

XII Rencontres du Vietnam

June 26–July 2, 2016

ICISE-Quy Nhon, Việt Nam

# Mechanobiology

from molecules to tissues—theory and applications

<http://rencontresdುವietnam.org/conferences/2016/mechanobiology/>



M. Dahan Institut Curie *France*  
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S. Eaton MPI-CBG *Germany*  
T. Ha Johns Hopkins University *USA*  
S. Horne-Badovinac UChicago *USA*  
M. Kozlov Tel-Aviv University *Israel*  
M. Long Institute of Mechanics *China*  
R. Mayor UCL *UK*  
M. Narasimha TIFR *India*  
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## Speakers

## Organisers

### Sponsors



A. Cavalcanti | Universität Heidelberg | MPI for Intelligent Systems | *Germany*  
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IFOM *Italy*  
Y. Toyama MBI *Singapore*  
J. Yan MBI *Singapore*

Sunday 26 <sup>th</sup>	Monday 27 <sup>th</sup>	Tuesday 28 <sup>th</sup>	Wednesday 29 <sup>th</sup>	Thursday 30 <sup>th</sup>	Friday 1 <sup>st</sup>
			<i>Session 2: Morphogenesis and Mechanics</i>	<i>Session 4: Collective Cell Behavior</i>	<i>Session 5: Control of Cell Shape and Migration</i>
8:30 – 9:00	Welcome	8:30 – 9:15	Dennis Discher	Roberto Mayor	Maxime Dahan
9:00 – 9:25	Conference photograph	9:15 – 9:40	Matthew Raab	Medhavi Vishwakarma	Andreas Carlsson
	<i>Session 1: Force sensing and cell adhesion</i>	9:40 – 10:05	Charlotte Guetta	Chiara De Pascalis	Jean-François Berret
		10:05 – 10:30	<i>Coffee break</i>	<i>Coffee break</i>	<i>Coffee break</i>
		10:30 – 11:15	Mian Long	M. Takeichi	Michael Kozlov
9:30 – 10:15	Michael Sheetz	11:15 – 11:40	Delphine Delacour	Noboru Ishivama	Thomas Stanislas
10:15 – 10:40	Jocelyn Etienne	11:40 – 12:05	Keigi Fujiwara	Dirk Ollech	Tianchi Chen
10:40 – 11:10	<i>Coffee break</i>	12:05 – 12:30		Wang Xi	Hoang Trinh Thao Nguyen
11:10 – 11:35	Nicolas Molinié				
11:35 – 12:00	Morgane Rabineau	12:30 – 14:30	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
12:00 – 12:25	Simon Hans-Georg				
12:30 – 14:30	<i>Lunch</i>				
14:30 – 15:15	Taekjip Ha	14:30 – 15:15	Maithrevi Narasimha	Sally Horne-Badovinac	<i>Session 6: Mechanics of host- pathogen interactions</i>
15:15 – 15:40	Shigenobu Yonemura	15:15 – 15:40	Mitchell Han	Vincent Mirouse	Linda Kenney
15:40 – 16:05	Cristina Bertocchi	15:40 – 16:05	Enrique Martin- Blanco	<i>Break</i>	Guy Tran Van Nhieu
16:05 – 16:30	Poster presentations	16:05 – 16:40	Poster presentations	Joachim Rädler	<i>Break</i>
16:30 – 16:55		16:40 – 16:55		Sandra Citi	Tina Wiegand
16:55 – 17:30		16:55 – 17:30			Summary & Conclusions
18:30 – 20:00	Welcome drink	18:30 – 20:00	<i>Dinner</i>	<i>Conference Dinner</i>	<i>Dinner</i>
20:30 – ...	Poster Beer Session 1	20:30 – ...	Poster Beer Session 2		

# Detailed Programme

## Sunday 26<sup>th</sup>

11:35 - 17:30	Registration
18:30 - 20:00	Welcome drink

## Monday 27<sup>th</sup>

<b>08:30 - 09:00</b>	<b>Welcome</b>
<b>09:00 - 09:25</b>	<b>Conference Photograph</b>

### SESSION 1: FORCE SENSING AND CELL ADHESION

09:30 - 10:15	<b>Michael Sheetz:</b> Molecular-Level Rigidity Sensing in Metastasis
10:15 - 10:40	<b>Jocelyn Etienne:</b> The cell as a liquid motor: intrinsic mechanosensitivity emerges from collective dynamics of actomyosin cortex
<b>10:40 - 11:10</b>	<b>Coffee break</b>
11:10 - 11:35	<b>Nicolas Molinié:</b> Loss of a mechanosensitive checkpoint monitoring branched actin networks in cancer cells
11:35 - 12:00	<b>Morgane Rabineau:</b> Chromatin plasticity directs the fate of healthy cells and cancer cells on soft matrices
12:00 - 12:25	<b>Simon Hans-Georg:</b> Modeling a regeneration-conducive cell environment
<b>12:30 - 14:30</b>	<b>Lunch</b>
14:30 - 15:15	<b>Taekjip Ha:</b> Ultra sensitivity of Cell Adhesion to the Differential Mechanical Cues
15:15 - 15:40	<b>Shigenobu Yonemura:</b> Force-sensing device in alpha $\nu$ -catenin
15:40 - 16:05	<b>Cristina Bertocchi:</b> Nanoscale organization of cadherin-mediated adhesion on biomimetic cadherin substrate
16:05 - 16:30	<b>Poster presentations</b>
<b>18:30 - 20:00</b>	<b>Dinner</b>
20:30 - ...	<b>Poster Beer Session 1</b>

## Tuesday 28<sup>th</sup>

### SESSION 2: MORPHOGENESIS AND MECHANICS

- 08:30 - 09:15 **Suzanne Eaton:** ??
- 09:15 - 09:40 **Wei Yung Ding:** Cortical connectivity provided by plastin is essential for *C. elegans* polarization and cytokinesis
- 09:40 - 10:05 **Yusuke Toyama:** 3D cell shape changes drive *Drosophila* tissue elongation
- 10:05 - 10:30** **Coffee Break**
- 10:30 - 11:15 **Ana-Suncana Smith:** Membrane as a matchmaker for cadherin adhesion
- 11:15 - 11:40 **Delphine Delacour:** Contractile forces at tricellular contacts modulate epithelial polarity and monolayer integrity
- 11:40 - 12:05 **Mikiko Inaki:** Analysis of chiral cellular dynamics in left-right asymmetric rotation of *Drosophila* hindgut
- 12:30 - 14:30** **Lunch**
- 14:30 - 15:15 **Maithrevi Narasimha:** Emergent polarization of cells and cytoskeletal networks induced by physical and chemical cues underlies multicellular sensing and spatial patterning in a *Drosophila* epithelium.
- 15:15 - 15:40 **Mitchell Han:**  $\alpha$ E-catenin-dependent mechanotransduction is essential for proper convergent extension in zebrafish
- 15:40 - 16:05 **Enrique Martin-Blanco:** Mechanics, morphogenesis and evolution of the central nervous system
- 16:05 - 16:40 **Poster presentations**
- 18:30 - 20:00** **Dinner**

## Wednesday 29<sup>th</sup>

### SESSION 3: SINGLE CELL MIGRATION

- 08:30 - 09:15 **Dennis Discher:** From nuclear regulation of 3D migration to DNA damage in cancer
- 09:15 - 09:40 **Matthew Raab:** ESCRT III and Lamin A/C promote nuclear envelope reassembly and survival of cells migrating through confined environments
- 09:40 - 10:05 **Charlotte Guetta:** Protrusive Waves Guide 3D Cell Migration along Nanofibers
- 10:05 - 10:30** **Coffee Break**
- 10:30 - 11:15 **Mian Long:** Mechanobiology of Hepatic Cells in Liver Sinusoid
- 11:15 - 11:40 **Daniel Isabey:** Coupled characterization of cell adhesion and cell mechanics in pulmonary cells remodeled by normal and pathological environments
- 11:40 - 12:05 **Keigi Fujiwara:** PECAM-1 is a mechanosensor of endothelial cells
- 12:30 - 14:30** **Lunch**
- 14:30 - 16:40** **EXCURSION**
- 18:30 - 20:00** **Dinner**
- 20:30 - ... **Poster Beer Session 2**

## Thursday 30<sup>th</sup>

### SESSION 4: COLLECTIVE CELL BEHAVIOR

- 08:30 - 09:15 **Roberto Mayor:** Forces at the front and rear of collective cell migration
- 09:15 - 09:40 **Medhavi Vishwakarma:** Group Decisions influence emergence and regulation of leaders during collective migration of epithelial cells
- 09:40 - 10:05 **Chiara De Pascalis:** Intermediate filaments control astrocyte collective migration through adhesion regulation
- 10:05 - 10:30 Coffee Break**
- 10:30 - 11:15 **Masatoshi Takeichi:** Cortical contractility: a critical regulator of polarized epithelial architecture
- 11:15 - 11:40 **Noboru Ishiyama:** Conformational changes of  $\alpha$ -catenin regulate the cadherin-actin linkage
- 11:40 - 12:05 **Dirk Ollech:** Controlling Cadherin mediated Adhesion using Photocleavable Dimerizers
- 12:05 - 12:30 **Wang Xi:** Collective epithelial migration on 3D confined tubular curvatures
- 12:30 - 14:30 Lunch**
- 14:30 - 15:15 **Sally Horne-Badovinac:** Going in circles gets you somewhere – mechanisms controlling egg chamber elongation in *Drosophila*
- 15:15 - 15:40 **Vincent Mirouse:** Tissue elongation induced by a morphogen-dependent gradient of apical contractility
- 15:40 - 16:05 Break**
- 16:05 - 16:40 **Joachim Rädler:** Cell Migration in Confined Geometries
- 16:40 - 16:55 **Sandra Citi: ??**
- 18:30 - 20:00 Conference Dinner**

## Friday 1<sup>st</sup>

### MORNING SESSION

### SESSION 5: CONTROL OF CELL SHAPE AND MIGRATION

- 08:30 - 09:15 **Maxime Dahan:** Optical and magnetic control of cellular behavior
- 09:15 - 09:40 **Andreas Carlson:** Dynamics of protein patterning in the immunological synapse
- 09:40 - 10:05 **Jean-François Berret:** Magnetic Wires as Viscosity Sensors: Application to Biophysics
- 10:05 - 10:30 Coffee Break**
- 10:30 - 11:15 **Michael Kozlov:** Modeling interplay between protein coat and dynamin ring in membrane budding and fission.
- 11:15 - 11:40 **Thomas Stanislas:** Phospholipids as an actors of the mechanotransduction pathway in the Arabidopsis shoot apical meristem
- 11:40 - 12:05 **Tianchi Chen:** An active actin cytoskeleton confers curvature sensing capability to migrating cells
- 12:05 - 12:30 **Hoang Trinh Thao Nguyen:** FGFR-N-cadherin cross talk and effect on cell-cell contacts stability and migration
- 12:30 - 14:30 Lunch**

**SESSION 6: MECHANICS OF HOST-PATHOGEN INTERACTIONS**

- 14:30 - 14:55 **Linda Kenney:** Mechanobiology of Salmonella Pathogenesis: Gating, Pearling and Tubulation
- 14:55 - 15:20 **Guy Tran Van Nhieu:** Vinculin supra-activation by the Shigella type III invasion effector IpaA
- 15:20 - 15:40 Break**
- 15:40 - 16:05 **Tina Wiegand:** Force measurements of single virus particle uptake
- 16:05 - 17:00 **Summary & Conclusions**
- 18:30 - 20:00 Dinner**

# Participants

Last Name	First Name	Institution	Country
<b>Alibert</b>	Charlotte	Institut Curie	France
<b>Bains</b>	Hari	Musgrave Medical	Australia
<b>Balcioglu</b>	Hayri	Mechanobiology Institute	Singapore
<b>Begnaud</b>	Simon	Institut Jacques Monod	France
<b>Berret</b>	Jean-Francois	Laboratoire Matiere Et Systemes Complexes	France
<b>Bertocchi</b>	Cristina	Mechanobiology Institute	Singapore
<b>Birukov</b>	Konstantin	University of Chicago	USA
<b>Birukova</b>	Anna	University of Chicago	USA
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<b>Carlson</b>	Andreas	University of Oslo	Norway
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<b>Coburn</b>	Luke	University College Dublin	Ireland
<b>Dahan</b>	Maxime	Institut Curie	France
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<b>Doss</b>	Bryant	Mechanobiology Institute	Singapore
<b>Eaton</b>	Suzanne	MPI of Molecular Cell Biology and Genetics	Germany

<b>Etienne</b>	Jocelyn	LIPhy CNRS Univ Grenoble Alpes	France
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<b>Hoang Thi</b>	Kim Hong	Hue University of College	Vietnam
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