
Seminar

Direct cell-cell contacts: defining signal amplification and communication in immune system

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Direct cell-cell interactions are vital for a range of functions in metazoans, and serve a key role in any biological process involving long range cell migration and communication. In the case of the adaptive immune system, cellular recognition depends on direct contacts between cells displaying interaction interfaces. This physical interaction dictates various critical properties of immune cells – in particular, the specificity of cell-cell recognition, as well as the amplification of immune responses to a limited amount of activation stimulus. While the cellular recognition process has been studied in great detail, the process of signal amplification remains poorly characterized. I have investigated the cell-autonomous factors that boost receptor signal, and found that the actin cytoskeleton plays a crucial role in signal amplification and perpetuation within a cell. Furthermore, the same cytoskeletal module also regulates contact pliability to allow cells to switch interaction partners. This may facilitate direct communication and co-ordinate the collective response within the population.

Currently, I am measuring the quantitative outcome of the aforementioned physical interactions at the population level, using a combination of quantitative cell biological and material science tools. The results will illuminate the mechanism underlying a coordinated response of immune cells triggered by a limited amount of spatially confined initial stimulus. Furthermore, I plan to translate these findings to understanding the dysregulation of cell-cell contacts in the context of tumor metastasis and blood clotting, where these interactions drive long range dispersal and confinement.

Thursday, June 26th 2014

11:30 AM (Tea/Coffee at 11:15 AM)

Seminar Hall, TCIS