Open internship positions are available on teams websites.

The goal of the unit is to uncover the role of physical laws in the architecture and functions of cellular systems. To this end, the teams follow cross-disciplinary approaches involving physics, chemistry and biology.

Studies cover a breadth of topics ranging from single molecules (molecular motors, DNA-protein interactions, membrane proteins) to cellular functions (cell adhesion, cell division, cell motility, intracellular transport) and the collective behaviour of cells in tissues and organisms (wound healing, morphogenesis). They include the use of many experimental systems going from isolated molecular assemblies and biomimetic systems to cellular and multicellular systems.

The approaches combine theoretical studies - including statistical physics of non-equilibrium systems - and a variety of experimental techniques such as optical and electron microscopy, as well as microfluidics and micropatterning, optogenetics, or mechanical micromanipulation using optical or magnetic tweezers.

Key publications

Year of publication 2020

Aurélie Bertin , Nicola de Franceschi , Eugenio de la Mora , Sourav Maiti, Maryam Alqabandi, Nolwen Miguet, Aurélie di Cicco, Wouter H. Roos, Stéphanie Mangenot , Winfried Weissenhorn, Patricia Bassereau (2020 May 29)

Human ESCRT-III polymers assemble on positively curved membranes and
induce helical membrane tube formation
*Nature Communications*: 11 : 2663 : [DOI](https://doi.org/10.1038/s41467-020-16368-5)

**Year of publication 2019**


**Actin shells control buckling and wrinkling of biomembranes**
*Soft Matter*: 15 : 9647-9653 : [DOI](https://doi.org/10.1039/c9sm01902b)


**Myosin 1b is an actin depolymerase.**
*Nature Communications*: 10 : 5200 : [DOI](https://doi.org/10.1038/s41467-019-13160-y)

Attner MA*, Keil W*, Benavidez JM, Greenwald I (2019 Sep 23)

**HLH-2/E2A Expression Links Stochastic and Deterministic Elements of a Cell Fate Decision during C. elegans Gonadogenesis**
*Current Biology*: 29 : 1-7 : [DOI](https://doi.org/10.1016/j.cub.2019.07.062)

Mathieu Richard, Carles Blanch-Mercader, Hajer Ennomani, Wenxiang Cao, Enrique M De La Cruz, Jean-François Joanny, Frank Jülicher, Laurent Blanchoin, Pascal Martin (2019 Jul 11)

**Active cargo positioning in antiparallel transport networks.**
*Proceedings of the National Academy of Sciences of the United States of America*: [DOI](https://doi.org/10.1073/pnas.1900416116)


**Glutamate spillover in C. elegans triggers repetitive behavior through presynaptic activation of MGL-2/mGluR5**
*Nature Communications*: 10 : [DOI](https://doi.org/10.1038/s41467-019-09581-4)