

IRSF Spotlight: Liang Zhang, MD, PhD, University Health Network, Toronto Western Research Institute

By Janice Ascano, PhD



With the many activities of this past summer, it is a pleasure to welcome the fall and continue with our Investigator Spotlight series. For this month's installment, it is a pleasure to focus on Dr. Liang Zhang from the University Health Network at the Toronto Western Research Institute. Dr. Zhang is an active participant in IRSF's research program, as he recently presented his work at the 12th Annual Rett syndrome Symposium and has been funded by IRSF's translational HeART grant mechanism since 2010. His project titled "Evaluating Carbonic Anhydrase Inhibitors as Potential Treatments for Rett Syndrome" aims to study an anti-convulsive drug (acetazolamide) in its ability to improve the neural and behavioral symptoms in MeCP2-deficient mice. Together with co-investigator Dr. James Eubanks, also at the University Health Network, they will study whether a second drug (valproate) will complement the actions of acetazolamide and increase the overall level of improvement in this RTT mouse model. If the results of this project show significant improvement in these mice, this study will provide the necessary foundation for testing these drugs immediately in Rett patients, as each of these drugs is already approved for clinical use in children.

Dr. Zhang has an extensive background in biomedical research, as he first obtained his medical degree from Wuhan University in China and then became a Lecturer and Assistant Professor in the Department of Medical Physiology at Wuhan University. He developed strong interests in physiology and pathophysiology of the mammalian central nervous system, and pursued a doctorate degree to expand his research capacity. Dr. Zhang obtained his PhD from the Department of Physiology at McGill University in Montreal, and then completed postdoctoral training at the University of Toronto. Dr. Zhang established his own lab and has been working at the Toronto Western Research Institute as a research scientist for the last 15 years. Dr. Zhang's research focus has expanded to neurophysiology and pathophysiology of behavior in animals. His lab has developed novel techniques that allow chronic monitoring of brain electrical activities from naive mice and mouse models of neurological disorders. In recent years, Dr. Zhang formed a collaboration with Dr. James Eubanks to examine neurophysiological outcomes in a mouse model of Rett syndrome.

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

The pathophysiology of Rett syndrome is of high complexity. In order to understand the disease process and to design effective treatment strategies for Rett syndrome, it is essential for researchers to consider pathological alterations in multiple organs/systems and at both microscopic and macroscopic levels. In the course of Rett syndrome research, I learned a lot and am still in the learning process as to how to think and operate at macroscopic levels while conducting individual, focused projects.

Identify a potential positive outcome of the research you are conducting that is specific to this proposal.

The focus of our project is to examine whether treatments with the carbonic anhydrase inhibitor acetazolamide alone or together with the anticonvulsant valproate suppress epileptiform brain activity in Rett mice. If so, our project may promote the use of carbonic anhydrase inhibitors as a treatment strategy for Rett syndrome.

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

Rett-associated epileptic seizures.

Besides your role as principal investigator on this project and as a Rett syndrome investigator, what other roles do you currently hold that are specific to the field of Rett syndrome research?

I am an executive member of the University of Toronto Epilepsy Program. I am a primary investigator of two operating grants from the Canadian Institute of Health Research and the Natural Science and Engineering Research Council of Canada. These grants are aimed to study the cellular and network activities of “normal” and epileptic brains in rodent models.

Provide any other interesting information about yourself or your work that you would like the Rett syndrome community to know about you.

I am a member of the American Epilepsy Society, the American Society for Neuroscience, the Chinese American Association of Biomedical Researchers, and the Canadian League against Epilepsy.

For more information on Dr. Zhang, please visit: [this page](#).

For a list of Dr. Zhang's publications, please visit: [this page](#).