第 416 回つくば分子生命科学セミナー

TSUKUBA MOLECULAR LIFE SCIENCE SEMINAR

Title : Transcription factors in balance and the transition between pluripotent states.

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Date : Oct 14, 2015　17:00-18:30

Venue : Seminar Room 411 (Igakukei-tou 4th floor)

Abstract :

Pluripotent cells have the ability to originate every adult cell type, including germ cells. Pluripotency is governed by a network of transcription factors centred on Nanog, Oct4 and Sox2 and can be captured *in vitro* by deriving embryonic stem cells (ESCs) from the early mouse embryo. Nanog levels in ESCs generate different pluripotent states, with high-Nanog cells more prone to self-renewal and low-Nanog cells more prone to differentiation.

Similarly but in an opposite direction, reduced Oct4 expression in ESCs defines a robust pluripotent state, with increased sensitivity to self-renewal stimuli, decreased sensitivity to differentiation cues and a higher enrichment for Oct4 at specific enhancer sequences in the genome. We investigated the dependence of these cells on extra-cellular signalling pathways and we excluded the role of Wnt signalling in supporting this robust state. Finally, we functionally examined some of the enhancer sequences that showed increased Oct4 enrichment upon overall decrease of Oct4 protein concentration, aiming at understanding the mechanisms behind this molecular paradox.

These data demonstrate that pluripotency does not merely depend on the presence/absence of key transcription factors. On the contrary, fine-tuning of their expression level is required to regulate transitions between pluripotent states.

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