



Quantitative Approaches to Living Systems

AQV days

20-22 January 2021
On line, GMT+1

Invited speakers

Alexander Aulehla
(EMBL, Heidelberg)

Edouard Hannezo
(Institute for Science and Technology, Vienna)

Franziska Lautenschläger
(Center for Biophysics, Saarbrücken)

Emma Slack
(ETH, Zürich)

David Zwicker
(MPI for Dynamics and Self-Organization, Göttingen)

+ selected talks from abstracts

Information and registration:
<https://tinyurl.com/gdraqv>



SCAN ME



Organizers: Nicolas Borghi, Francis Corson,
Nicolas Desprat, Marina Bez, Christophe Le Clainche,
Cécile Leduc, Marc Lefranc, Florence Niedergang,
Renaud Poincloux, Véronique Proux-Gillardeaux, Anne-Cécile Reymann



Images: Nicolas Desprat, Fabrice Guéret, Stéphane U. Rigaud, Floris Bosveld

ALL PRESENTATIONS WILL BE RECORDED

Wednesday, January 20th

- 13⁰⁰-13¹⁵ **Introduction**
Presentation of the AQV GDR by Florence Niedergang and Marc Lefranc
- Session "Active matter"*
Chair: Christophe Le Clainche – Olivia Du Roure
- 13¹⁵-13³⁰ **Francoise Brochard** (Institut Curie LPCC, Paris)
"Granular active matter: Mixture of inert particles and living cells"
- 13³⁰-13⁴⁵ **Clément Campillo** (LAMBE, Evry)
"Morphology and mechanics of membrane nanotubes interacting with reconstituted actin networks"
- 13⁴⁵-14⁰⁰ **Nicolas Levernier** (University of Geneva, Geneva)
"Spontaneous formation of chaotic protrusions in the actin cortex"
- 14⁰⁰-14¹⁵ **Alphée Michelot** (IBDM, Marseille)
"A functional family of fluorescent nucleotide analogues to investigate actin dynamics and energetics"
- 14¹⁵-14³⁰ **Samuel Bell** (Institut Curie PCC, Paris)
"Epithelial monolayers as active gels on curved surfaces"
- 14³⁰-14⁴⁵ **Break**
- 14⁴⁵-15¹⁵ **Invited Speaker : Alexander Aulehla** (EMBL)
"Collective signalling oscillations in embryonic patterning"
- Session "New insights into the nucleus"*
Chair: Florence Niedergang – Nicolas Borghi
- 15¹⁵-15³⁰ **Malèke Mouelhi** (ILM, Lyon)
"Long-term nuclear regulation under confinement"
- 15³⁰-15⁴⁵ **Daniel Jost** (LBMC, Lyon)
"Live imaging and biophysical modelling support a button-based mechanism of somatic homolog pairing"
- 15⁴⁵-16⁰⁰ **Emmanuèle Helfer** (CINAM, Marseille)
"Cell mechanics in premature aging disease"
- 16⁰⁰-16¹⁵ **Break**
- Session "Physics of microbes and immunity"*
Chair: Nicolas Desprat – Marina Elez
- 16¹⁵-16³⁰ **Wafa Ben Youssef** (LJP, Paris)
"Oxygen spatio-temporal distribution in a 4-species adherent community of bacteria"
- 16³⁰-17⁰⁰ **Invited Speaker : Emma Slack** (ETH Zürich)
"Understanding immunological control of intestinal bacteria"
- 17⁰⁰-18⁰⁰ **Poster Session 1**

Thursday, January 21st

9⁰⁰-9³⁰ **Invited Speaker: Franziska Lautenschläger** (Center for Biophysics Saarbrücken)
"Immune Cell Migration (and Mechanics) "

Session "Cell mechanics and migration"

Chair : Veronique Proux-Gillardeaux – Renaud Poincloux

9³⁰-9⁴⁵ **Guqi Yan** (ILM, Lyon)

"Brillouin light scattering as a probe of water dynamics in tissues subjected to hyperosmotic shocks"

9⁴⁵-10⁰⁰ **Stefano Polizzi** (LOMA, Bordeaux)

"Modelling rupture avalanches in living cells"

10⁰⁰-10¹⁵ **Hélène Bouvrais** (IGDR, Rennes)

"Coordination of spindle-positioning forces during the asymmetric division of the *C. elegans* zygote"

10¹⁵-10³⁰ **Chloé Roffay** (UNIGE, Genève)

"Active regulation of the passive coupling between membrane tension and cell volumes changes"

10³⁰-10⁴⁵ **Break**

10⁴⁵-11⁰⁰ **Nicole Roselli** (Sapienza University of Rome, Rome)

"Describing Endothelial Cell Elongation on Adhesive Lines: Computations vs. Experiments"

11⁰⁰-11¹⁵ **Jacky Goetz** (INSERM UMR_S1109, Tumor Biomechanics, Strasbourg)

"Tracking and quantifying intravascular events in tumor metastasis"

Session "Biomimetism"

Chair : Cécile Leduc – Marie-Emilie Terret

11¹⁵-11³⁰ **Karin John** (LiPhy, Grenoble)

"Lattice defects induce microtubule self-renewal"

11³⁰-11⁴⁵ **Lorraine Montel** (LJP, Paris)

"Impact of adhesion in static and dynamic packings of biomimetic emulsions "

11⁴⁵-12⁴⁵ **Round table on Transition outside academia**

Chair : Nicolas Borghi – Christophe Le Clainche

12⁴⁵-13⁴⁵ **Lunch**

13⁴⁵-14³⁰ **Physics-bio games**

Chair : Nicolas Desprat – Mathieu Coppey

14³⁰-14⁴⁰ **Sponsor Idylle**

14⁴⁰-15³⁰ **Round table on Transition inside academia**

Chair : Florence Niedergang – Cécile Leduc

15³⁰-15⁴⁵ **Break**

15⁴⁵-16⁰⁰ **Vote for the LOGO of the GDR**

16⁰⁰-17⁰⁰ **Poster Session 2**

17⁰⁰-18⁰⁰ **Poster Session 3**

Friday, January 22nd

9⁰⁰-9³⁰

Invited Speaker: Edouard Hannezo (IST Austria)

"Multiscale feedbacks between fate, geometry and mechanics"

9³⁰-9⁴⁰

Sponsor: Treefrog Therapeutics, Philippe Cohen

"Treefrog : Stem Cells + Encapsulation + Bioreactor = Mass production of cell therapies"

Session "Morphogenesis"

Chair: Anne-Cécile Reymann – Loic Le Goff

9⁴⁰-9⁵⁵

Timothy Saunders (MBI, Singapore)

"Shaping tissues: the role of mechanics across different scales in vertebrate skeletal muscle formation"

9⁵⁵-10¹⁰

Léo Valon (Institut Pasteur, Paris)

"EGFR/ERK mechanical feedback on cell death maintains tissue integrity during morphogenesis"

10¹⁰-10²⁵

Elise Laruelle (IBENS, Paris)

"Unraveling spatial cellular pattern by computational tissue shuffling"

10²⁵-10⁴⁰

Paolo Caldarelli (Institut Pasteur, Paris)

"Role of tissue mechanics in embryonic self-organization"

10⁴⁰-10⁵⁵

Break

10⁵⁵-11²⁵

Invited Speaker: David Zwicker (Max Planck Institute for Dynamics and Self Organization, Germany) "Modeling active droplets inside biological cells"

Session "Update on modelling"

Chair : Francis Corson – Marc Lefranc

11²⁵-11⁴⁰

Jonas Ranft (IBENS, Paris)

"Reciprocal stabilisation of glycine receptors and gephyrin scaffold proteins at inhibitory synapses"

11⁴⁰-11⁵⁵

David Holcman (IBENS, Paris)

"Fast and slow calcium transients in dendritic spines to trigger ER replenishment or depletion"

11⁵⁵-12¹⁰

Jean-Baptiste Masson (Institut Pasteur, Paris)

"Graph neural network approach to anomalous random walks characterisation"

12¹⁰-12²⁵

Barbara Bravi (LP ENS, Paris)

"Modelling antigen presentation and immune recognition with interpretable machine learning approaches"

12²⁵-12⁴⁰

Pierre Sens (Institut Curie, Paris)

"Modelling cellular organelles with non-equilibrium dynamics"

12⁴⁰-12⁵⁵

Conclusive remarks

Poster and presentation prizes