

AQV Days 2024

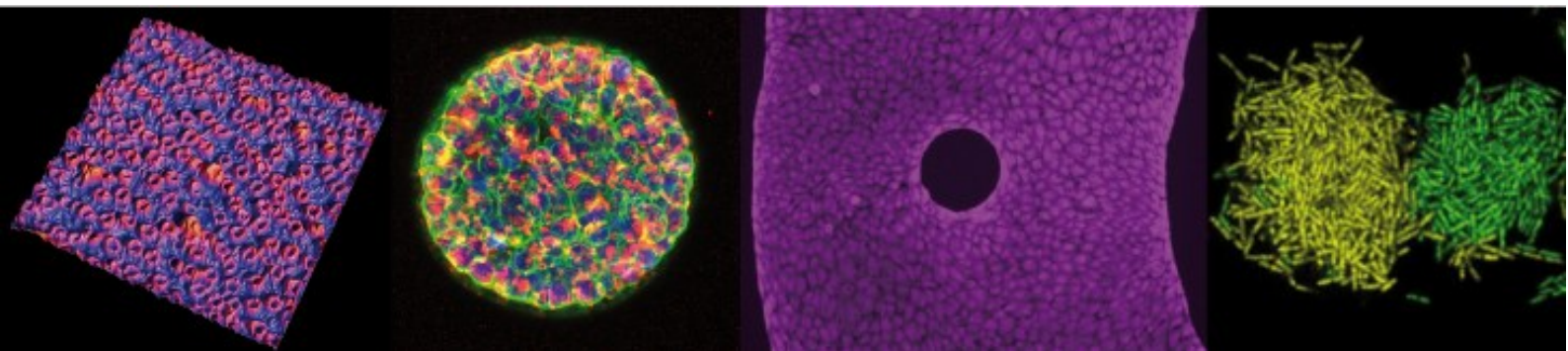
Vogüe, May 15th-17th



approches
quantitatives
du vivant

AQV Days 2024
May 15-17 in Vogüe

Booklet



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OUR SPONSORS



CNRS

The French National Centre for Scientific Research (French: Centre national de la recherche scientifique, CNRS) is the French state research organisation and is the largest fundamental science agency in Europe.

The Company of Biologists

The Company of Biologists is a UK-based charity and not-for-profit publisher that was established in 1925 by George Parker Bidder III with the aim of promoting research and study across all branches of biology. The company publishes currently five scientific journals: Development, Disease Models & Mechanisms, Journal of Cell Science, Journal of Experimental Biology, and Biology Open. As part of its charitable giving, the company awards grants and travelling fellowships to biologists as well as running a series of workshops.



Qlife

Coordinated by Bruno Goud (CNRS - Institut Curie), the Convergences Q-Life Institute brings together 70 teams within PSL to study living systems and predict the future of organisms.



SBCF

The French Society for Cell Biology (SBCF) is the French pool of students and researchers in the domain of Cell Biology. From communicating about the latest breakthroughs to announcing upcoming events, the SBCF also digs up new talents and financially supports young researchers to help them assert their presence in the field. The Society's goal is to promote the scientific area, and be the reference for French research in Cell Biology abroad.



EPJE

Founded by P.-G. de Gennes. European Physical Journal E (EPJE) publishes papers describing advances in the understanding of physical aspects of Soft, Liquid and Living Systems. The journal includes reports of experimental, computational and theoretical studies and appeals to the broad interdisciplinary communities including physics, chemistry, biology, mathematics and materials science.



France Bio Imaging

France-BioImaging is a National Infrastructure in Biology and Health (INBS) laureate in 2011 of the national Program "Investissements d'Avenir" (PIA-ANR) in the field of biological imaging. FBI is at the crossroads between molecular and cell biology, biophysics and engineering, mathematics and informatics.



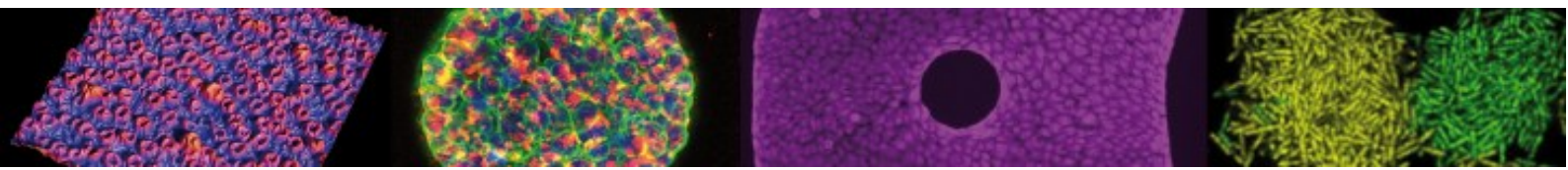
Nikon

Nikon is focused on developing cutting edge imaging technologies for the academic research lab and the biotech and pharma industry, as well as providing the clinical and educational communities with leading imaging solutions.



Idylle

We are the tech transfer platform for the life science tools. We do product development side by side with the researchers who design and use innovative R&D tools.



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SCIENTIFIC PROGRAM

Wednesday May 15th, 2024

13h30 Welcome coffee

14h00 Opening

14h15 Nicolas Biais (Sorbonne Université)
Bacterial Superheroes: An Introduction to Mechano-Micro-Biology

15h00 Camille Bagès (Institut Jacques Monod)
Influence of mechanical constraints on tropomyosin-actin interaction

15h15 Maxime Deforet (Laboratoire Jean Perrin)
DistNet2D: Leveraging long-range temporal information for efficient segmentation and tracking

15h30 Clément Campillo (LAMBE)
Mechanical characterization of oocytes using AFM to evaluate their developmental potential

15h45 Sponsors

16h00 Coffee break

16h30 Saskia Brugere (LPENSL)
Interplay between flux and affinity within biomimetic nuclear pores

16h45 Julien Husson (LadHyX)
Stiffening cells with light

17h00 Amandine Deridouh (Mechanobiology & Biomaterials Lab)
Dynamics of tube feet adhesion and mass-driven adaptation during sea star locomotion

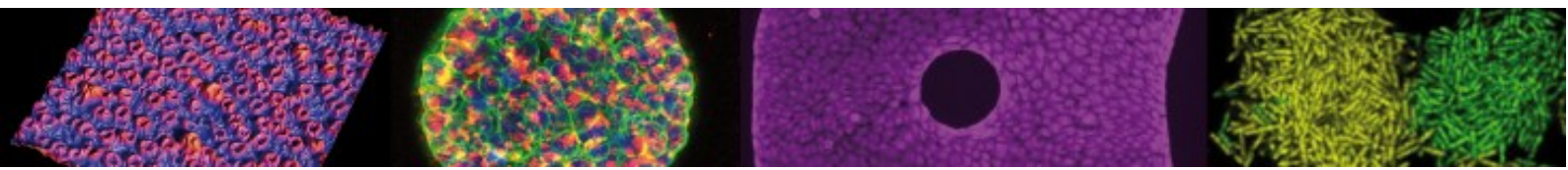
17h15 Rémi Merindol (Laboratoire Charles Coulomb)
Combining strength and dynamics in supramolecular DNA hydrogels

17h30 Dalia Al Arawi (IBDM)
Unraveling the Dynamic Evolution of Tissue Rheology during Gastruloid Self-Organization

17h45 Emily Gehrels (CINaM)
How to create form and dynamics in a living embryo

18h00 Poster Session A

20h00 Diner

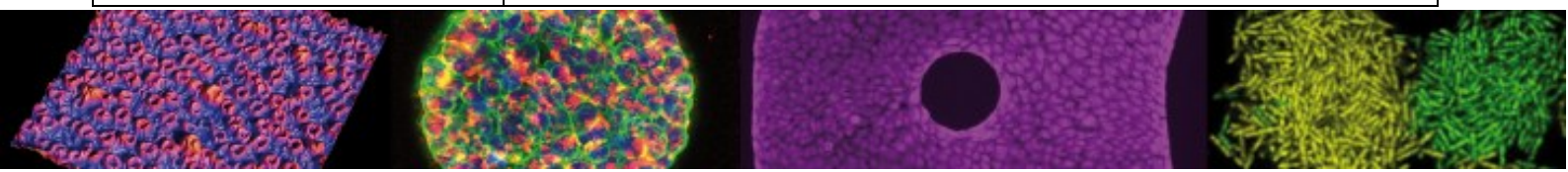


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Poster Session A : Wednesday May 15th, 18h-20h

Besse Marc	Metastability of Uniform-Density Flocks
Anantha Padmanabha Sarma Parvathv	Cooperative dynamics of PARP1 zinc-finger domains in the detection of DNA single-strand breaks
Awada Ahmad	Revisiting Ameoboid Cell Motility: Swimming mediated by membrane treadmilling
Besse Marc	Metastability of Uniform-Density Flocks
Bram Thibault	Roles of cell forces and ECM remodeling on fibrous tissue self-assembly.
Briole Alice	Probing Red Blood Cell stiffness with fluorescent probes : toward new markers of pathology
Bruno Luisa	Lymph node mechanics and its impact on immune cells
Chazot-Franguiadakis Léa	Nanofluidics for the transport of viral particles
Dufour Nicodex Marjolaine	Impact of actin variants on molecular dynamics and cortical mechanical properties in living embryos
Eichelbrenner Jeanne	Mechanical coupling of aECM to the epidermis
Elias Kenny	Nuclear volume reduction under mechanical stress regulates nucleolus.
Ergot Lucie	The extracellular matrix stiffness promotes the invasiveness of breast cancer epithelial cells
Etienne Jocelyn	Friction when changing neighbours: adhesion-regulated junction slippage controls cell intercalation dynamics in living tissue
Faour Sara	Fibroblast persistent migration on soft hydrogel: how substrate stiffness affects cell direction of motion
Fernandez Contreras Aida Gabriela	Cell sensitivity to stiffness in 3D environment with controlled geometry
Fok Yulia	Effects of microbial glycolipids on phospholipid membranes using Atomic Force Microscopy (AFM)
Ghazi Nasser	Hypoxia triggers collective aerotactic spreading of eukaryotic cells
Guigue Quentin	Adhesion differential and mechanical forces applied to emulsion based proto-tissues
Herry Lucie	Biofunctionalization and micropatterning of quantum dots and nanoplatelets for cell nanoimaging
Kefala Georgia	The role of mechano-chemical cues in vertebrate somite generation
Ouazan-Reboul Vincent	Self-limiting self-assembly of particles with complex interactions
Paty Lilian	Vimentin, but not desmin, promotes actin assembly at the barbed end
Pishkari Niloofar	How to Electrically Persuade Cells to Dance to Your Tune
Sorre Benoit	Spatially controlled basal stimulation reveals rules controlling the patterning of human pluripotent stem cells colonies
Uhl Héloïse	Mechanobiology of phagocytosis : force mapping by image analysis
Vasiljevic Olga	Using engineered oil droplets to decipher how the extracellular matrix (ECM) transmits mechanical forces
Versaevel Marie	Mechanoresponse of curved epithelial monolayers lining bowl-shaped 3D microwells



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Thursday May 16th, 2024

9h00 Anne-Florence Bitbol (EPFL)
Optimization and historical contingency in protein sequences

9h45 Thomas Perros (ILM)
Mechanical characterization of regenerating Hydra tissue spheres

10h00 Aurélie Dupont (LiPhy)
Perturbing and modeling the collective behavior of fish schools

10h15 Romain Leroux (Laboratoire Jean Perrin)
Microtubule-based active nematic droplets: from patterns to motion

11h30 Coffee break

11h00 Thomas Sonntag (Centre d'Immunologie de Marseille)
Periodic structural collagens increase the resilience of the extracellular matrix

11h15 Chara Pompili (Institut Cochin)
Phagocytosis via mannose receptor analysed using chemically functionalised & deformable particles

11h30 Chems Amari (Laboratoire Pasteur)
Control of lipid droplet dynamics in cells using engineered condensates

11h45 Valentine Seveau de Noray (Laboratoire Adhésion et Inflammation)
Reverse haptotaxis: Cell migration towards low adhesion

12h00 Sponsors

12h15 Lunch

14h00 Social activity

16h00 Coffee break

16h30 Anna Erzberger (EMBL Heidelberg):
Geometry-driven organisation in living matter

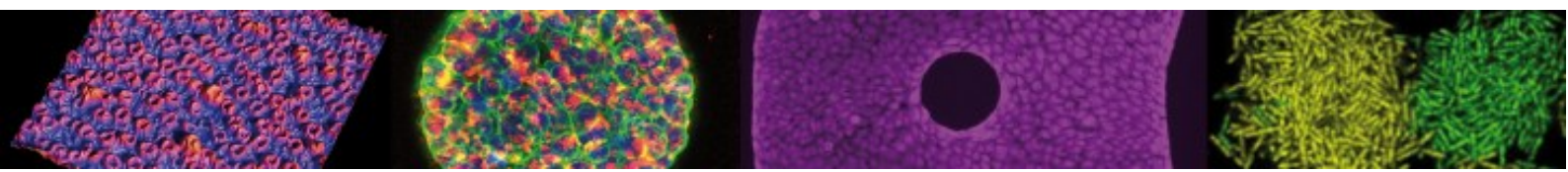
17h15 Aurèle Boussard (Centre de Recherches sur la Cognition Animale)
Effects of conformism in collective decision-making

17h30 Alexandra Colin (CEA)
Scaling of actin architectures

17h45 Pierre Recouvreux (IBDM)
Wnt ligands mobility in *C. elegans* embryos

18h00 Poster Session B

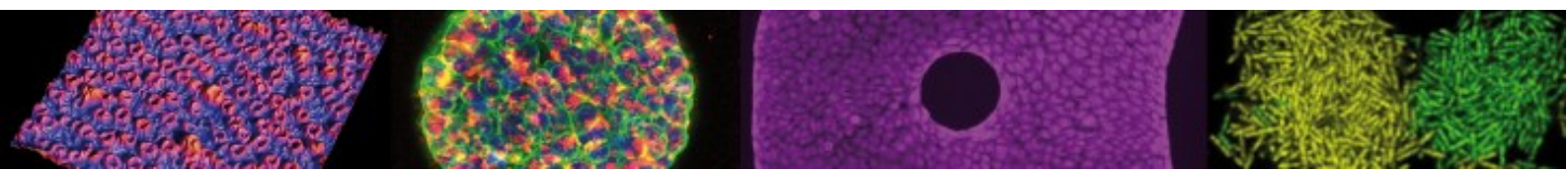
20h00 Diner



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Poster Session B : Thursday May 16 th , 18h-20h	
Barbier Zoé	ERK activation waves and curvature-driven mechanisms in collective cell migration
Boccara Martine	Label-free metabolic imaging and energy costs in Chlamydomonas
Cappello Giovanni	Synchronization of contractions in fibroblast microtissues
Chaveroux Cedric	Soft extracellular matrix drives an endoplasmic reticulum stress-dependent S quiescence underlying molecular traits of pulmonary basal cells
Delarue Morgan	Univversal non-Fickian diffusion properties in the living
Dell'arciprete Dario	Aggregation dynamics in dense suspensions of paramecia
Elhusseiny Jana	Unraveling morphological and biomechanical responses to harsh environmental conditions in coccidian oocysts
Fouchard Jonathan	Stiffening of suspended fibrous micro-tissues by active forces and compressive deformation
Garic Martin	Are the intestinal villi optimally shaped for absorption?
Gehan Pauline	Mechanics of the mesoderm during somitogenesis in chicken embryo
Gérard Kassandra	Nuclear Pore Complexe plasticity
Ghasemi Foad >	Regeneration of branched actin filaments in response to mechanical stress
Ghenni Mathieu	Characteristics of proliferation in a perfused yeast assembly
Huang Lixin	A microfluidic platform to study actin-based membrane remodeling
Kalukula Yohalie	Navigating long confinements requires a switch in cell morphology
Krishnakumar Vishnu	Stretching without breaking: How gut epithelium adapts to mechanical challenges to maintain its integrity
Lobato-Dauzier Nicolas	Confinement determines transport of a reaction-diffusion active matter front
Lorenzetti Enrico	Modelling and Inferring Protein Dynamics in Fission Yeast Mechanosensing
Marquez-Vivas Genesis	Self-sustained velocity waves and pattern emergence in tissues
Nair Nishant	Design of vesicle prototissues with controlled mechanical properties and activity
Nicolas Alice	Quantitative analysis of the mechanical properties of healthy and cancer lung tissue for the design of mechano-mimetic culture substrates
Niedergang Florence	Mechanotransduction in integrin-mediated phagocytosis
Remson Alexandre	Chirotaxis: matrix chirality modulates the cell migration speed
Selma Daniel	Mechanical Stability of Multicellular Assemblies
Vincent Cécile	Molecular transport in 2D biomimetic tissues
Wandersman Elie	Artificial Touch Mechanoreceptors : design, functionalization and mechanical response



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Friday May 17th, 2024

9h00 Daniel Riveline (IGBMC, Strasbourg):
Collective rotations : experiments and theory

9h45 Sophie Pantalacci (LBMC)
A developmental system's view on tooth identity evolution

10h00 Vladimir Misiak (LiPhy)
An *in vitro* epithelial model to measure and manipulate the mechanics of cell-cell junctions

10h15 Ludivine Chaix (Physique des Cellules et Cancer)
Self-organized wave-like beating of actin bundles driven by myosin X motors

10h30 Coffee break

11h00 Mathieu Morel (Laboratoire Pasteur)
Molecular dissection of a genetic AND gate enables predictive design and control of its response function

11h15 Yuthika Shetti (Institute for Advanced Biosciences)
Investigating the dynamic response of nucleolus to static mechanical compression

11h30 Nicolas Desprat (LPENS)
The Min system drives polar secretion of the outer membrane adhesin Ag43 in *E. coli*

11h45 Paolo Pierobon (Institut Cochin)
Mechanics and polarity in B cells

12h00 Closing

12h15 Take away lunch

13h00 Bus departure

