

## Miki Ebisuya

Career-Path Promotion Unit for Young Life Scientists, Kyoto University

Thursday, January 24, 2013

13:30~14:30 A7F Seminar Room

### Reconstitution of cell patterns that are driven by Delta-Notch signaling

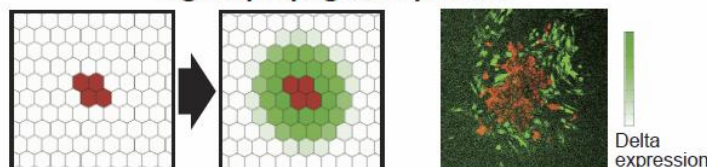
#### Summary

Delta-Notch signaling generates complex cell patterns during development. We have been reconstituting the cell patterns in mammalian cultured cells to understand the mechanisms. In the seminar, I will introduce two cell patterns we have reconstituted so far.

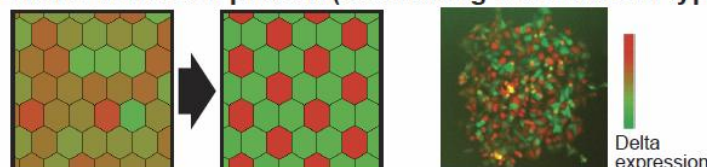
**1. Signal propagation pattern:** This pattern can be seen in the prosensory domain of a developing inner ear. We have created a genetic circuit with which the adjacent cells mutually activate each other's expression of Delta. Then, the Delta expression signal (the green region) propagated to the neighboring cells. Ref: Matsuda, Koga, Nishida & Ebisuya, *Science Signaling*, 5, ra31 (2012).

**2. Lateral inhibition pattern:** This pattern can be seen in a variety of tissues that comprise a balanced mixture of different cell types. We have recently created a genetic circuit with which the adjacent cells mutually inhibit Delta expression. Then, two different cell types (the red and green cells) were successfully generated out of initially homogeneous cells. Interestingly, however, the ratio of the two cell types was a little different from what we had expected based on a mathematical model.

Signal propagation pattern



Lateral inhibition pattern (Generating different cell types)



**Host:**  
**Fumio Matsuzaki**  
 Cell Asymmetry, CDB  
[fumio@cdb.riken.jp](mailto:fumio@cdb.riken.jp)  
 Tel:078-306-3216  
 (ext:1632)