

# FIR: A 10K+ Experience

Dear CSR Executive and Members,

I would like to express my sincere gratitude for the support I received from CSR to attend the 2015 “Frontiers in Reproduction (FIR)” course that was held at the Marine Biology Laboratory (MBL) in Woods Hole, Massachusetts. It is my pleasure to report on my extraordinary experience at FIR and to share a selection of the hundreds of pictures I took.



The view from the dorms



Lecture

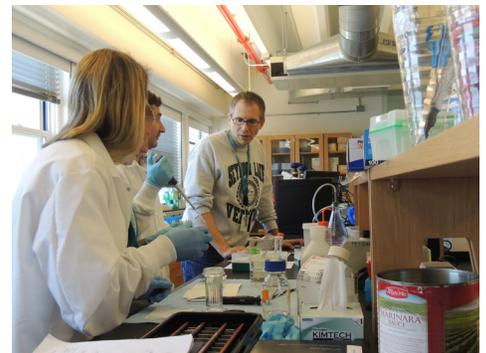
FIR is an intensive 6-week laboratory and lecture course for scientists-in-training (graduate students, postdoctoral fellows, and junior faculty) who seek to improve their knowledge and experimental skills in order to enhance their scientific progress ([fir.mbl.edu](http://fir.mbl.edu)). The FIR course is divided into three 2-week sections, each section covering relevant and exciting topics and consisting of lectures, discussions, informal seminars, demonstrations, hands-on lab exercises, one-on-one tutorials and lab wrap up. The lectures were delivered by 61 world-renowned professors in the field of reproduction, each of whom shared his or her expertise in one of the sections covered by the course.

A typical day at FIR starts at 9 AM with a 2 hour lecture followed by a short introduction of background materials and specialized techniques that will be used in the afternoon lab exercise. The lab



Group data analysis

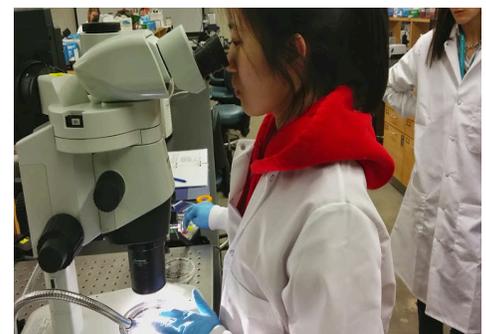
session, in the afternoon, lasts at least 5 hours each day and frequently continues past 9 PM. An evening lecture or seminar is given between 7 and 9 PM. Students at FIR – or FIRbees, as they are called – are not only encouraged to ask questions during the lectures but also have the invaluable chance to further discuss with the speakers during lunch, dinner and social gatherings.



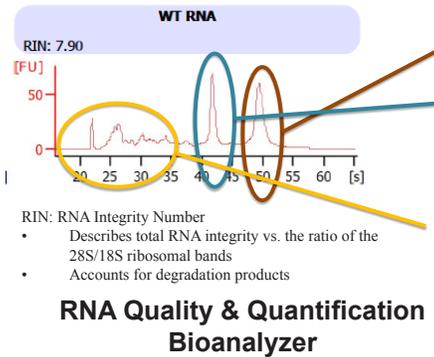
Lab practice

## Section 1: Signal Transduction and Gene Regulation in the Hypothalamic-Pituitary-Gonadal Axis

The first two weeks focused on cell signaling in the HPG axis. During my PhD studies, I have routinely used mouse models to study gene function in reproduction. At FIR, I had the chance to handle other animal models for the study of reproduction, including cow, xenopus, fish, and sheep. In addition to practicing technologies that I was already familiar with, I also learned several specialized methods, such as: 1) Visualizing xenopus oocyte maturation with or without the interruption of cAMP signaling pathway,



Xenopus oocyte injection



2) Studying GnRH-dependent gene transcription in pituitary L $\beta$ T2 cells using promoter-reporter (luciferase) analyses and ChIP analyses, 3) Extracting RNA from bovine follicular fluid, analyzing RNA integrity, practicing digital PCR, and 4) Isolating mouse pituitary glands and performing immunofluorescence on pituitary and embryo sections.

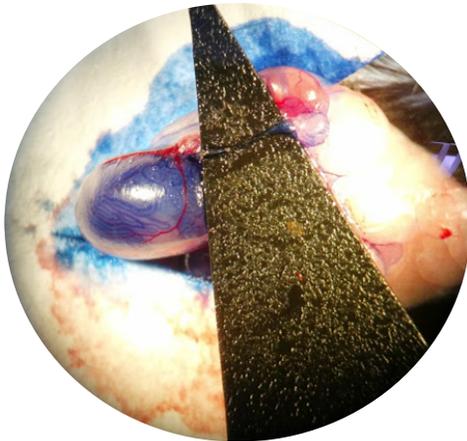


**Bovine follicle isolation**

## Section II: Gametogenesis, Fertilization and Stem Cells

The second two weeks focused on germ cell studies in mouse gonads. Highlights of this section included:

- 1) Practicing spermatogonial stem cell transplantation,
- 2) Visiting the aquarium in MBL and learning marine fertilization using confocal imaging, microinjection, etc.,
- 3) Performing IF for chromosome spreads,
- 4) Isolating and culturing mouse primary follicles in vitro,
- 5) Hands-on mouse and zebrafish IVF,
- 6) Practicing ICSI,
- 7) Systemically learning how to use the microscope for laboratory application,
- and 8) Visualizing calcium waves in oocyte activation.



**Cannulation of the efferent ducts for germ cell transplantation**



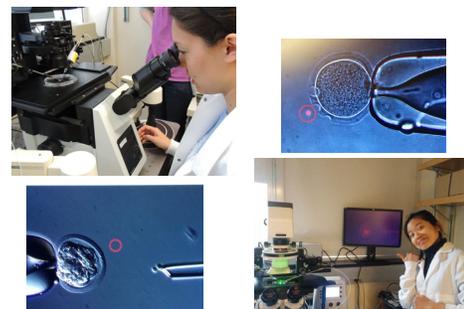
**Visiting the MBL Aquarium**



**Zebrafish IVF**



**Mouse Follicular Culture**



**Intra-cytoplasmic sperm injection (ICSI)**

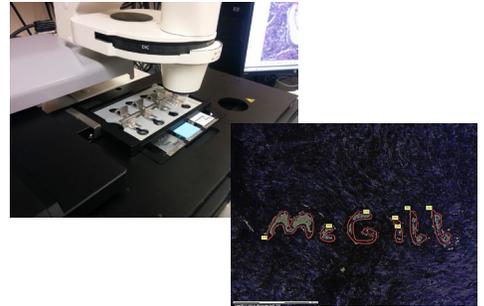
### Section III: Implantation, Development of the Reproductive Tract and Transgenesis

The final two weeks focused on implantation. The highlight of this section was to practice methodologies that are used for clinical IVF in the US and to learn data analysis using bioinformatics technology.



Microscopy

Throughout this section, I had many chances to practice 1) DNA and ES cell microinjection, 2) Mouse embryo transfer, 3) Laser dissection, 4) Flow cytometry, 5) in vitro decidualization, etc. Additionally, I participated in a lab demonstration on placentation in domestic animals, such as pig and sheep.



Laser capture microdissection

While this intense course involves lots of work, FIR also schedules fun activities for the students, including whale watching, an international cookout, and many beach parties. However, as all FIRbees will attest, this is NOT a picnic! FIR provides a focused and intense learning and teaching atmosphere and the unique opportunity for trainees to establish invaluable career networks with senior investigators and to develop incomparable and unforgettable friendships with the other 19 trainees from all over the world.



Beer time!



Delicious, all-you-can-eat food



In conclusion, I would say I experienced a lot, grew up significantly and learned more than I imagined possible at FIR 2015. The knowledge and technologies that I gained at FIR will certainly benefit my future career development and enable me to be a better reproductive biologist. I highly recommend this course for all reproductive biology trainees!

For more information about FIR, see the attached flyer for next year's course or visit [fir.mbl.edu](http://fir.mbl.edu).

Sincerely,

Yining Li