

# Séminaire Général de Physique

## Physics of Tissue Monolayers

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(café-croissants à partir de 9h40)

In the recent years, it has become clear that the coupling between mechanics and growth of tissues plays a major role in various biological processes such as organ development or cancer progression. In this context, this talk reviews our recent results on the physical properties of tissues formed by monolayers of cells. The first part gives a brief introduction to important concepts of the physics of tissues such as the homeostatic pressure and the role of cell division and cell death to fluidize a tissue.

Using these concepts, we then discuss various experiments on tissue monolayers done in the group of P. Silberzan at Institut Curie. For tissues formed by non-polar elongated cells, the cells do not have any spontaneous motility and show a nematic order. We first study orientational defects in the nematic order of the cells. We then show a spontaneous flow instability that leads to a collective movement of the cells on a substrate.

Polar cells have a spontaneous motility that confers different properties to the tissue. We discuss two of these properties: the jamming of the tissue at high cell densities and stem cell differentiation that can lead to a patterning of the tissue.

