Johns Hopkins University

Department of Biology Seminar Series

Monday, 4:00pm

For more information go to: *https://bio.jhu.edu/events*

Zoom link: *https://zoom.us/j/97925356454?pwd=bjNuTlY1dU9BcXcvRFdleis2TVNadz09*

April 15th, 2024 - Mudd 100

Wei Xie

School of Life Sciences

Tsinghua University, Beijing, China

Host: Xin Chen

"Decoding the transcription circuitry when the life begins"

Drastic transcription and epigenetic reprogramming occur during mammalian zygotic genome activation (ZGA). Deciphering key regulators of ZGA is crucial for understanding how life really begins and how a totipotent embryo arises from terminally differentiated gametes. Probing these questions in mammals was long hindered by the scarce experimental materials that are available from early embryos. By developing a set of ultra-sensitive chromatin analysis technologies, we previously investigated chromatin accessibility, epigenetic modifications, 3D chromatin architecture, and RNA Pol II engagement during mammalian ZGA. These studies unveiled extensive resetting of the epigenetic memories and the highly dynamic and non-canonical transcription and chromatin regulation during the maternal-to-zygotic transition. Recently, we also sought to identify key transcription factors that may instruct the establishment of embryonic programs from ZGA to the first lineage specification. We further investigated how these key TFs function in early development to control genome activation and totipotency-topluripotency transition by engaging cis-regulatory elements. In this talk, I will discuss how these findings help us understand the molecular mechanisms underlying early mammalian embryogenesis and the key circuitry controlling how the life begins.