



Online Seminar hosted by the Program of Totipotency

**2023. March 23 (Thursday) 10:30~12:00 am**

## Environmental control of the mouse sperm epigenome



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### Abstract:

In addition to delivering a haploid genome complement to the next generation, it is increasingly clear that sperm also carry a payload of so-called epigenetic information that can influence health and disease in offspring. Moreover, a growing literature links paternal environmental exposures to a wide range of phenotypes in the next generation, demonstrating that the sperm epigenome is plastic and can be regulated by environmental conditions. Our lab has a longstanding interest in the mechanistic basis underlying paternal effects in mouse. In this seminar, I will briefly frame our research program but will primarily focus on two updates to these efforts. In the first, I will describe an ongoing exploration of the molecular details of the mouse sperm epigenome. Specifically, I will highlight our recent findings that up to hundreds of prior measurements of mouse sperm chromatin, DNA modification, and RNA payload suffer from substantial flaws, and will describe our attempts to more accurately elucidate the molecular payload of mature spermatozoa. In the second, I will discuss our efforts to understand how environmental conditions are sensed in the paternal generation, focusing on the question of cell non autonomous effects in control of the sperm epigenome. Finally, if time allows, I will briefly touch on functions of the sperm epigenome in the preimplantation embryo.

Zoom link: <https://riken-jp.zoom.us/j/95620241989>

Lab HP: <https://www.umassmed.edu/randolab/>

### Reference:

Revisiting chromatin packaging in mouse sperm

bioRxiv 2022.12.26.521943; doi: <https://doi.org/10.1101/2022.12.26.521943>

Evidence for RNA or protein transport from somatic tissues to the male reproductive tract in mouse

bioRxiv 2022.02.08.479624; doi: <https://doi.org/10.1101/2022.02.08.479624>

Small RNAs Are Trafficked from the Epididymis to Developing Mammalian Sperm

Dev Cell 2018; 46(4):481-494.e6. doi: 10.1016/j.devcel.2018.06.023

Biogenesis and function of tRNA fragments during sperm maturation and fertilization in mammals

Science 2016; 351(6271):391-396. doi: 10.1126/science.aad6780.

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Please contact the host if you'd like to personally discuss with the guest after the seminar.