CEA - Saclay 91191 Gif-sur-yvette Cedex
Service de Physique de l'Etat Condensé
SÉMINAIRE

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Mercredi 22 février 11h15

Orme des Merisiers SPEC Salle Itzykson, Bât.774

Mechanics and growth of tissues

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We present a mechanical model to describe the growth of healthy and cancerous tissues.

We first show that because of the coupling between cell division and the local stress, a tissue can be considered as a visco-elastic liquid with a relaxation time smaller than the cell division time. We propose a two fluid-model taking into account the interstitial fluid between the cells. We then discuss various instabilities of epithelial tissues that can be of physicological relevance :

-villis are the protrusions of the surface of the intestine or the colon. We describe the formation of villis as a buckling instability of a polar cell monolayer. The polarity of the layer does not seem to play a role in the intestine where the villis are arranged in a square array but it is important in the colon where they are organized in a hexagonal array.

-tubular tissue structures such as arteries or the renal excretory canals show various instabilities also related to buckling

-thick epithelia have a fingering instability of their basement membrane

A coffee break will be served at 11h00. The seminar will be given in English.