Dynamique des cellules tumorales

Présentation du laboratoire

Nom du Laboratoire	Dynamique des cellules tumorales
Acronyme	Inserm U1279
Adresse	Institut Gustave Roussy, Bâtiment de médecine moléculaire, 32 Rue Camille Desmoulins, 94800 Villejuif
Site web	https://www.gustaveroussy.fr
Tutelles	INSERM, Université Paris Saclay, Institut Gustave Roussy
Graduate School(s) de rattachement	CANCÉROLOGIE : BIOLOGIE - MÉDECINE - SANTE (CBMS)
Autres OI d'intérêt	Bioprobe
Directeur du laboratoire	Guillaume Montagnac
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Nom	Prénom	Fonction	Email	Téléphone
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Présentation des équipes de recherche

Équipe 1

Nom de l'équipe	Biologie Cellulaire des Réseaux d'Organites
Site Web de l'équipe	https://www.gustaveroussy.fr/fr/biologie-cellulaire-des-reseaux-organites
Nombre de personnels	1 permanent, 2 post-doc, 1 doctorant

Liste des permanents de l'équipe

Nom	Prénom	Fonction	Email	Téléphone
Schauer	Kristine	DR	Kristine.Schauer@gustaveroussy.fr	0142114129

Activités de recherche en lien avec les nanos

New bottom-up approach to link organelle dynamics to carcinogenesis

We are a highly interdisciplinary team, employing tools from microprinting and *in vitro* biochemical approaches to cell biological imaging and 3D tumoroid culture systems, working on fundamental cellular processes that drive tumorigenesis.

We recently discovered that lysosomes, intracellular organelles involved in various cellular degradation pathways, show major alterations in bladder cancer cells. Activation of lysosomal pathways occurs in several cancers and is associated with increased autophagy and tumor aggressiveness. Lysosomal functions such as resolving the autophagosome during autophagy are tightly linked to membrane deformations and have been shown to depend on actin. Myosin-1s are actin-specific motors that play an important role in membrane deformations and have recently been shown to be involved in autophagy. We are developing a bottom-up approach based on **biochemical reconstitution assays in combination with organelles purified from intracellular compartments to define the function of myosin-1 motors at the lysosomal membrane**. This approach will then be extended to cells in order to link organelle dynamics to autophagosome activation during carcinogenesis. Firstly, we aim to understand the **role of myosin-1 in membrane deformation at the nanometric scale**, using *in vitro* systems with giant lipid vesicles (GUVs). We will then reveal the molecular mechanisms by which myosin-1 deforms lysosome membranes using a hybrid system based on purified lysosomes. Finally, we will manipulate myosin-1 activity in cells using light-controlled optogenetics to study the role of myosin-1 in autophagy. Our project will reveal, at the molecular and cellular levels, the contribution of myosin-1, in association with actin, in membrane deformation and their lysosomal function during autophagy. The mechanisms identified will potentially provide new markers for aggressive cancers

that display activation of lysosomal pathways and could open paths towards molecular drug targets for interfering with autophagy in cancer.

Collaborations sur le plateau de Saclay

Laboratoire	UPS/IPP/Ind	Thème de la collaboration
UMR8214	Paris-Saclay	Measuring membrane tension by TIRF-FLIM

Principales Collaborations nationales

Laboratoire	Institution	Pays	Thème de la collaboration
UMR168	Institut Curie	France	Actin cortex regulation by class I myosin Myo1B
UMR9198	I2BC	France	Actin cortex regulation by class I myosin Myo1C

Principales Collaborations Internationales

Laboratoire	Institution	Pays	Thème de la collaboration
Cellular and Molecular Physiology (Erdem Karatekin)	Yale School of Medicine, New Haven	USA	Role of membrane tension in secretion
IMBECU (Ruben Caron/Anahi Capmany)	University of Mendoza	Argentina	Role of myosins in cell polarity and carcinogenesis during Chlamydia infection
Russell Berrie Nanotechnology Institute (Arnon Henn)	Technion, Haifa	Israel	Unconventional myosins in disease