LadHyX Seminar – January 9th, 10:45

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Dynamics and mechanics of the cortex of living cells

The cell cortex is a contractile actin meshwork located below the plasma membrane, which determines cell shape and is instrumental for cell mechanics, migration and division. Because the cortical thickness is below optical resolution, it has been generally considered as a thin uniform elastic and contractile layer. Using two mutually attracted magnetic beads, one inside the cell and the other in the extracellular medium, the cortex of live cells can be pinched to probe its physical properties. Accurate and time resolved measure of the thickness of cell cortex revealed a new picture of this structure as highly dynamic, harboring large fluctuations in its third dimension due to actomyosin contractility. We propose that this cortex dynamics plays an essential role in the fast shape changing capacity of highly contractile cells that use amoeboid-like migration. Cortex mechanics is currently studied, showing interesting non linear behavior that seems to be linked to myosin II motors activity.