读书报告1

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Title: Cell Movement Patterns during Gastrulation in the Chick Are Controlled by Positive and Negative Chemotaxis Mediated by FGF4 and FGF8.

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The main conclusion of this article is that cells migrating through the primitive streak are attracted by FGF4 and repelled by FGF8. The expression patterns of *Fgf4* and *Fgf8* are partially overlapping. FGF4 is expressed in Hensen’s node, the primitive streak, the head process and the forming notochord. FGF8 is expressed in Hensen’s node and the anterior part of the streak but excluded from them later in the process of streak extension. Cells in the anterior part of the streak are attracted by FGF4 secreted by the node and the head process, so they move directly toward the anterior terminal of the embryo. Cells in the middle part are repelled by a high level of FGF8 and migrate laterally initially. When Hensen’s node regresses, they start to be attracted by FGF4 and back toward the midline to form somites once the node has regressed past them. Cells in the caudal streak are mainly repelled by FGF8 in the middle streak and not attracted by FGF4 significantly because Hensen’s node doesn’t arrive here.

I chose this article mainly because of its organized logic and good readability. The article introduces the specific and detailed movement trajectories of cells in different parts of the streak, which makes readers who don’t have much knowledge about the chick development (like me) easier to understand the context. Then the article proves that the movements of streak cells are majorly influenced by FGF4 and FGF8 in the surrounding tissues by experiments. The usage of the green fluorescent protein (GFP) visualizes the whole process clearly and makes the experiments more convincing. During the experiments, FGF4/8 beads are used to induce cell movements, which shows the effects of FGF4 and FGF8 clearly. These experimental methods prove the conclusion without complicated charts. For juniors like me, this article provides a good chance to take a deep insight into the chick development.

This article reveals the role of FGF4 and FGF8 in the process of the epithelial to mesenchymal transition (EMT) and the formation of A-P axis in chick embryo. Recent research has found that EMT also plays an important role in the establishment of left/right asymmetry in chicks. At stage 4, as primitive streak elongation terminates but regression has not started yet, cells that form the Hensen’s node exhibit a definitive but brief leftward movement. [[1]](#footnote-1)[1]The movement leads to an asymmetric gene expression pattern and then establishes the left/right asymmetry of chick embryo.

1. [1] Jerome Gros, et al., Cell Movements at Hensen’s Node Establish Left/Right Asymmetric Gene Expression in the Chick. Science 324, 941-944(2009). DOI: 10.1126/science.1172478. [↑](#footnote-ref-1)