CDB SEMINAR

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Tuesday, July 9, 2013
10:00~11:00 C1F Auditorium

Surviving pluripotency. Who picks who will live and who will die in the early mammalian embryo?

Summary

The early mammalian embryo is made up of pluripotent stem cells that have the ability to contribute to all the cell types of the fetus, including the germ line. Much effort has been invested in understanding the signals and transcription factors that regulate the differentiation of these pluripotent cells. In contrast to this what mechanisms exist to detect and eliminate defective stem cells before they can contribute extensively to the embryo or to the germ line remains unresolved. In this talk I will discuss how stem cell fitness is monitored, both by cell autonomous as well as by cell non-autonomous mechanisms. I will present data supporting the notion that upon the onset of differentiation cells become primed for cell death, and that microRNAs are key to maintaining the balance between cell survival and apoptosis once this priming occurs. I will also discuss our experiments that identify how at the tissue level competitive interactions monitor the relative fitness of embryonic stem cells and eliminate those cells that are deemed unfit. This provides a second checkpoint to detect stem cells with mutations that although do not adversely affect their viability, would compromise their ability to contribute to further development. Together, the combination of these mechanisms not only allow for recognition and elimination of vulnerable, mispatterned or abnormal stem cells during early development but are also likely to play general roles in tissue homeostasis and stem cell maintenance.

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