Where would stem cell research and outreach be today without Ka Yi Ling?

Aug. 21, 2017

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When it comes to student contributions to all things stem cell on the UW-Madison campus for the past 10 years, one name rises to the forefront: Ka Yi Ling.

Earning her masters degree in endocrinology and reproductive physiology in 2013, Ka received her Ph.D. in the same field, studying with Karen Downs, Ph.D., then professor of cell and regenerative biology. The lab team was interested in embryonic and extra-embryonic interactions during development. Ka’s project focused on the visceral endoderm, commonly known as the yolk sac, and its role in mammalian development. Using classical fate mapping techniques, she identified unique roles of the visceral endoderm in forming the fetal-umbilical connection.

“This discovery challenges the dogma that extra-embryonic tissues are not able to contribute to embryonic development,” Ka says. In addition, she characterized a novel progenitor/stem pool essential in forming posterior mammalian features. Besides learning and bridging the gap of knowledge in developmental biology, her work provided insights into understanding umbilical cord associated birth defects.

“My favorite part of research is getting my hands into it and being able to learn about development just by removing certain structures, or fate mapping regions of interest,” she describes.

Ka majored in molecular biology as an undergraduate at UW-Madison from 2006 to 2009. She learned how to culture human embryonic stem cells with James Thomson, V.M.D., Ph.D., at the Genetics-Biotechnology Center and was a founder of the Student Society for Stem Cell Research, UW-Madison Chapter. She was also among the first student volunteers to help launch the SCRMC’s Stem Cell Learning Lab at the Biotechnology Center in 2008. This outreach lab, the first of its kind in the nation, gave school children and the public a look at live stem cells from the Thomson lab and offered them hands-on experience in cell culture techniques. The lab is still going strong today, with teachers contacting the UW-Madison Campus Visit Program to set up field trips.

While still an undergraduate, Ka accepted the challenge of helping the Genetics Policy Institute, SCRMC and partners host the World Stem Cell Summit in September 2008. In particular, she was a major organizer of “Lab on the Lake.” This was a public outreach and education day at the Pyle Center before the three-day summit at the Alliant Energy Center: Ka was instrumental in organizing an experts’ panel, career and education fair, SSSCR breakfast, and annual meeting for the 30 national SSSCR chapters. Through this experience, she gained a unique and
early understanding of how to communicate and work with a spectrum of people interested in stem cell research — students, faculty, high school science teachers, administrators, public policy makers, citizens, religious leaders and others in the health, ethics, law, education, and patient advocacy fields. More than 1,000 people attended the summit and over 700 enjoyed Lab on the Lake. Ka’s efforts helped earn UW-Madison’s SSSCR the Chapter Excellence Award, which she accepted from Genetics Policy Institute Director Bernard Siegel at the summit’s banquet.

After her auspicious undergraduate years, Ka returned to her native Singapore with a B.S. in molecular biology to work as a research officer for one year. This is a national requirement for all students who pursue their higher education abroad. She pursued her stem cell research interests in the medical biology lab of Davor Solter and Barbara Knowles at the Institute of Medical Biology in Singapore. During her high school years, Ka had already completed an impressive string of student intern rotations in medical biology, bioengineering, nanotechnology and bioprocessing. Ka has earned Singapore National Science Scholarships for both her bachelor’s and graduate studies. While in Madison, she kept close ties to her homeland, serving as an external coordinator for the Singapore Student Association.

Ka recently served as president of the Wisconsin Stem Cell Roundtable (WiSCR), a group of graduate students and post-docs active in stem cell and regenerative medicine research and outreach at UW-Madison. She also served on the Graduate School’s Endocrine Reproductive Physiology Program Seminar Committee.

Ka is now a research fellow at the Institute of Molecular and Cellular Biology, Agency for Science, Technology and Research (A*STAR) Singapore. She is examining environmental influences on early development, in particular looking for epigenetic signs or changes in DNA methylation in IVF babies. “Ideally, long term we can use this as a test to determine the efficiency of the myriad of IVF techniques available and help make healthier babies” Ka says. She would like to continue as a senior scientist in a lab or a facility scientist and is also interested in science communication.

“Some of my favorite experiences in Madison include helping organize the World Stem Cell Summit in 2008, the SCRMCFall Conference in 2013, the WiSCR Summer Undergraduate Research Fellowship in 2013, and outreach with the SCRMCSeminar Committee,” Ka shares.

“I would like to thank my advisor, Dr. Karen Downs, for her guidance and support, and Dr. James Thomson for initiating my interest in pluripotency and mentoring me in my undergraduate thesis project despite his busy schedule,” she adds. “Also, I am grateful to Dr. William Murphy, co-director of the SCRMCFacility, for motivating WiSCR to expand and providing all sorts of support in WiSCR’s development.”

We wish Ka all the best in her endeavors and appreciate all she has done for stem cell research, both in the lab and with helping people better understand this exciting field of research and medicine.
Ka (at center) holds the 2008 World Stem Cell Summit’s Student Society for Stem Cell Research Chapter Excellence Award. From the left are fellow SSSCR members Melissa Breunig, Stephanie Hazelbauer, Erin Borchardt and Sasha Rackman.

As a student volunteer in the SCRMC/Biotrek Stem Cell Learning Lab in 2008, Ka taught proper pipetting techniques to Madison sixth-grader Gavin Huismann.
Ka with Professors Davor Solter and Barbara Knowles at the Singapore Institute of Medical Biology in 2009.

Ka (fourth from right) enjoys the poster competition at the SCRMC 2013 Fall Conference, which she helped organize at the Discovery Building.
Stem Cell Jeopardy is a popular SCRMC Fall Conference highlight. In 2013, Ka awaits a response with Conference co-planners Paul Wrighton, a graduate student in Laura Kiessling’s biochemistry lab, and Ethan Lippmann, a post-doc in Randy Ashton’s stem cell bioengineering lab.