



QBIC SEMINAR

Speaker

Kazuhiro Yagita, PhD

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Date &
Location

**Tuesday, March 18, 2014
16:00 - 17:00**

the Conference Room on the 3rd floor, OLABB
(6-2-3, Furuedai, Suita, Osaka 565-0874)

*There will be a video broadcast in CDB Seminar Room A2F

Title

Mechanistic Interaction between the Circadian Clock and Cellular Differentiation

Abstract

The molecular oscillations underlying the generation of circadian rhythmicity in mammals develop gradually during ontogenesis. However, developmental process of mammalian cellular circadian oscillator formation has been unclear. Most of the somatic cells in mammalian body contain their own circadian oscillator in each cell. Here, using bioluminescence imaging system to monitor clock gene expression, we show that the circadian bioluminescence activity rhythm is not detected in the mouse embryonic stem (ES) cells, whereas the apparent circadian clock oscillation is induced during the differentiation culture of mouse ES cells without maternal entraining factors. In addition, when those differentiated cells are reprogrammed by expressing Sox2, Klf4, Oct-3/4 and c-Myc genes, those are used to generate induced pluripotent stem (iPS) cells, the circadian oscillation re-disappeared. These results demonstrate that the intrinsic program controls the circadian oscillator generation during the differentiation process of ES cells *in vitro*. The *in vitro* cellular differentiation and reprogramming system using ES cells and stem cell technology may provide a new strategy to understand the cross-talk mechanisms between circadian system and cellular differentiation system. This line of study may also contribute the understanding of relation between circadian clock disturbance and cancer formation.

Host

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