



QBiC CDB JOINT SEMINAR

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Date & Location

Tuesday, April 11, 2017

15:00 - 16:00

QBiC Bldg. A 3F seminar room

(6-2-3, Furuedai, Suita, Osaka)

There will be a TV broadcast at RIKEN Kobe CDB seminar room A7F

Title

Global cell rearrangement during anterior-posterior axis formation in pregastrula mouse embryo

Abstract

After implantation, the embryonic portion of a mouse embryo consists of two monolayer sheets, the epiblast and the visceral endoderm, in a cup-shape structure. The embryos are radially symmetric, with the distal-proximal axis. Cell thickening occurs in the distal visceral endoderm (DVE) at E5.5. The DVE cells express a unique set of genes (AVE genes) encoding transcriptional factors such as *Otx2* and *Hhex*, and signaling antagonists such as *Dkk1*, *Cer1* and *Lefty1*. The expression of AVE genes shifts to the anterior visceral endoderm (AVE) by E6.0, and then the anterior-posterior axis is formed. The shift of the AVE gene expression from DVE to AVE is not due to a change in the cells that express these genes, but due to the movement of the DVE cells. However, it is only DVE cells or part of the visceral endoderm cells that have been analyzed in previous studies. It has remained unclear how other visceral endoderm cells respond to or influence DVE cell movement.

Here we have analyzed the behavior of each visceral endoderm cell with *R26-H2B-EGFP* mouse line that ubiquitously expresses EGFP in the nucleus. Our analyses demonstrated a global, collective cell rearrangement in embryonic visceral endoderm to form AVE. We have also examined the rearrangement with *R26-PHA7-EGFP* mouse line that marks the zona adherence. The analyses revealed that the constriction of apical surface of prospective anterior portion of DVE is associated with the initiation of DVE movement. When DVE cells reached the prospective anterior region, their apical size gradually expanded to the lateral region. These results suggest that the change in their apical size is a driving force of the global cell rearrangement in the visceral endoderm. Our study gives new insights on the mechanism of anterior-posterior axis formation.

Host

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