



From microfluidics to cancer

Open Your Mind Seminar

Friday, Dec 13 2019
1 pm – 2.30 pm

ENSAM
155, Boulevard de l'Hopital
75013 Paris
BEZIER amphitheater

Nuclear fragility drives breast tumor cell invasion

A common type of breast tumor is the duct carcinoma, in which epithelial cells from the duct wall start to proliferate inside the duct lumen. This constitutes the in situ stage of the tumor. As the tumor develops, it will eventually breach the basement membrane of the duct and invade the breast tissue, leading to the invasive stage of the tumor, which is more dangerous and harder to treat. Using a combination of in vitro approaches including microfluidics based 'duct on chip' assay, as well as work in mice and human samples, we were able to propose that DCIS cells (duct carcinoma in situ), as they keep moving and growing, in the confined environment of the duct, rupture their nuclear envelope, leading to DNA damage, which activates the ATM pathway, leading to collagen degradation and invasion. In this talk, I will present our work on migration of immune and cancer cells and describe how our studies of nuclear deformation and rupture in cells migrating through artificial microchannels led us to discover a new mechanism potentially involved at a critical step of breast tumor development.

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