



CDB SEMINAR

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Friday, October 31, 2014

16:00-17:00 Seminar Room A7F

Know Thy Neighbor: The role of contact area geometry on cell-cell signaling

Summary

During development, cells undergo dramatic changes in their morphology. These morphological changes can have a strong influence on the ability of cells to communicate, and ultimately on the differentiation patterns generated in the developing organism. However, very little is known about the effect of cell morphology on cell-cell signaling. In this talk, I will focus on the effect of cell morphology on Notch signaling, which is the canonical juxtacrine signaling pathway in Metazoans, and is often involved in coordinated patterning processes such as lateral inhibition. We use both quantitative experiments and mathematical models to study the role of contact geometry on Notch signaling. We combine micropatterning technology with live cell imaging to track signaling dynamics between pairs of sender and receiver cells in a controlled geometry. We find that the magnitude of signaling correlates with the contact area between the cells. Using a mathematical model we show that such dependence can strongly bias the selection of differentiated cells in lateral inhibition patterning. These results highlight the importance of cell morphology on Notch mediated developmental processes.

Host:

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