yale University

Individuals with autism often suffer from poor sleep, which has long been a huge concern for families. This unique study will examine brain activity during waking hours and compare it to sleep quality in an effort to understand how these variables contribute to behavioral issues.

About the Autism Science Foundation:

The Autism Science Foundation (ASF) is a 501(c)(3) public charity. Its mission is to support autism research by providing funding to scientists and organizations conducting autism research. ASF also provides information about autism to the general public and serves to increase awareness of autism spectrum disorders and the needs of individuals and families affected by autism. To learn more about the Autism Science Foundation or to make a donation, visit www.autismsciencefoundation.org.

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