



NEURO GLOBAL Seminar

Neuro Global Online Seminar

Speaker

Miki EBISUYA, Ph.D

Group Leader

EMBL Barcelona



Title

**SYNTHETIC DEVELOPMENTAL BIOLOGY:
Cross-species comparison and manipulation of organoids**

Date / Venue

29 November, 2021 (Monday) 16:00-17:30 ONLINE

Registration

Refer to the message from the NGP office

Related Website

<https://www.embl.org/groups/ebisuya/>

●Neuro Globalプログラム生(Neuro Global Program Students)

【脳科学セミナーシリーズEx】/【先進脳科学セミナーシリーズEx】セミナー1ポイント

【Brain Science Seminar Series Ex】/【Advanced brain science seminar series Ex】1 point

●医学系研究科(Graduate School of Medicine)

【医学履修課程】国際交流セミナー(アドバンスド講義科目) (出席1回分)

【Medical Science Doctoral Course】International Interchange Seminar (Advanced Lecture course) (It will be counted as 1 attendance.)

●生命科学研究科(Graduate School of Life Sciences)

【単位認定セミナー】

単位認定セミナーとして2ポイントを付与します。

【Credit-granted seminar】

2 point will be granted to the students who will attend this seminar.

東北大学 Neuro Global 国際共同大学院プログラム事務局
info@neuroglobal.tohoku.ac.jp
<http://www.neuroglobal.tohoku.ac.jp>

Contact: Prof. Noriko Osumi
[osumi@med.tohoku.ac.jp]

NEURO GLOBAL
Tohoku University



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Abstract

While mechanisms of embryonic development are well conserved among mammals, the progression speed tends to be slower in larger species. To study differences in time between species, my group uses in vitro systems. We have recently recapitulated the segmentation clock, oscillatory gene expression during early development, from human and mouse pluripotent stem cells. The oscillation period of the human segmentation clock is 5-6 hours, while the mouse period is 2-3 hours. We found that this period difference between species stems from slower biochemical reactions in human cells, including slower protein degradation and longer delays in gene expression processes. Now we are extending this approach of cross-species comparison to other mammalian species, including cows and rhinos, and other developmental processes. In parallel, we develop genetic tools to manipulate developmental processes and organoids.

Reference

1. Martínez-Ara G et al., bioRxiv, doi: <https://doi.org/10.1101/2021.04.20.440475> (2021).
Optogenetic control of apical constriction induces synthetic morphogenesis in mammalian tissues.
2. Matsuda M et al., Science, 369, 1450-1455 (2020).
Species-specific segmentation clock periods are due to differential biochemical reaction speeds.
3. Matsuda M et al., Nature, 580, 124-129 (2020).
Recapitulating the human segmentation clock with pluripotent stem cells.