

Post-doctoral position

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Cell Mechanics and Adhesion

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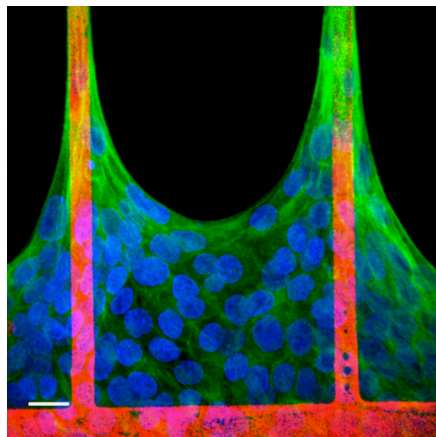
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Controlling collective cell migration with physical cues

Collective cell movements give rise to complex changes in multicellular tissue structures, including epithelial regeneration, morphogenesis, and invasion of cell masses during cancer progression. Mechanical constraints have been shown to influence both *in vivo* and *in vitro* collective migration behaviors. During these processes, cell-cell contacts appear as a key player in the transmission of the mechanical information in the tissue. Previous studies focused either on the mechanical and biochemical processes controlling intercellular junctions at the molecular scale or on the emergence of large-scale coordinated movements. There is now a need to bridge the gap between molecular, cellular and mesoscopic (tissular) scales and to understand the relative contributions of biochemical and mechanical properties emerging at these different scales.



In this multidisciplinary project, we propose: 1) to determine how coordinated movements emerge during collective cell migration, 2) how collective dynamics, mesoscopic behaviors and tissue mechanics are affected by external mechanical properties and finally 3) to dissect the role of adherens junctions and their constituents: cadherin-related proteins and actin.

We propose to develop soft lithography techniques, particle imaging velocimetry (PIV) and mechanical measurements to determine the role of mechanical and geometrical constraints on collective cell migration. Such approaches will be combined with molecular and cell biology techniques to probe the role of cell-cell junctions and cytoskeleton contractility.

We are looking for highly motivated post-docs with an interest in multidisciplinary science. Positions will be related either to experimental approaches (in molecular biology, cell culture, immunofluorescence microscopy, and live cell microscopy and/or in cell biophysics and microfabrication) or modeling (experience in statistical physics, rheology and numerical simulations are highly desirable). This position is opened in 2016 supported by ERC consolidator grant.

Recent References :

Vedula et al. PNAS 2012 ; Vedula et al. Nature Materials 2014 ; Bragues et al. Nature Physics 2014 ; Ravasio et al. Nat Comm 2015 ; Strale et al. J. Cell Biol. 2015 ; Yao et al. Nat Comm 2014.

Collaborations :

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