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Advances in Stem Cell Biology, Institut Pasteur, Paris, June 26 - July 8 2023

Between June 26th and July 8th, I participated in a course on advances in stem cell biology at the Institut Pasteur in Paris. The course included practical sessions and lectures, which provided comprehensive insights into various technologies and advancements in stem cell biology.

As a first-year PhD student, this course was an adventure and an opportunity to gain experience with stem cells. During these two weeks, I learned and covered many techniques, topics and discussed many questions. Some practicals included cultivating (maintaining and passaging) induced pluripotent stem cells (iPS). iPS cells are cells that have originated from the human body and have been reprogrammed to self-renew and make all different cell types in the body. Other cell culture techniques included extracting and growing intestinal organoids (mini guts), gastruloids (mini-organs mimicking a stage of development called gastrulation) and muscle stem cells. Organoids are 3D in vitro simplified and miniaturized versions of an organ, which mimic some properties of the actual tissue. Therefore, I gained insight and context into different model systems and human iPS cells, which I am using in my project.

I was also shown how to dissect chicken embryos; this model is used to study early development, particularly a stage called somitogenesis, which is when your skeleton starts to form. I also studied regeneration by using worms as a model system. Some species can regrow the whole segments of their body if you amputate them. Therefore, the topics were diverse, and I think, as a scientist, it is important to know these different systems even if you are not researching the current topic, as it gives you a broader picture of research and a different angle on your current project.

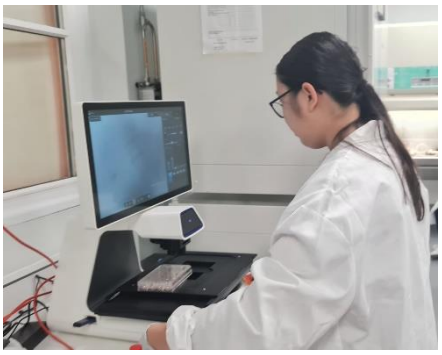
There were many interesting moments on the course, and some memorable parts were the meaningful discussions with the speakers and peers. As a cohort, we were 14 students. These discussions were unique and are something you do not normally obtain in seminars. I love asking questions and understanding different topics. The collaborative aspect of sharing and exchanging ideas in science is also an important thing I rediscovered during this course.

The most memorable seminar/lecture was one where the speaker explained a case study where he saved an eight-year-old boy's life. This boy had a rare genetic condition that caused him to lose most of his skin. The speaker explained how he saved this individual's life by using gene editing to correct the mutation and regrowing the boy's skin in vitro. The lecture was very impactful as it gave an example of the medical application of stem cell research. Another interesting topic was the advancements made on intestinal organoids. It was quite surprising how we could bio-print a cellular matrix structure which supports the cultivation of organoids, this enables the organoid to closely mimic a mouse intestine. However, I also learned some of the limitations of these models, such as reproducing them with human stem cells, which is a bit more challenging, in addition to understanding the ethical implications of these technologies and how they affect the economy and the general public's perception.

Overall, this course has taught me the importance of critical analysis, the limitations of using different models, and the importance of scientific integrity, communicating, sharing, and exchanging current ideas. I would recommend any PhD student to this course as I have learned so much during these two weeks. The whole experience was sometimes challenging, but I would embrace any new opportunities to broaden my horizons and move forward in science.

All of the cohort on a bead trip

Me in Paris



Me looking at iPS cells.

Me electroporating a chicken embryo.