

LadHyX Seminar – January 28, 14:00

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Consequences of large cell deformations - from nuclear deformation and rupture to loss of cell volume

In the recent years, we have focused our work on studying how cells behave, in terms of migration, growth and division, when they are confined. We found that nuclear deformation, in particular in the context of cell migration through complex environments, can trigger specific signals adapting the acto-myosin migration machinery to the cell environment. We also found that large deformations, for exemple when cells pass through micron size holes, can lead to nuclear envelope rupture and DNA damage. Nuclear deformation can also occur in the context of tumor growth, due to cell crowding. We found that, in this context, nuclear envelope ruptures can lead to DNA damage due to the TREX1 nuclease, and that this contributes to tumor invasion. In a second part of the talk, I will present our recent results focusing on cell volume adaptation during cell shape changes. We found that fast cell deformation is accompanied by volume loss, due to a membrane tension homeostasis mechanism.