JOINT MEETING of the
GDRi PHYSICS OF LIVING SYSTEMS and the GRISBI network

Biophysics across scales :
from single molecules to organisms

June 1-3 2015 - Montpellier, France

Invited speakers :

Matthias Rief (Munich)
Harvey Mc Mahon (Cambridge)
Erwin Frey (Munich)
Pietro Cicuta (Cambridge)
Pierre-Francois Lenne (Marseille)
Terence Strick (Paris)
Olivier Thoumine (Bordeaux)
Marco Cosentino Lagomarsino (Paris)

Local Organizing Committee: Emmanuel Margeat (CBS), Vladimir Lorman (L2C), Gladys Massiera (L2C), Pierre Emmanuel Milhiet (CBS), Marcelo Nollmann (CBS), Andrea Parmeggiani (L2C & DIMNP), Francesco Pedaci (CBS)
June 1st

Montpellier School of Medicine – Theatrum Anatomicum

2PM : Welcome address

2:15-3:40PM : «Mechanisms and Mechanics of the Cell»
Chair :

2:15-3:00PM Erwin Frey, Ludwig-Maximilians-Universität München, München, Germany.
«Symmetry Breaking and Pattern Formation in Cellular Systems»

3:00-3:20PM Jean-Baptiste Manneville, UMR 144 CNRS-Institut Curie, Paris.
«Mapping intracellular mechanics on micropatterned substrates»

3:20-3:50PM : Coffee Break

3:50-5:15PM : «Single cells physiology : theory and experiments»
Chair :

3:50-4:35PM Marco Cosentino Lagomarsino, Computational and Quantitative Biology UMR7238 CNRS / UPMC, Paris.
«Fluctuations of size and cell-cycle control in single E. coli cells»

4:35-4:55PM Joachim Rambeau, DIMNP UMR 5235, Montpellier.
«Changing the diet: heterogeneous bacterial cell fates in response to carbon source switching»

«Stochastic self-assembly of ParB proteins nucleated from the centromere builds bacterial DNA segregation apparatus»
5:15-5:45PM : Refreshments break

5:45-7:25PM : «New single molecule methods and applications»

Chair :

 « Correlative approaches in single-molecule experimentation »

6:30-6:50PM Sébastien Balme, Institut Européen des Membranes, Montpellier.
 « Macromolecule sensing by Nanopores »

6:50-7:10PM Laurence Salome, Institut de Pharmacologie et de Biologie Structurale, Toulouse.
 « High-throughput analysis of DNA conformational changes by Tethered Particle Motion on single molecule arrays »

7:15PM : Dinner cocktail at the School of Medicine – Cour d’honneur
June 2nd

*Amphithéâtre Méditerranée – CRDP Canopé*

9:00-10:25: «Cell mechanics and interactions»  
*Chair:*

9:00-9:45AM  **Pierre-François Lenne**, *Institut de Biologie du Développement de Marseille, Marseille.*  
«Mechanics of cell-cell contacts during tissue morphogenesis»

9:45-10:05AM  **Elsen Tjhung**, *Laboratoire Charles Coulomb, Montpellier.*  
«Dynamical first order transition in simple model of cell crawling»

10:05-10:25AM  **Guillaume Saint-martin**, *L2C - INM, MONTPELLIER.*  
«Tissue alterations in spinal cord injured rodent: diffusion magnetic resonance imaging as translational tool.»

10:25-10:55AM: Coffee Break

10:55-12:20PM: «Nucleoproteic assemblies»  
*Chair:*

10:55-11:40AM  **Pietro Cicuta**, *Cambridge*  
«Physical views of bacterial cells: chromosome conformation in E.Coli»

11:40-12:00AM  **Antoine Le Gall**, *Centre de Biochimie Structurale, Montpellier.*  
«The organization and architecture of Bacillus subtilis chromosome revealed by super-resolution microscopy and HiC»

12:00-12:20PM  **Halina Anton**, *Laboratoire de Biophotonique et Pharmacologie, CNRS UMR 7213, Strasbourg, Illirch.*  
«Investigating the cellular distribution and interactions of HIV-1 Nucleocapsid protein by quantitative fluorescence microscopy»
12:30-3:00PM: Lunch at the CRDP with posters session

3:00-4:25PM: « Membrane organization and dynamics »

Chair:

3:00-3:45PM Harvey McMahon, MRC Laboratory of Molecular Biology, Cambridge, UK.
« A New Membrane Trafficking Pathway »

3:45-4:05PM Didier Marguet, Centre d’Immunologie de Marseille Luminy, Marseille.
« Deciphering the cell membrane organization by fluorescence correlation spectroscopy at different length scales »

4:05-4:25PM Laurent Fernandez, Centre de Biochimie Structurale, Montpellier.
« Membrane dynamics and partitioning of CD9 and CD81 are differentially regulated by the actin network »

4:25-4:45PM: Coffee Break

4:45-5:15PM: "Recreation-Time": Opening to Games

Chair:

Chiara Mocenni, Dept Inf. Eng. and Science, Siena.
« Game Interactions and Dynamics on Networked Populations »

5:15PM: IPOLS BUSINESS MEETING

FREE EVENING
June 3rd

Amphitheatre Mediterannée – CRDP Canopé

9:00-9:45: « Cell dynamics and motility »
Chair:

9:00-9:45AM Olivier Thoumine, Interdisciplinary Institute for Neuroscience, Bordeaux.
“Mechanical coupling between actin flow and N-cadherin adhesion in neuronal motility”

9:45-10:05AM Viviana Clavería, Centre de Biochimie Structurale, Montpellier.
“Clustering of red blood cells under flow conditions”

10:05-10:25AM Ashley Nord, Centre de Biochimie Structurale, Montpellier.
“Manipulation of the bacterial flagellar motor with magnetic tweezers”

10:25-10:55AM: Coffee Break

10:55-12:40: « Structure, folding, and dynamics »
Chair:

10:55-11:40AM Matthias Rief, Physikdepartment der Technischen Universität, München, Germany.
“Single Molecule Mechanics of Adenylate Kinase”

11:40-12:00AM Remy Sounier, Institut de Génomique Fonctionnelle, Montpellier.
“Propagation of conformational changes during µ-opioid receptor activation”

12:00-12:20AM François Richard, CRBM, Montpellier.
“Repeat or not repeat in protein sequence? 3D structure as a decision criterion.”

12:20-12:40AM Alessandro Barducci, EPFL, Lausanne, Switzerland.
“Hsp70 chaperones as non-equilibrium machines: ultra-affinity by energy consumption”

12:40: Concluding Remarks, Talks and Poster prizes and departure.