

Science@CornellVet

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For graduate students, often the best way to get feedback on their work and find out what is happening in their scientific field is to attend scientific conferences. This usually involves traveling somewhere far away just to get to speak to experts and hopefully return home with some helpful advice. On July 31st, 2017, Cornell grad students and postdocs got to do just that... right here on campus.

Poster session showcases the essentials

The 6th stem cell symposium, held at the Alice Statler Auditorium at Cornell's main campus, brought together renowned experts in the field of stem cell research as well as graduate students and postdocs from across disciplines. The symposium included a poster session in which participants had to summarize their work for the judges in three minutes or less. "We had a team of six faculty critically reviewing the posters for our poster competition, which encouraged the students to focus on the essentials of their research and practice conveying it in a concise and interesting way, a great training in itself," says Dr. Tudorita Tumber, Chair of the Stem Cell Seminar and Meetings Committee and associate professor from the Department of Molecular Biology and Genetics at Cornell University.



Robert J. Yamulla, graduate student from the Department of Biomedical Sciences, took home the third-place prize of the poster contest for his work on ovarian cancer. He will receive a \$400 training award.

This year's poster session was particularly challenging to organize. "We typically get 25-30 posters, but this year we got 50. This shows the increasing interest and vastness of stem research on our campus," says Tumber. Nonetheless, the poster session was a success. "There was a lot of exciting science and a lot of enthusiastic interactions between our faculty, our guests, and our students and post-docs, and I know firsthand of new collaborations that started during this time."

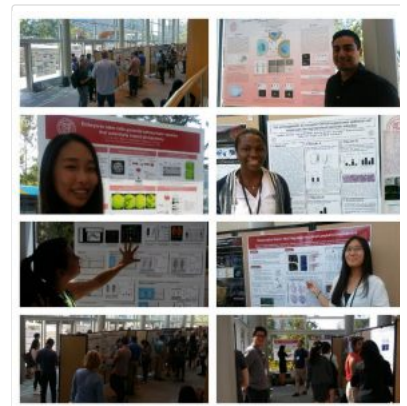
For Yun Ha Hur, a veterinary doctor and a graduate student from the Department of Molecular Medicine, this symposium was her first poster presentation. "I was scared at first but people have been very generous with their feedback," says Hur, who studies how embryonic stem cells use microvesicles to induce stem cell characteristics in fully differentiated cells.

Divya Shiroor, graduate student in the Department of Molecular Medicine, knew the symposium would be an "informal setting to talk about science. There are a lot of different trends going on in stem cell research, and it's nice to get out and see how broad it is." Divya studies how stem cells behave in response to injury in planaria.

Embryonic stem cells: an update

Embryonic stem cell research holds great promise for the future of regenerative medicine, due to their potential to generate any cell type of the body. The symposium speakers touched on various aspects of stem cell biology including how we can use embryonic stem cells to treat disorders such as Parkinson's disease, muscle degeneration, diabetes, and liver damage.

Dr. Nissim Benvenisty traveled the farthest to be at the symposium. He is a professor of genetics from the Hebrew University of Jerusalem in Israel, and the director of The Azrieli Center for Stem Cell & Genetic Research. He and his group led the discovery of a new type of stem cell derived from a human egg: The haploid embryonic stem cell. All the cells in our body are diploid, meaning they have two sets of chromosomes—one from the mother and one from the father. The egg and the sperm are the only exceptions: They are called haploid cells because they only have one set of chromosomes. Benvenisty's group used haploid human eggs to generate human embryonic stem cells with one set of chromosomes. He explained that haploid embryonic stem cells have many of the properties that diploid embryonic stem cells have, including the ability to become any cell type. However, haploid stem cells have an added advantage: Because they contain only half of the genetic diversity, they can serve as a better genetic match for cell-based therapies. This unique property also makes them suitable for detecting the biological effect of genetic mutations. In diploid cells, detecting the effect of a single copy mutation is difficult because the other copy is normal and serves as back up. Haploid stem cells, on the other hand, only have a single copy to target, making it easier to detect the effect of a mutation.



CVM students Julio Sanchez, Yun Ha Hur, Oyebola Oyesola, Divya Shiroor, and Shing P. Hu present their posters at the 6th stem cell symposium

Human embryonic stem cells are still in

Although haploid stem cells may represent a good alternative in the field of regenerative medicine, human embryonic stem cells are still a powerful avenue to explore. Dr. Viviane Tabar, professor in the Department of Neurosurgery at Memorial Sloan Kettering Cancer Institute and professor of neuroscience at Weill Cornell Medicine, told us about the extensive study she and her colleagues completed on the use of human embryonic stem cells for the treatment of Parkinson's disease. She explained that Parkinson's disease is characterized by loss of dopamine-producing neurons in a region of the brain known as the substantia nigra. She and her team discovered a way to coax human embryonic stem cells into dopamine-producing neurons, and developed a protocol to generate large amounts of these cells and cryopreserve them for future use. They demonstrated that these cells can successfully engraft in the brains of both mice and primates and that they can produce dopamine and ameliorate symptoms of Parkinson's disease, including tremors. They also demonstrated that these cells are safe because they did not generate tumors in the animals. Her work is currently on the road to a phase 1 clinical trial.

The 6th stem cell symposium was an opportunity for both students and speakers to get a sense of the current state of stem cell research. According to Tumber, it also offered a "great opportunity to strengthen our stem cell community at Cornell and provide opportunities for synergistic collaborations and training."



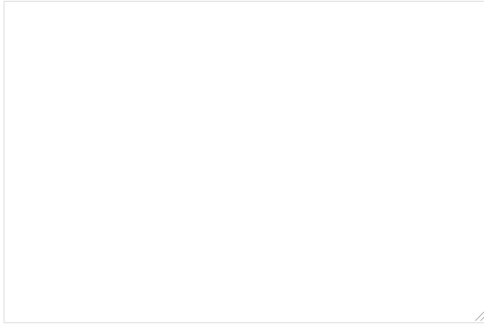
Symposium speakers pose for a picture at the end of the symposium. From left to right: Drs Nissim Benvenisty, Viviane Tabar, Roeland Nusse, Shuibing Chen, and Benjamin Cosgrove.

-Luisa Torres, Postdoctoral Researcher in Microbiology & Immunology

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