

IMEG Seminar Series

The road to global science

Dr. Vikas Trivedi Group Leader, EMBL Barcelona

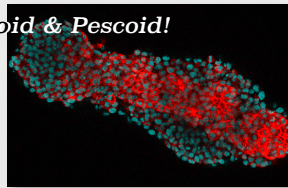


June 22nd, 2021, 16:00~17:00

“Axial organization in animal development: a synthetic approach”

This seminar series is for students, postdoc, and all researchers in Kumamoto University. Check your email box and find the Zoom ID and password !!

Gastruloid & Pescoid!



Abstract

Emergence of multicellular forms (tissues, organs and organisms) from cells through changes in their shape, size, number and organization is central to understanding the process of morphogenesis. While molecular players are known, we do not know how the activity of genes and proteins is translated into 3D structures in space and time. Preexisting spatial cues, species-specific geometry and extraembryonic signaling centers, confound studying these processes in vivo. It has been shown that 3D cell aggregates from different species (mouse embryonic stem cells and zebrafish blastula cells, which we term *gastruloids* and *pescoids* respectively) generate spatial asymmetries in gene expression and cell behavior within otherwise equivalent groups of cells, to develop a global coordinate system (body axes) *de novo*. Combining light-sheet imaging with genetic labelling of cells we are now gaining some insights into the spatio-temporal precision and species-independent manner, with which such 3D embryonic cell aggregates generate the major body axes even in the absence of any embryonic information. Using these embryonic organoids, as a minimal alternate system, sufficient to generate embryonic axes, we aim to understand early development in embryos as an emergent phenomenon of the self-organization of pluripotent cells.

You must be fascinated by ...

Embryonic organoid

Pescoid and gastruloid are embryonic organoids generated from zebrafish and mouse embryonic stem cells. The artificial embryos may have the default development program that we can't see in a real embryo.

Tissue engineering

Dr. Trivedi is trying to understand how cells self-organize from a physics point of view. Organoids are amenable models to address the question.

EMBL Barcelona

This is the newest branch of EMBL with visionary programs.

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