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The Auditorium (Level 1)

Rejuvenate ovarian follicles for human reproductive longevity

Dr HaiYang WANG
National University of Singapore, Singapore



Dr. HaiYang Wang received his PhD from the Chungbuk National University, South Korea. He then did postdoctoral work at Johns Hopkins University with Prof Rong Li. He is currently Senior Research Fellow of Mechanobiology Institute, National University of Singapore. His research focuses on understanding the molecular and cellular mechanisms that govern the maturation, quality, and aging of oocytes.

Meiotic maturation and fertilization involve two rounds of asymmetric cell divisions generating a large fertilized egg and two small polar bodies. The position and orientation of meiotic spindles are critical for the success of these divisions. The correct spindle positioning is accomplished through migration of the spindle from oocyte center to a subcortical region driven by actin-based forces. I present recent findings on how a critical actin nucleating protein is recruited to the ER membrane surrounding the spindle to initiate actin polymerization and directional spindle movement. My ongoing research investigates how the dynamic processes during oocyte maturation may be impaired in female reproductive aging. We developed an innovative experimental system called "Reconstituted Chimeric Follicle" (RCF). This system allows us to rejuvenate oocytes from aged mice using a youthful somatic environment. This research provides the basis for a future follicle somatic cell-based therapy to treat age-associated female infertility.

3 Recent Publications:

1. Wang, H.*, Huang, Z., Lee, Y., Song, X., Wu, L.H., Pakkiri, L.S., Shu, C., Shen, X., Lim, P.L., Zhang, X., Zhu, J., Li, R.*. (2023). Rejuvenation of aged oocyte through exposure to young follicular microenvironment. * co-corresponding. Manuscript submitted to Nature; currently, a revised version is under review

2. Wang H, Hu J, Yi K, Ma Z, Song X, Lee Y, Kalab P, Bershadsky AD, Miao Y, and Li R. Dual control of formin-nucleated actin assembly by the chromatin and ER in mouse oocytes. Curr Biol 2022;. [PMID: 35981539]

3. Wang H, Li Y, Yang J, Duan X, Kalab P, Sun SX, and Li R. Symmetry breaking in hydrodynamic forces drives meiotic spindle rotation in mammalian oocytes. Sci Adv 2020; 6(14):eaaz5004. [PMID: 32284983]