

PROMOTION RECOMMENDATION
UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF CELL AND DEVELOPMENTAL BIOLOGY

Approved by the Regents
May 16, 2013

Yukiko Yamashita, Ph.D., assistant professor of cell and developmental biology, Department of Cell and Developmental Biology, Medical School, is recommended for promotion to associate professor of cell and developmental biology, with tenure, Department of Cell and Developmental Biology, Medical School [also being promoted to research associate professor, Life Sciences Institute].

Academic Degrees:

Ph.D.	1999	Kyoto University, Japan
B.S.	1994	Kyoto University, Japan

Professional Record:

2007-present	Assistant Professor of Cell and Developmental Biology, University of Michigan
2007-present	Research Assistant Professor, Life Sciences Institute, University of Michigan

Summary of Evaluation:

Teaching: Dr. Yamashita is extensively involved in teaching. She is a lecturer and laboratory supervisor of the M1 medical histology course, and is a lecturer in the Dental School histology course. She also presents lectures in the graduate level courses, Developmental Biology (CDB580) and Organogenesis of Complex Tissues (CDB680). For the past four years, Dr. Yamashita has also served as a faculty evaluator for the Cell and Molecular Biology (CMB) weekly graduate student seminars. Furthermore, she served as the faculty coordinator for the CMB short course on the Stem Cell Niche (No Cell Is an Island: Exploring Stem Cell Microenvironments). In addition to Dr. Yamashita's classroom instruction, she is very involved in teaching in her laboratory, providing hands-on experience to post-doctoral fellows, graduate and undergraduate students. In addition to laboratory experience, she emphasizes the importance of critical thinking, and helps her trainees develop their abilities to formulate new research projects. She has mentored five post-doctoral fellows (of the five, three are current). Dr. Yamashita mentors three graduate students. One of her students received two prestigious pre-doctoral fellowships, an NRSA from the NIH, as well as a fellowship from the American Heart Association. Dr. Yamashita has served or continues to serve on nine graduate dissertation committees (including the three students from her laboratory). In addition, she served on eight Ph.D. candidacy examination committees.

Research: The overall goal of Dr. Yamashita's research is to determine the functions and regulation of adult stem cells. Adult stem cells provide differentiated cells, and maintenance of their proper number is critical for human health. Loss of adult stem cells likely underlies aging,

and conversely, over proliferation of stem cells also has severe pathological outcomes, including cancer. Dr. Yamashita has made several novel contributions to this competitive field. In starting her own laboratory, Dr. Yamashita followed up on her seminal post-doctoral studies where she showed that germline stem cells in the testis achieve a specific orientation prior to undergoing an asymmetric division. She discovered that there is a centrosome orientation checkpoint that prevents cells from undergoing cell division prior to correct position of the centrosome. These new findings, published in *Nature*, opened up two new lines of investigation where Dr. Yamashita and co-workers discovered that during aging, and also during starvation, there is a loss of the ability of the centrosomes to orient correctly, and this results in loss of stem cells. Notably the pathways that regulate the age-associated events are distinct from those triggered by starvation. In addition to these studies, Dr. Yamashita initiated a set of investigations where she found that division of two distinct types of stem cell found in testis, coordinate their division with each other. In yet another study, Dr. Yamashita revisited the immortal strand hypothesis, and showed that this hypothesis does not occur in *Drosophila* male germline cells. These and other studies from Dr. Yamashita, show that she is a highly creative thinker and is effective at choosing the correct path to answer critical questions. Dr. Yamashita's research is highly regarded. The most recent evidence for her high standing in the field was her receipt of a MacArthur Fellow (Genius) Award; 2011. She also received the highly competitive Women in Cell Biology, Junior Career Recognition Award from the American Society for Cell Biology; 2009. She was also a Searle Scholar; 2008-2011. Dr. Yamashita has published in high-ranking journals including *Nature*. She is widely sought out as a speaker at international and national conferences as well as public and private academic institutions.

Recent and Significant Publications:

Cheng J, Turkel N, Hemati N, Fuller MT, Hunt AJ, Yamashita YM: 2008 Centrosome misorientation reduces stem cell division during aging. *Nature* 456:599-604, 2008.

Cheng J, Tiyaboonchai A, Yamashita YM*, Hunt AJ: * Asymmetric division of cyst stem cells in *Drosophila* testis is ensured by anaphase spindle *Development* 138:831-837, 2011. *co-corresponding authors.

Yadlapalli S, Cheng J, Yamashita YM: *Drosophila* male germline stem cells do not asymmetrically segregate chromosome strands. *J Cell Sci* 124:933-939, 2011.

Inaba M, Yuan H, Yamashita YM: (2011) Cdc25/String regulates stem cell maintenance, proliferation, and aging in *Drosophila* testis. *Development* 138:5079-5086, 2011.

Yuan H, Chiang C-YA, Cheng J, Salzmann V, Yamashita YM: Regulation of cyclin A localization downstream of Par-1 function is critical for the centrosome orientation checkpoint in *Drosophila* male germline stem cells. *Dev Biol* 361:57-67, 2012.

Service: Dr. Yamashita has served for several years on the Center for Stem Cell Biology Faculty Search Committee, and has served on the CDB Faculty Search Committee. She is a long-standing member of the CDB Seminar Committee and also serves on the Reproductive Science Program seminar committee. She also served on the CDB graduate student admissions

committee. Dr. Yamashita is a member of the American Society of Cell Biology, the Genetic Society of America, the International Society for Stem Cell Research, and the Society for Developmental Biology. Dr. Yamashita is highly sought after for service at the national level. She is on the editorial board of the journal *Molecular Biology of the Cell*, as well as *Current Protocols in Stem Cell Biology*. She is a reviewing member of *F1000 Research*. In addition, she performs peer-review of manuscripts for a large number of journals including: *Annals of the New York Academy of Sciences*, *Cell*, *Developmental Biology*, *Journal of Cell Biology*, *Journal of Cellular Biochemistry*, *Journal of Cell Science*, *Molecular and Cellular Biology*, *Nature*, *Nature Cell Biology*, *PNAS*, *Science*, as well as the journal, *Transgenic Research*. In addition, Dr. Yamashita has served as an ad hoc reviewer for the NIH, NSF, Cancer Research UK (Quinquennial Review), Wellcome Trust, the NYSTEM program, the Hungarian Scientific Research Fund (OTKA), American Federation for Aging Research, and for the European Research Council.

External Reviewers:

Reviewer A: "...Yukiko is very unique. She has an outstanding research background, she is creative and has the capacity to produce extremely high quality scientific work that documents her commitment to research. In my view, Yukiko is emerging as a leader in her field..."

Reviewer B: "She has established her-self as one of the rising stars in model organism stem cell biology....Dr. Yamashita is clearly an outstanding scientist and her future progress seems assured."

Reviewer C: "By addressing questions of stem cell asymmetry and aging she has focused on some of the most interesting aspects of modern stem cell biology. By developing tools to address these questions in [a] logical and experimentally sophisticated manner her work sets new standards in the field....She is nationally and internationally recognized. She excels in training students and postdoctoral fellows. She is a jewel in your stem cell program."

Reviewer D: "...her work exemplifies a very high level of scholarship that is a great example to all of us. For an early career scientist in a very crowded and competitive field, she stands above the rest."

Reviewer E: "Altogether, Dr. Yamashita's research program is exciting, deep and important. She has established herself as one of the leaders in the cell biology of stem cell division. Her work is of the highest quality and comparable to other more senior leaders in the field..."

Reviewer F: "...it is individuals like Yukiko that can arguably be said to stand the highest likelihood of making a lasting contribution to our understanding of key and fundamental biological processes."

Reviewer G: "Yamashita has very rapidly become recognized by the international stem cell community. She has been invited as a plenary speaker at most of the top meetings in the field, something quite unique unusual for someone so junior. She has won several major national awards, including the prestigious MacArthur award. Taken together, she has become widely

viewed as a rising superstar [of her cohort], and is undoubtedly becoming a target for recruitment.”

Reviewer H: “...Dr. Yamashita is an outstanding scholar with an excellent track record of accomplishments in her research field (stem cells) in the past years. She is already an internationally recognized leader in stem cell research especially in germ stem cells.”

Summary of Recommendation:

Dr. Yamashita has accomplished a record of exceptional scholarship and funding since coming to Michigan. The high quality of her research is broadly recognized by colleagues here as well as at other premier institutions, and has led to her receiving several prestigious awards, including the MacArthur “genius” award. Her expertise in stem cell biology and her extremely strong publication record are widely acknowledged. She is an excellent teacher and mentor. Dr. Yamashita has assumed many administrative responsibilities within the University, serving on numerous committees in the Department of Cell and Developmental Biology, as well as in other programs. I am pleased to recommend Yukiko Yamashita, Ph.D. for promotion to associate professor of cell and developmental biology, with tenure, Department of Cell and Developmental Biology, Medical School.



James O. Woolliscroft, M.D.

Dean

Lyle C. Roll Professor of Medicine

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