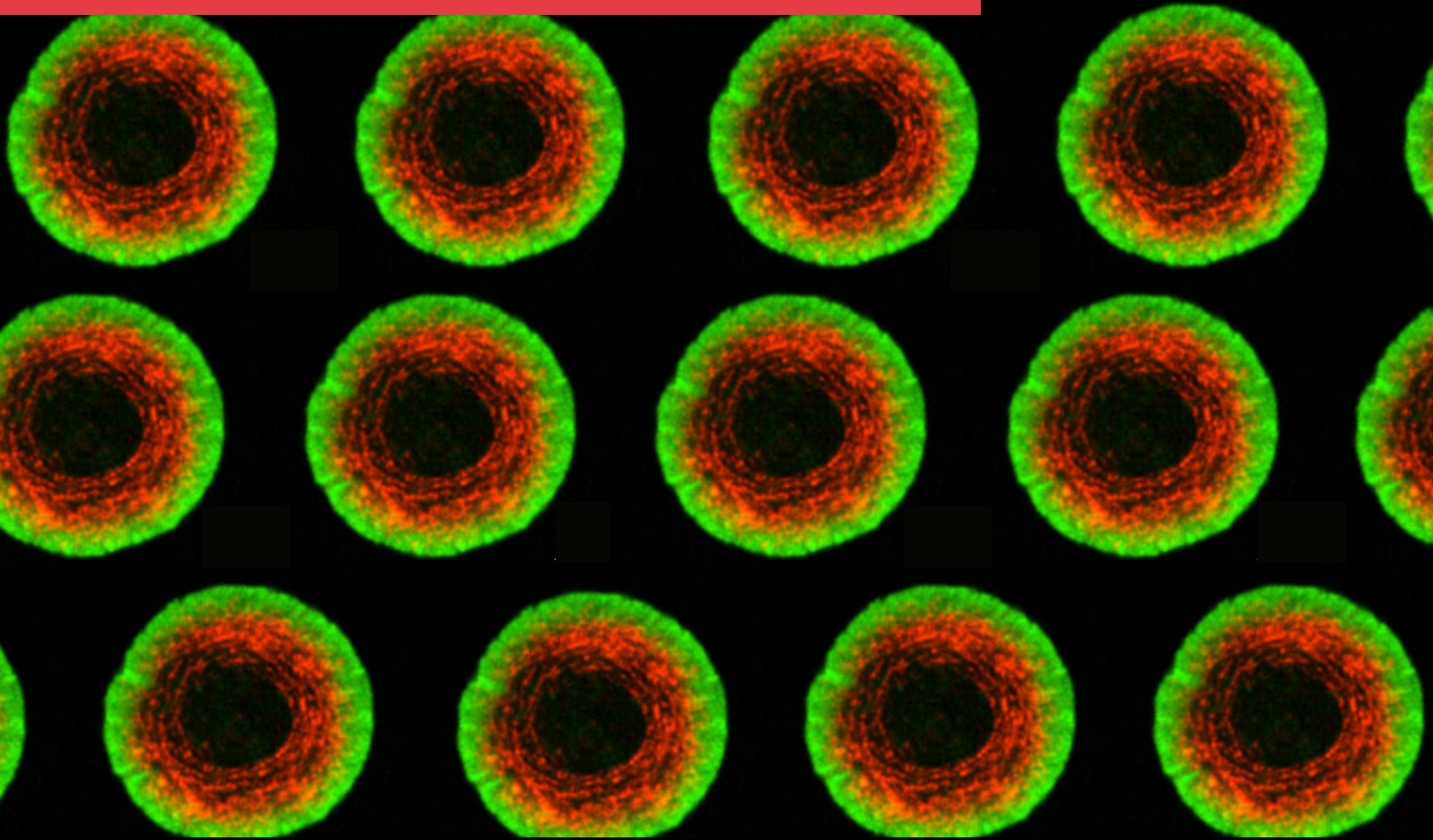


5TH ANNUAL MECHANOBIOLOGY SYMPOSIUM

MECHANOIMMUNOLOGY & EPIGENETICS

20
23



**HOSTED BY THE CENTER FOR ENGINEERING
MECHANOBIOLOGY**

**APRIL 4 & 5, 2023 • 9:00AM
SMILOW RUBENSTEIN AUDITORIUM
UNIVERSITY OF PENNSYLVANIA**

3400 Civic Center Blvd, Philadelphia, PA 19104

Zoom: <https://upenn.zoom.us/j/96323554507>

PROGRAM FLOW

2023 SYMPOSIUM

APRIL 4 - DAY 1

8:40-9:00 AM

Check-In

9:00-9:05 AM

Opening Remarks

Vivek Shenoy, Director, CEMB

SESSION 1

9:05-9:35 AM

Morphodynamic cell and tissue plasticity in the early embryo

Verena Ruprecht, PhD (Centre for Genomic Regulation)

9:35-9:50 AM

How does the microenvironment affect the chromatin arrangement: A polymer perspective

Vinayak (University of Pennsylvania)

9:50-10:05 AM

Trainee presentation

10:05-10:35 AM

Compromised nuclear envelope integrity leads to tumor cell invasion

Guilherme Nader (Children's Hospital of Philadelphia)

10:35-11:00 AM

Break

SESSION 2

11:00-11:30 AM

Epigenetic state during and after confined migration

Andrew Holle (Mechanobiology Institute, NUS)

11:30AM-12:00 PM

Mechano-epigenetic engineering for cell reprogramming

Song Li (University of California, Los Angeles)

12:00-12:15 PM

Postdoc Preview Day Presentation Winners

12:15-1:30 PM

Lunch

Wifi: AirPennNet-Guest

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PROGRAM FLOW

2023 SYMPOSIUM

APRIL 4 - DAY 1

SESSION 3

- 1:30-2:00 PM** **Parsing mechanosensing through $\alpha\beta$, $\gamma\delta$ and CAR T-Cell receptor constructs**
Matt Lang (Vanderbilt University)
- 2:00-2:15 PM** **T cells use integrin-dependent adhesion to migrate in complex environments**
Alexia Caillier (Loyola University Chicago)
- 2:15-2:45 PM** **Molecular Mechanisms Underlying Stomatal Immunity**
Maeli Melotto (University of California, Davis)
- 2:45-3:00 PM** **Break**
- 3:00-3:30 PM** **Mechanobiological control of T-cell activation**
Marco Fritzsche (Rosalind Franklin Institute, Kennedy Institute for Rheumatology, University of Oxford)
- 3:30-3:45 PM** **Micro-phase separation and viscoelasticity mediate meniscus cell migration in hyaluronic acid hydrogels**
Karen Xu (University of Pennsylvania)
- 3:45-4:00 PM** **Break**
- 4:00-5:30 PM** **Poster Session and Reception**

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PROGRAM FLOW

2023 SYMPOSIUM

APRIL 5 - DAY 2

8:40-9:00 AM

Coffee

9:00-9:05 AM

Opening Remarks

Vivek Shenoy, Director, CEMB

SESSION 4

9:05-9:35 AM

Nuclear mechanotransduction & stem cell fate regulation

Yekaterina Miroshnikova (NIH)

9:35-9:50 AM

Cytoskeletal regulation of differential T cell chemotactic responses

Franklin Staback Rodríguez (University of Pennsylvania/Children's Hospital of Philadelphia)

9:50-10:20 AM

Molecular Dynamics of Chromatin Underpinning Cell Fate Conversions

Ken Zaret (University of Pennsylvania)

10:20-10:50 AM

T cell sensing of mechanotopography

Lance Kam (Columbia University)

10:50-11:10 AM

Break

SESSION 5

11:10-11:40 AM

Mechano-signaling triggered immunity contributes to plant defense against necrotrophic fungi

Adelin Barbacci (French National Centre for Scientific Research, National Institute for Agriculture, Food, & Environment)

11:40AM-11:55 AM

Matrix Viscoelasticity Regulates T Cell Phenotype

Kwasi Adu-Berchie, (Wyss Institute, Harvard University)

11:55 AM-12:25 PM

Forces in T cell activation

Claire Hivroz (Institut Curie)

12:30 PM

Closing Remarks and Lunch

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POSTER PRESENTATIONS

2023 SYMPOSIUM

1. *Matrix Viscoelasticity Regulates T Cell Phenotype*

Kwasi Adu-Berchie, Wyss Institute for Biologically Inspired Engineering, Harvard University

2. *Spaceflight mechanobiology: MRTF-A (MKL1) may be the missing central link between microgravity and macrophage dysfunction*

Rocky An, Cornell University

3. *Engagement of adhesion receptors enhances T cell activation in a stiffness-dependent manner*

Niroshan Anandasivam, University of California, Berkeley

4. *Role of mesodermal fibronectin in mechanotransduction during cardiac development*

Cecilia Arriagada, Rutgers University

5. *T cells use integrin-dependent adhesion to migrate in complex environments.*

Alexia Caillier, Loyola University Chicago

6. *Studying the role of tumor mechanics on immune cell infiltration using a 3D microfluidic platform*

Brian Cheung, Cornell University

7. *Collagen Nanoyarns: Porosity-tunable Hierarchical 3D Biomaterial Constructs*

Emeka Chikelu, Drexel University

8. *Leveraging in vitro model systems to assess uterine mechanobiology during pregnancy*

Isabella Claire, Boston University

9. *Nanoscale viscoelastic surface characterization of T lymphocytes during formation of the immune synapse*

Kun Do, National Institutes of Health

10. *Active Chromatin Dynamics Drives Nuclear Bulge Formation*

Sarthak Gupta, Syracuse University

11. *Microenvironmental mechanoactivation through Yap/Taz suppresses chondrogenic gene expression*

Grey Hallstrom, University of Pennsylvania

12. *Optimisation and investigation of muscle-specific bioactivity of synthetic hydrogels*

Veronica Hidalgo-Alvarez, University College London

13. *Deciphering the chromatin mechanoresponse in glioblastoma treatment*

Chieh-Ren (Jeremiah) Hsia, National Institutes of Health

14. *Small, fat-filled lipid droplets are sufficiently rigid to indent a nucleus, dilute the lamina, and cause rupture*

Irena Ivanovska, University of Pennsylvania

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POSTER PRESENTATIONS

2023 SYMPOSIUM

15. *Activation of Myocardin-Related Transcriptional Factors A/B (MRTF-A/B) proteins by stiffness in hepatocytes*
Alejandra Jimenez Escobar, National Autonomous University of Mexico
16. *Structural mechanobiology of megakaryocyte-driven contraction of fibrin clots*
Oleg Kim, Virginia Tech/University of Pennsylvania
17. *Mechano-chemical analyses of Arabidopsis cell walls at nanoscale*
Huiyong Li, Washington University in St. Louis
18. *YAP and TAZ mediate mechanoregulation of embryonic bone formation and bone growth*
Yasaman Moharrer, University of Pennsylvania
19. *Imaging the Molecular Kinetics of Functional Nuclear Organization During Development*
Apratim Mukherjee, Children's Hospital of Philadelphia
20. *Polyacrylamide hydrogels for large-batch cell culture and real-time tunable stiffness*
Xuechen Shi, University of Pennsylvania
21. *Cytoskeletal regulation of differential T cell chemotactic responses*
Franklin Staback Rodriguez, University of Pennsylvania/Children's Hospital of Philadelphia
22. *Mechano-bio-energetics of adherent cells regulates cell metabolism, contractility and morphology in 2D and 3D microenvironments*
Joshua Toth, University of Pennsylvania
23. *Nutrient Transport for Increasing the Active Lifespan of Engineered Living Materials*
Ellen van Wijngaarden, Cornell University
24. *How does the microenvironment affect the chromatin arrangement: A polymer perspective*
Vinayak, University of Pennsylvania
25. *Micro-phase separation and viscoelasticity mediate meniscus cell migration in hyaluronic acid hydrogels*
Karen Xu, University of Pennsylvania
26. *Mechanical Checkpoint Regulates Monocyte Differentiation in Fibrotic Niche*
Shuchen Zhang, University of Pennsylvania

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