FASSBERG SEMINAR SERIES

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special date & time

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Epigenetic mechanisms in early mammalian development

A fundamental question in biology is to understand the mechanisms underlying cellular plasticity. This plasticity or potency is the ability of a cell to give rise to multiple cell types upon differentiation. In mammals, following fertilization and fusion of the gametes –two highly differentiated cells- intense chromatin remodeling and epigenetic reprogramming are necessary for the reversion to an undifferentiated state to restore full developmental potency (totipotency). Subsequent development and differentiation are accompanied with progressive loss of potency. Research in my lab focuses on understanding how chromatin regulates cell plasticity, cell fate and reprogramming using the early mouse embryo as a model system. In particular, we are interested in determining how the structure of the chromatin is established at the beginning of development to enable totipotency, and how this structure is remodelled during pre-implantation development, to give rise to pluripotency. Ultimately, this will allow us to underscore the mechanisms behind totipotency and epigenetic reprogramming. Remarkably, we have found that specific features of embryonic chromatin are also present in totipotent-like cells in vitro. Based on this, we have begun to decipher key molecular regulators of repetitive elements in the embryo. Our results have identified candidate proteins that regulate chromatin function and expression of these elements and show that they can induce totipotent-like cells in vitro. I will discuss our recent contributions documenting how the embryonic epigenome is shaped by heterochromatin and by the activity of retrotransposons, and their implication in establishing totipotency.

Host: Melina Schuh

Thursday / 12.12.2019 / 13:00

Max Planck Institute for Biophysical Chemistry
Large Seminar Room / Administration Building