

**De Gennes Days, “Physics of Cellular Mechanosensing”
Sunday, January 31 – Wednesday, February 3, 2010**

Registration: 8:30 – 9:30 a.m., Ebner Auditorium, Weizmann Institute of Science

Sunday, January 31 Opening Session		
9:30 – 10:00	Welcome: Haim Garty (Weizmann Institute of Science, Israel) Sam Safran (Weizmann Institute of Science, Israel) Phil Pincus (University of California, Santa Barbara, USA)	Vice-President, Weizmann Institute of Science Co-Chair, Scientific Committee de Gennes Days Conference President, Scientific Advisory Board, de Gennes Foundation
Perspectives on cellular mechanosensing	Chair: Benny Geiger	
10:00 – 10:30	Françoise Brochard-Wyart (Institut Curie, France)	Aspiration of soft objects: From polymersomes to cellular aggregates
10:30 – 11:00	Michael Sheetz (Columbia University, USA, and National University of Singapore)	Sensing of force and rigidity by protein unfolding
11:00 – 11:30	Joachim Spatz (Max Planck Institute for Metals Research and University of Heidelberg, Germany)	Cell adhesion and mechanics
11:30 – 12:00	Coffee break	
12:00 – 12:30	Clare M. Waterman (National Institutes of Health, USA)	Integrating actin dynamics with adhesion during cell migration
12:30 – 13:00	Michel Bornens	The orientation of division in animal cells

	(Institut Curie, France)	
13:00 – 13:30	Alex Mogilner (University of California, Davis, USA)	Actin-myosin treadmill in the membrane bag
14:00 – 16:00	Transportation to the Dead Sea (Box lunch will be provided)	

Sunday, January 31, Afternoon - The Conference continues at the Isrotel Hotel, Dead Sea

Late afternoon	Arrival at the Isrotel Hotel, Dead Sea and check-in	
18:30 - 20:00	Dinner	
Cell-substrate interactions	Chair: Joachim Spatz	
20:00 – 20:30	Dennis Discher (University of Pennsylvania, USA)	Matrix elasticity, stem cells, and how far cells feel
20:30 – 21:00	Assaf Zemel (Hebrew University, Israel)	Mechanical model of self-polarization of cells
21:00 – 21:30	Dror Seliktar (Technion, Israel)	Cells, gels, tissues and issues: Using protein-based hydrogels for 3D cell culture and tissue regeneration
21:30 – 22:00	Pascal Silberzan (Institut Curie, France)	Leader cells in collective cell migration

Monday, February 1		
Actin dynamics in cells	Chair: Michael Elbaum	
9:00 – 9:30	Anne Bernheim (Ben-Gurion University, Israel)	Cooperative effects in motor filament systems
9:30 – 10:00	Jacques Prost (Institut Curie, France)	Violating and restoring the fluctuation-dissipation theorem
10:00 – 10:30	Alexander Bershadsky (Weizmann Institute of Science, Israel)	In search of the functions of Dia1 formin: From cell adhesion to Golgi complex dynamics
10:30 – 11:00	Coffee break	
11:00 – 11:30	Cécile Sykes (Institut Curie, France)	Cytoskeleton dynamics reconstituted at a membrane
11:30 – 12:00	Nathalie Q. Balaban (Hebrew University, Israel)	Single-cell growth variability: Causes and consequences
12:00 – 12:30	David Bensimon (Ecole Normale Supérieure, France)	Optical control of protein activity in single cells
12:30 – 13:00	Antoine Triller (Ecole Normale Supérieure, France)	Molecular diffusion and synaptic plasticity
13:00 – 16:00	Lunch and poster session	
Cytoskeleton and cell migration	Chair: Jean-François Joanny	
16:00 – 16:30	Kinneret Keren (Technion, Israel)	The interplay between actin meshwork dynamics and membrane tension in motile cells
16:30 – 17 :00	Itay Rouso (Weizmann Institute of Science, Israel)	Retrovirus-induced remodeling of the host cell's cytoskeleton
17:00 – 17:30	Jean-François Joanny (Institut Curie, France)	Tissue growth and mechanics
19:00 – 20:30	Dinner	

Cellular mechanosensing	Chair: Alexander Bershadsky	
20:30 – 21:00	Pascal Martin (Institut Curie, France)	Active mechanosensation by hair cells from the vertebrate ear
21:00 – 21:30	Bechara Kachar (National Institutes of Health, USA)	Mechanosensory stereocilia functional architecture: Self-renewal and regulation by myosins
21:30 – 22:00	Nir Gov (Weizmann Institute of Science, Israel)	Treadmilling and traffic jams: A theoretical model of the inner workings of stereocilia and other protrusions

Tuesday, February 2 Cell adhesion and the stress response	Chair: Dennis Discher	
9:00 – 9:30	Viola Vogel (ETH, Switzerland)	Mechano-chemical signal conversion by extracellular matrix fibers
9:30 – 10:00	Misha Kozlov (Tel-Aviv University, Israel)	Role of focal adhesions and mechanical stresses in the formation and progression of the lamellipodium – lamellum interface
10:00 – 10:30	Alice Nicolas (Centre National de la Recherche Scientifique, France)	Thermodynamic approach to cell adhesion mechanosensitivity
10:30 – 11:00	Benoit Ladoux (University of Paris, Diderot, France)	Topography and rigidity sensing in cell migration
11:00 – 11:30	Coffee break	
11:30 – 12:00	Ralf Kemkemer (Max Planck Institute, Germany)	Temporal aspects in cellular mechanoresponses
12:00 – 12:30	Christoph Schmidt (Georg-August University, Germany)	Non-equilibrium fluctuations in motor-activated model networks and in suspended cells
13:00 – 17:00	Excursions to nature and historical sites (Box lunch will be provided)	
19:00 – 20:30	Conference dinner	

Mechanics, dynamics and the nucleus	Chair: Michel Bornens	
20:30 – 21:00	G.V. Shivashankar (National Center for Biological Sciences, India)	Mechanotransduction to the nucleus and genome regulation
21:00 – 21:30	Michael Elbaum (Weizmann Institute of Science, Israel)	The nuclear pore: a pump with no moving parts
21:30 – 22:00	Robijn Bruinsma (University of California, Los Angeles, USA)	Integrin-ligand receptor unbinding and quantum mechanics

Wednesday, February 3 Cytoskeletal mechanics	Chair: Anne Bernheim	
8:30 – 9:00	Benny Geiger (Weizmann Institute of Science, Israel)	The molecular architecture of the adhesion machinery of cells
9:00 – 9:30	Ulrich Schwarz (University of Heidelberg, Germany)	Modeling the coupling of mechanics and biochemistry in cell adhesion
9:30 – 10:00	Daniel Navajas (University of Barcelona, Spain)	Mechanical response of pulmonary cells to stretch
10:00 – 10:30	Guy Genin (University of Washington, St. Louis, USA)	Real-time imaging of cytoskeletal responses to mechanical stretch in 3D culture
10:30 – 11:00	Jeffrey J. Fredberg (Harvard University, USA)	A soft cell makes a strong glass
11:00 – 11:30	Erich Sackmann (Technical University of Munich, Germany)	Can physics explain cellular functions?
11:30 – 12:00	Concluding remarks	
12:00	Departure (box lunches will be provided)	