

IRSF Spotlight: Zhaolan “Joe” Zhou, PhD, University of Pennsylvania, School of Medicine

By Jim Keller

Last month the Investigator Spotlight focused on Dr. Monteggia, an IRSF Regular Research Grant recipient who is also Co-Chairing a Session at our 12th Annual Rett Syndrome Symposium. As the Symposium draws near, I'll be highlighting a key participant in the Investigator Spotlight each month. Dr. Zhou from the University of Pennsylvania, School of Medicine will Co-Chair this year's Session on the regulation and function of MeCP2 and is also a 2010 IRSF Regular Research Grant recipient. His project titled "The study of Rett syndrome with Mecp2 T158A knockin mice" involves the creation of a Rett syndrome mouse model that recapitulates a common Rett mutation. This new mouse model should provide researchers with a closely relevant platform to understand the molecular basis of Rett syndrome and will be valuable in assessing drug treatments for Rett syndrome.



Dr. Zhou's approach to scientific research has been developed from the valuable experiences he had as a graduate student and as a post-doctoral fellow. While in graduate school, Dr. Zhou was mentored by the legendary molecular biologist, Dr. Tom Maniatis and Dr. Robin Reed. During his graduate studies, Dr. Zhou took on a very challenging project which was previously thought impossible. By developing an ingenious strategy for purifying an important molecular complex within the cell nucleus, he was able to understand important aspects of how the cell's DNA copying process works. As a post-doctoral fellow with eminent neurobiologist, Dr. Michael Greenberg, Dr. Zhou turned his attention to addressing how environment, in the form of experience, modulates MeCP2 protein function, studies which led to the identification of key elements within MeCP2 thought to be responsible for experience-dependent maturation of neuron-neuron connections. This work transformed his research interest from biochemistry to the field of epigenetics and its role in physiology and disease.

Dr. Zhou's laboratory is now focused on understanding the functions of MeCP2 by developing an effective animal model of Rett syndrome, based on commonly occurring mutations seen in the disease. In this case he has developed a mouse model that recapitulates the Mecp2 T158A mutation, allowing researchers in the field to not only study the pathogenesis of the disease, but also to explore potential therapeutic strategies. Recently, Dr. Zhou was also named as a Pew Scholar in Biomedical Sciences and awarded a prestigious Biobehavioral Research Awards for Innovative New Scientists—or BRAINS, from the National Institute of Mental Health (NIMH) to study how environmental factors interact with certain genes to increase the risk of mental illness.

What prompted you to begin a career in research?

It is the fascinating nature of Biology that motivated me to pursue a career in science beginning in my college years.

What is the single most rewarding aspect of conducting Rett syndrome research?

The most rewarding aspect of our research is that our discoveries may lead to a potential treatment or prevention of Rett syndrome in the future.

What is a potential positive outcome of the research you're conducting that is specific to your IRSF Award?

We hope to provide a valid mouse model of Rett syndrome that faithfully recapitulates a Rett mutation. This new mouse model should provide a closely relevant platform to develop and assess therapeutic treatments for Rett syndrome.

If you could pick any one symptom of Rett syndrome to prevent or to provide relief for, what would it be?

To prevent or treat the occurrence of seizures.

What other diseases does your research focus on?

Infantile Spasms and Autism.

What else would you like the RTT community to know about you?

Science education and public awareness are equally as important as our bench research. In my spare time, I like to work with our local Technology Student Association (TSA) to provide guidance and mentorship to high school students by giving feedback to students on their respective science projects. Through this program I hope to help promote science education in public schools.