



QBIC SEMINAR

Speaker

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Center for iPS Cell Research and Application (CiRA), Kyoto University

Date &
Location

**Friday, August 23, 2013
13:30 - 14:30**

OLABB 3F Conference Room 6-2-3, Furuedai, Suita, Osaka 565-0874, JAPAN

*There will be a video broadcast in CDB Bldg.D, E-206

Title

Transcription factors interfering with dedifferentiation induce cell type-specific transcriptional profiles

Abstract

Transcription factors (TFs) are able to regulate differentiation-related processes, including dedifferentiation and direct conversion, through the regulation of cell type-specific transcriptional profiles. However, the functional interactions between the TFs regulating different transcriptional profiles are not well understood. Here, we show that the TFs capable of inducing cell type-specific transcriptional profiles prevent the dedifferentiation induced by TFs for pluripotency. Of the large number of TFs expressed in a neural-lineage cell line, we identified a subset of TFs that when overexpressed, strongly interfered with the dedifferentiation triggered by the procedure to generate induced pluripotent stem cells (iPSCs). This interference occurred through a maintenance mechanism of the cell type-specific transcriptional profile. Strikingly, the maintenance activity of the interfering TF set was strong enough to induce the cell line-specific transcriptional profile when overexpressed in a heterologous cell type. In addition, the TFs that interfered with dedifferentiation in hepatic-lineage cells involved TFs with known induction activity for hepatic-lineage cells. Our results suggest that dedifferentiation needs to suppress a cell type-specific transcriptional profile, which is primarily maintained by a small subset of TFs capable of inducing direct conversion. We anticipate that this functional correlation might be applicable in various cell types and might facilitate the identification of TFs with induction activity in efforts to understand differentiation.

Host

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