Hunter College of the City University of New York
Department of Biological Sciences
Fall 2023 Inga Richter Seminar Series

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Black Family Stem Cell Institute

Launching the next generation: Nuclear and cytoplasmic reprogramming during germ cell to maternal transition

The overarching goal of our research program is to discover how germ cells achieve immortality. In multicellular organisms, all somatic cells accumulate damage and eventually die. Molecular mechanisms of aging are similar across somatic cells. Interventions that reverse or mitigate cellular damage can have enormous therapeutic potential. In contrast to somatic cells, germ cells, which give rise to gametes (oocyte and sperm), escape aging. Irrespective of the parents' age, the gametes always ensure that the next generation starts afresh. Gametes launch the next generation by supplying cellular components to the zygote. The mature oocyte donates a haploid genome and the "maternal contribution" of RNAs, proteins, and organelles. The oocyte's maternal contribution is required to launch the next generation and sufficient to reprogram a somatic cell nucleus to totipotency and reset its age. The sperm donates a haploid genome and centrioles. Our research program focuses on deciphering the quality control mechanisms that screen these parental contributions for appropriate components and damage.

https://www.biorxiv.org/content/10.1101/2023.11.15.567233.abstract

Monday, Dec. 11, 2023 @12:30pm
Hunter North Room 926
Host: Diana Bratu