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Insights from the Network

Exploring Stem Cells, Diabetes Therapies, and Life Lessons: A Conversation with Dr. Shenghui Liang, the 2024 Drew Lyall Award Winner

Drew Lyall Awardee Q&A ,
Shenghui Liang, Ph.D.,
University of British Columbia

Shenghui Liang, Ph.D., is a Postdoctoral Fellow in Dr. Timothy Kieffer's lab at the University of British Columbia. He earned his doctorate from Peking University, where he focused on islet development and beta cell function using both mouse models and stem cell-derived islet models. During his time there, he also advanced research on generating islet organoids from human stem cells. With a strong passion for diabetes research and cell therapy, Shenghui joined Dr. Kieffer's lab in 2019 to continue exploring innovative solutions for diabetes treatment.

Shenghui is the recipient of the 2024 Drew Lyall Award of Excellence as the lead author of the highest ranked abstract in the TMM2024 abstract competition for his work on *A stem cell-derived islet budding model for islet biology and disease study*. SCN's Joanna Valsamis, Director of Knowledge Mobilization, had the chance to chat with Shenghui, who spoke about his work, his career path, and some personal anecdotes.

Congratulations on your award Shenghui! To start off, tell us a little bit about your area of research.

My research is focused on stem cells and islet biology. Specifically, I'm interested in exploring ways to improve stem cell differentiation into glucose-responsive insulin-producing beta cells, engineer stem cell-derived islet models for studying normal development and probing pancreas diseases, as well as develop strategies to make safe and immune-evasive stem cell-islets for cell replacement therapies.

In the lab or in another aspect of life, what is the best piece of advice you have ever been given?

The best piece of advice I've ever been given is to "Match topics with your style, remain honest, rigorous and reliable. And have fun in science and life," from Professor Bertil Hille at the University of Washington.

In your opinion, what is the single most important life science or biomedical breakthrough in the last decade?

I think the most important breakthrough is the discovery that mature cells can be reprogrammed to become pluripotent – i.e., induced pluripotent stem cells (iPSCs). It was long thought that a mature or specialized cell could not return to an immature state. In 2006 and 2007, however, Dr. Shinya Yamanaka identified only four genes, that when activated, can reprogram skin cells from a mouse and human to immature stem cells, which, in turn, can grow into virtually all types of cells within the body. The discovery of iPSCs definitely opens new doors and creates many imaginations for biomedical and life science.

There might be many scientists who inspire you. If you had to pick one, who is your favourite scientist and why? It could be someone you know personally or a famous scientist from history.

Nikola Tesla is one of my favourite scientists because I think he is a true scientist with many incredible innovations. I am always inspired by his great passion on changing the world, firm faith in the pursuit of truth and the bravery of challenging authority (for the well-known battle of alternate and direct current, the latter is supported by another famous inventor, Thomas Edison).

What was your biggest mistake (personally or professionally) that ultimately turned into a positive?

I remember once, I had a key reagent run out, and I had to use an expired one for the first stage of stem cell differentiation, which induces endoderm cells (a precursor cell that can later develop into beta cell). I initially thought all cells would fail in differentiating, but to my surprise, I noticed a small subset of cells ("super cell") within the population remained responsive to the expired reagent and differentiated to endoderm cells. This mistake led to my recent work, now published in *Nature Communications*, showing the importance of Wnt signaling range in the early stage of pancreatic cell formation as well as establishing a pancreatic budding model with human cells, which may mimic the key process during in vivo pancreas organogenesis.

Innovations are always around the corner. For the sake of speculation, what are your predictions for stem cell advances in the next 5, 10, 20 years?
The reliance on chronic immunosuppression is one major hurdle in diabetes cell therapies. Given the remarkable advances in the development of technologies to overcome immune rejection and the emergence of immune-evasive/cloaked cells, I believe the goal towards a functional cure for diabetes will hopefully soon become achievable.

Tell us about one thing you do outside of the lab in your free time. Is there anything you are watching or reading that you recommend, or another hobby that keeps you busy?
Outside of the lab, I enjoy spending my time playing badminton, which keeps me healthy, positive and collaborative. It's quite a relaxing sport and always refills me with energy. I can also make new friends on the badminton court!