# From Molecules to Organs: The Mechanobiology Of Morphogenesis
## October 28-30, 2020
## Virtual Conference
## PROGRAMME

Updated 28 October 2020

## Day 1: Wednesday, October 28, 2020

| | | |
|---|---|---|
| 1815 - 1830 (Singapore Standard Time) | 1815 - 1820 | **Welcome & Introduction**<br>**Timothy Saunders**<br>***Chair, Organizing Committee, Morphogenesis 2020*** |
| | 1820 - 1830 | **Opening Remarks**<br>**Rong Li**<br>***Director, Mechanobiology Institute, Singapore*** |

| | | Lobby A | | Lobby B |
|---|---|---|---|---|
| | | **Session A1** | | **Session B1** |
| 1830 - 2030 (Singapore Standard Time) | | **Actin Cytoskeleton and Cell Mechanics**<br>***Chair: Alexander Bershadsky***<br>*Mechanobiology Institute, Singapore* | | **Microtubules and Motors**<br>***Chair: Timothy Saunders***<br>*Mechanobiology Institute, Singapore* |
| | 1830 - 1855 | **Ana-Maria LENNON-DUMENIL**<br>**Institut Curie, France**<br>*Impact of Mechanical Stress on Dendritic Cell Migration and Fate* | 1830 - 1855 | **Laurent BLANCHOIN**<br>**CNRS, France**<br>*Microtubule Self-Repair* |
| | 1855 - 1910 | **Kwi Shan SEAH**<br>**National University of Singapore, Singapore**<br>*Morphogenesis of Hierarchical Nanostructures on the Swallowtail Butterfly Wing Scales* | 1855 - 1910 | **Anne STRAUBE**<br>**University of Warwick, UK**<br>*Microtubule Crossbridging Activates Dynein and Increases its Processivity and Force Output* |
| | 1910 - 1935 | **Matthieu PIEL**<br>**Institut Curie, France**<br>*The Actin Cortex in Live Cells* | 1910 - 1935 | **Ivo TELLEY**<br>**Instituto Gulbenkian de Ciência (IGC), Portugal**<br>*Local Ordering of Nuclei in the Drosophila Syncytial Embryo is Driven by Microtubule Aster Repulsion* |
| | 1935 - 1950 | **Sarah BOYLE**<br>**University of South Australia, Australia**<br>*Compressive Forces in Breast Cancer Activate RHO/ROCK-Mediated Cellular Processes Downstream of Piezo1* | 1935 - 1950 | **Aaron J. FARRUGIA**<br>**Mechanobiology Institute, Singapore**<br>*Interplay Between Microtubules and Integrin-Mediated Adhesion in Angiogenesis* |
| | 1950 - 2005 | **Fernando VALENCIA**<br>**University of Toronto, Canada**<br>*Activation of Actin Elongation Factor Dia1 by Mechanical Force Protects the Cytoskeleton from Damage and Facilitates Stress Fiber Repair* | 1950 - 2005 | **Shailaja SEETHARAMAN**<br>**Institut Pasteur, France**<br>*Microtubule Acetylation Regulates Mechanosensitive Cell Responses* |
| | 2005 - 2030 | **Elizabeth H. CHEN**<br>**University of Texas Southwestern, USA**<br>*Mechanical Tension Drives Cell-Cell Fusion* | 2005 - 2030 | **Alexis GAUTREAU**<br>**École Polytechnique, France**<br>*The Arp1/11 Minifilament of Dynactin and the Arp2/3 Complex Join Forces for Endosomal Scission* |
| 2030 - 2130 (Singapore Standard Time) | | **Poster Session** | | |

| | | Session A2 | | Session B2 |
|---|---|---|---|---|
| 2130 - 2315 (Singapore Standard Time) | | **Cell and Tissue Mechanics**<br>***Chair: Tetsuya Hiraiwa***<br>*Mechanogiology Institute, Singapore* | | **Mechanobiology of Cancer**<br>***Chair: Hanry Yu***<br>*Mechanobiology Institute, Singapore* |
| | 2130 - 2155 | **Edwin MUNRO**<br>**The University of Chicago, USA**<br>*Dynamic Coupling of Cell-Cell Signaling, Force Generation and Tissue Remodeling during Neural Tube Closure* | 2130 - 2155 | **Denis WIRTZ**<br>**Johns Hopkins University, USA**<br>*Large Three-Dimensional Maps of the Pancreatic Cancer Microenvironment at Single Cell Resolution* |
| | 2155 - 2210 | **Lakshmi BALASUBRAMANIAM**<br>**Institut Jacques Monod, France**<br>*Nature of Active Forces in Tissues: How Contractile Cells Can Form Extensile Monolayers* | 2155 - 2210 | **Jason LAI**<br>**Mechanobiology Institute, Singapore**<br>*Zebrafish Epidermal Basal Cells Require Yap and Taz to Survive* |
| | 2210 - 2235 | **Alex MOGILNER**<br>**New York University, USA**<br>*Feedbacks Between Mitotic Spindle Mechanics and Geometry Ensure Deterministic Chromosome Biorientation* | 2210 - 2235 | **Yun CHEN**<br>**Johns Hopkins University, USA**<br>*Actomyosin-Dependent Force Generation is Hijacked to Promote Tumor Progression via ECM Remodeling, Immunosuppression and Beyond* |
| | 2235 - 2250 | **Eyal KARZBRUN**<br>**University of California Santa Barbara, USA**<br>*A Reproducible Human Stem Cell System Reveals Neural Tube Morphogenesis* | 2235 - 2250 | **Kalpana MANDAL**<br>**University of Pennsylvania, USA**<br>*Role of a Kinesin Motor in Cancer Cell Mechanics* |
| | 2250 - 2315 | **Sean SUN**<br>**Johns Hopkins University, USA**<br>*Water and Hydraulic Pressure in Cell Dynamics* | 2250 - 2315 | **Danijela VIGNJEVIC**<br>**Institut Curie, France**<br>*Cancer-Associated Fibroblasts use Supracellular Contractility to Compress and Shape Tumors* |

## Day 2: Thursday, October 29, 2020

| | Lobby A | | Lobby B | |
|---|---|---|---|---|
| | **Session A3** | | **Session B3** | |
| 1830 - 2030 (Singapore Standard Time) | **Tissue Shaping**<br>***Chair: Rachna Narayanan***<br>*Mechanobiology Institute, Singapore* | | **Molecular Complexes and Forces**<br>***Chair: Pakorn (Tony) Kanchanawong***<br>*Mechanobiology Institute, Singapore* | |
| | 1830 - 1855 | **Michel LABOUESSEE**<br>**IBPS, Institute of Biology, Paris, France**<br>*Ratchets in Body Morphogenesis* | 1830 - 1855 | **Jie YAN**<br>**Mechanobiology Institute, Singapore**<br>*The Mechanical Stability of Tension-Transmission Molecular Linkages* |
| | 1855 - 1915 | **Yusuke TOYAMA**<br>**Mechanobiology Institute, Singapore**<br>*Mechanical Impact of Apoptosis in Tissue Homeostasis* | 1855 - 1920 | **Christophe LE CLAINCHE**<br>**Institute of Integrative Cell Biology, France**<br>*Understanding Mechanotransduction Through the In Vitro Reconstitution of Actomyosin-Dependent Protein Machineries* |
| | 1915 - 1930 | **Karen KASZA**<br>**Columbia University, USA**<br>*Linking Cell Shapes to Tissue Flows During Morphogenesis* | 1920 - 1935 | **Sam BARNETT**<br>**Mechanobiology Institute, Singapore**<br>*Spatiotemporal Control of Talin-Mediated Mechanotransduction by Inducible Dimerization* |
| | 1930 - 1945 | **Enrique MARTIN-BLANCO**<br>**IBMB (CSIC), Spain**<br>*JNK Signaling in Pioneer Neurons Directs the Architectural Organization of the CNS and Coordinates the Motor Activity of the Drosophila Embryo* | 1935 - 1950 | **Chaoyu FU**<br>**Mechanobiology Institute, Singapore**<br>*Positive Feedback through Cell-Cell Communication and EGFR Activation/Signaling Directs Neighbor Exchange.* |
| | 1945 - 2010 | **Yanlan MAO**<br>**University College London, UK**<br>*Coping with Mechanical Stress: Tissue Dynamics During Growth and Repair* | 1950 - 2015 | **Naoko MIZUNO**<br>**National Institutes of Health, USA**<br>*Building Up Focal Adhesion Machinery* |
| | 2010 - 2030 | **Timothy SAUNDERS**<br>**Mechanobiology Institute, Singapore**<br>*Shaping Tissues: the Role of Mechanics Across Different Scales* | 2015 - 2030 | **Léo VALON**<br>**Institut Pasteur, France**<br>*EGFR/ERK Feedback on Cell Death Maintains Tissue Integrity During Morphogenesis* |
| 2030 - 2130 (Singapore Standard Time) | **Poster Session** | | | |
| | **Session A4** | | **Session B4** | |
| 2130 - 2305 (Singapore Standard Time) | **Mechanotransduction**<br>***Chair: Artem Yefremov***<br>*Mechanobiology Institute, Singapore* | | **Advanced Methods**<br>***Chair: Mario Mendieta-Serrano***<br>*Mechanobiology Insitute, Singapore* | |
| | 2130 - 2145 | **Yuchen LONG**<br>**Laboratoire Reproduction et Developpement des Plantes, Universite de Lyo, France**<br>*Cellular Pressure Heterogeneity by Tissue Hydraulics and Mechanics in a Plant Stem Cell Niche.* | 2130 - 2145 | **Chloé ROFFAY**<br>**University of Geneva, Switzerland**<br>*Passive Coupling of Membrane Tension with Cell Volume Changes is Actively Regulated by mTORC2* |
| | 2145 - 2210 | **Khalid SALAITA**<br>**Emory University, USA**<br>*Mapping Cellular Traction Force Orientation and Magnitude at Super-Resolution using DNA Nanotechnology* | 2145 - 2210 | **Bin WU**<br>**John Hopkins University, USA**<br>*Develop a Very Fast Light Controlled CRISPR-CAS9 for Genome Engineering* |
| | 2210 - 2225 | **Alessia CASTAGNINO**<br>**Ecole Polytechnique, France**<br>*Mechanisms of Endothelial Cell Wound Healing Under Shear Stress* | 2210 - 2225 | **Carlos PEREZ GONZALEZ**<br>**Institut Curie, France**<br>*Mechanical Compartmentalization of the Intestinal Organoid Enables Crypt Folding and Collective Cell Migration* |
| | 2225 - 2240 | **Filipe VICENTE**<br>**Institute for Interdisciplinary Neuroscience, France**<br>*Combining Super-Resolution Microscopy and Cell Stretching to Study Mechanosensing of Integrin Adhesion Sites* | 2225 - 2240 | **Mitchell HAN**<br>**INM Leibniz Institute for New Materials, Germany**<br>*Optoregulated Force Application to Individual Cellular Receptors Using Molecular Motors* |
| | 2240 - 2305 | **Alex DUNN**<br>**Stanford University, USA**<br>*Regulation and Dynamics of Force Transmission at Cellular Adhesion Complexes* | 2240 - 2305 | **Klaus HAHN**<br>**University of North Carolina at Chapel Hill, USA**<br>*Imaging the Conformations of Individual Molecules in Living Cells – Towards Visualizing Forces at the Single Molecule Level* |

## Day 3: Friday, October 30, 2020

| | | Lobby A | | Lobby B |
|---|---|---|---|---|
| | | **Session A5** | | **Session B5** |
| 1830 - 2030 (Singapore Standard Time) | | **Cell-Cell Junctions Regulation**<br>***Chair: Boon Chuan Low***<br>*Mechanobiology Institute, Singapore* | | **Asymmetry and Polarity**<br>***Chair: Yaelim Lee***<br>*Mechanobiology Institute, Singapore* |
| | 1830 - 1855 | **Virgile VIASNOFF**<br>**Mechanobiology Institute, Singapore**<br>*Forget about Bounds. A New Perspective on Cell-Cell Adhesion* | 1830 - 1855 | **Fumio MOTEGI**<br>**Mechanobiology Institute, Singapore**<br>*Symmetry Breaking in C. Elegans Zygotes* |
| | 1855 - 1910 | **Marco CAPITANIO**<br>**University of Florence, Italy**<br>*α-catenin Forms an Unconventional Slip Bond with Actin that Cooperatively Switches into a Catch Bond* | 1855 - 1910 | **Tetsuya HIRAIWA**<br>**Mechanobiology Insitute, Singapore**<br>*Dynamical Pattern Formation of Migrating Cells through Contact Communication* |
| | 1910 - 1925 | **Keng-hui LIN**<br>**Institute of Physics, Academia Sinica, Taiwan**<br>*Medio-Apical Tensions Regulate Tight Junctions in Well-Polarized Madin-Darby Canine Kidney Cells* | 1910 - 1925 | **Maithreyi NARASIMHA**<br>**Tata Institute of Fundamental Research, India**<br>*Myosin Planar Polarisation Modulates Tissue Fluidity and Generate Forces to Enable Coherent Cell Behavior and Cell Field Positioning During Drosophila Germband Retraction.* |
| | 1925 - 1950 | **Li-Kun PHNG**<br>**RIKEN Kobe, Japan**<br>*Endothelial Cell Mechanoresponse to Haemodynamic Forces during Vascular Tubulogenesis* | 1925 - 1950 | **Verena RUPRECHT**<br>**Centre for Genomic Regulation, Spain**<br>*Sensing from the Inside: How the Nucleus Measures Cell Deformation and Controls Migration Plasticity* |
| | 1950 - 2005 | **Qiutan YANG**<br>**Friedrich Miescher Institute, Switzerland**<br>*Cell Fate coordinates Mechano-Osmotic Forces in Intestinal Crypt Formation.* | 1950 - 2005 | **Miguel CONCHA**<br>**University of Chile, Chile**<br>*Epithelial Cell Delamination Links Extraembryonic Tissue Spreading to Progenitor Cell Locomotion in Zebrafish* |
| | 2005 - 2030 | **Kate CAVANAUGH**<br>**University of Chicago, USA**<br>*RhoA Mediates Epithelial Cell Shape Changes and Contractile Asymmetry* | 2005 - 2030 | **Yee Han TEE**<br>**Mechanobiology Institute, Singapore**<br>*Actin Regulators Involved in Establishing Left-Right Asymmetry of Individual Cells and Cell Groups* |
| 2030 - 2130 (Singapore Standard Time) | | **Poster Session** | | |
| | | **Session A6** | | **Session B6** |
| 2130 - 2320 (Singapore Standard Time) | | **New Faces**<br>***Chair: Alexander Bershadsky***<br>*Mechanobiology Insitute, Singapore* | | **New Horizons**<br>***Chair: Timothy Saunders***<br>*Mechanobiology Institute, Singapore* |
| | 2130 - 2155 | **Jennifer YOUNG**<br>**Max Planck Institute for Medical Research, Germany**<br>*Cardiac Mechanobiology as a Function of ECM Stiffness and Nanoscale Ligand Spacing* | 2130 - 2155 | **Satyajit MAYOR**<br>**National Centre for Biological Sciences, India**<br>*Modulation of Membrane Mechanics of the Cell Surface and its Functional Consequences on Integrin Receptor Function* |
| | 2155 - 2210 | **Thuan Beng SAW**<br>**Mechanobiology Insitute, Singapore**<br>*Perpendicular Electric Current Effects on Epithelial Homeostasis* | 2155 - 2210 | **Dennis DISCHER**<br>**University of Pennsylvania, USA**<br>*Heritable Changes to a Cell's DNA Under Mechanical Stress* |
| | 2210 - 2225 | **Anne BEGHIN**<br>**Mechanogiology Institute, Singapore**<br>*Lighting JeWells: Towards an Innovative HCS Platform for Organoids and its Biomedical Applications* | 2210 - 2225 | **Dyche MULLINS**<br>**UCSF School of Medicine, USA**<br>*Coupled Elastic Brownian Ratchets Govern the Force Response of Branched Actin Networks* |
| | 2225 - 2250 | **Andrew HOLLE**<br>**Max Planck Institute for Medical Research, Germany**<br>*Stem Cell Migration and Differentiation in Confining Microenvironments* | 2225 - 2240 | **Sara A. WICKSTRÖM**<br>**Helsinki Institute of Life Science, Finland**<br>*Regulation of Nuclear Architecture by Extrinsic Mechanical Force* |
| | 2250 - 2315 | **Chii Jou CHAN**<br>**European Molecular Biology Laboratory, Germany**<br>*Mechanochemical Feedback Control in Early Mammalian Development* | 2240 - 2315 | **Rong LI**<br>**Mechanobiology Institute, Singapore**<br>*Hydrodynamics Forces in Asymmetric Meiotic Cell Division in Mouse Oocytes* |
| | 2315 - 2320 | **CLOSING REMARKS** | | |

Invited Talk

Selected Short Talk

Poster Session