

SUMMER SEMESTER 2023

RTG 2756 CYTAC SEMINAR SERIES

TUESDAY, MAY 23,
17:15 IN HS5

CYTAC

RTG 2756

CÉCILE SYKES

Team Active Cell Matter

Laboratoire de Physique de l'École Normale Supérieure

CYTOSKELETAL DYNAMICS AND ACTIVITY: ACTIN COMETS,

MEMBRANE DEFORMATIONS, PHASE DIAGRAMS, TRAJECTORIES AND PHASE PORTRAITS

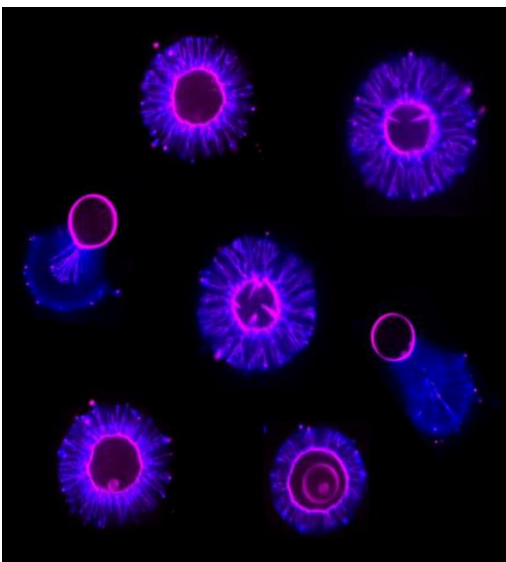


Figure 1: The dynamic actin cytoskeleton is able to deform the membrane inward and outward and propel them through the formation of a comet-like structure. Liposomes have a diameter of 10 to 20 microns.

The physical mechanisms of cell functions such as motility and division can be studied with the use of stripped-down experimental systems composed of a limited number of purified proteins that reproduce cellular behaviours in simplified and controlled conditions. As an example, cytoskeleton dynamics are reproduced on beads, droplets, or liposome membranes (Figure 1). Soft matter variables, such as membrane tension and the structural details of the cytoskeleton architecture are tuned. Movements and deformations can be described by models inspired by soft matter physics and gathered in phase diagrams depending on the parameters of the systems. I will present a few examples including bead motility, inward and outward membrane deformations generated by actin dynamics, and buckling/wrinkling of liposomes under osmotic deflation.