TIFR Centre for Interdisciplinary Sciences
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Internal Seminar

E-Cadherin Expression and Localization is Correlated to Cellular Softness in Cancer Development

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The epithelial mesenchymal transition (EMT) is believed to play a crucial role not only in beneficial processes like wound healing, but also in cancer development. One of its main markers is the down-regulation of cadherin CD324, or epithelial cadherin (E-Cad). Before heavy general loss of E-Cad in the cell membrane, a restructuring takes place. Anchoring of the actin and keratin cytoskeleton is cut and the amount of mobile E-Cad is increased. It is also strongly suggested, that the malignant transformation of cells is linked to increased softness of the cell body.

To investigate correlations between these two fundamental cellular changes, we use a model system from cell lines, as well as primary human tumor samples. Cells are stained for E-Cad and measured with the Optical Stretcher (OS). In this optical rheometer, cells are deformed non-invasively by a dual beam laser trap. This can be combined with fluorescence microscopy. Thus, both the softness of a single cell as well as the corresponding distribution of E-Cad on the cell surface can be measured simultaneously.

A well-established model for the EMT in cancer development consists of the cell lines MCF 10A, MDA MB 436, and MDA MB 231. Here we show that the loss of E-Cad expression is linked to softer cell bodies. Primary human tumor samples are provided by the Universitätsklinikum Leipzig. Both human mamma and cervix carcinoma are under investigation. The tumor samples are processed into single cell suspensions, depleted of fibroblasts and blood, and measured the same way as the cell line model. We sort the data for cells of high and low E-Cad expression and localization. We show that this way a primary tumor sample can be sorted into two sub-populations of soft and stiff cells.

Wednesday, Oct 5th 2016

12:00 PM (Tea/Coffee at 11:15 AM)

Seminar Hall, TCIS