



iPoLS Annual Meeting 2018

Friday, June 22

Main Auditorium, Rice University BioScience Research Collaborative (BRC), 6500 Main St,

3:00-6:00 Introductory Remarks – Dr. Herbie Levine, Rice University

Talks – Session 1: DNA

3:10-3:55 Dr. Simon Mochrie – Introduction

4:00-4:15 Radoslav Aleksandrov – Coordinated repair of complex DNA lesions

4:20-4:35 Margaret Bullock – NF- κ B-chromatin interactions drive diverse phenotypes by modulating transcriptional bursting

4:40-4:55 Dmitriy Bobrounikov – Genome-wide single-molecule positioning of nucleosomes within entire genes

5:00-5:20 Dr. Michele Di Perro – The three-dimensional architecture of the human genome: it's nuclear physics!

5:25-5:40 Sumit Sinha – Collective phenomena of cells in evolving tumors

5:45-6:00 Melia Bonomo – Modularity and hierarchy in CRISPR-Cas target recognition

Saturday, June 23 Main Auditorium, Rice BRC

8:25-12:00 Welcome Remarks - Dr. Krastan Balgovev, NSF

Talks – Session 2: Mechanics

8:30-9:15 Dr. Arpita Upadhyaya – Introduction

9:20-9:40 Dr. Mauro Mugnai – Modeling the walking of Myosin VI Motor

9:45-10:00 Aravind Chandrasekaran – Intricate mechano-chemical interplay among actin filament treadmilling and the activities of Myosin

10:00-10:15 Coffee break

10:15-10:35 Dr. Antonin Fruleux – Variable tissue growth and mechanical response

10:40-10:55 Jordan Shivers – Mechanics of fibrous networks with embedded inclusions

11:00-11:15 Yanjun Yang – Role of the supracellular actomyosin cable during epithelial wound healing

11:20-11:35 Abby Bull – Physical control of Actin dynamics in immune cells

11:40-11:55 Jessica Faubel – Tailorable, regenerating hyaluronan brushes: A novel class of biointerfaces generated by hyaluronan

12:00-1:00 Lunch BRC Event Space

12:45-2:45 Poster Session 1: Odd numbered posters

BRC Event Space

2:40-3:00 Coffee break

3:00-6:15 Talks – Session 3: Molecules

3:00-3:45 Dr. Dave Thirumalai – Introduction

3:50-4:10 Dr. Xingchen Lin – PAGE4 and conformational switching: Insights from molecular dynamics simulations and implications for prostate cancer

4:15-4:30 Clark Templeton – The impact of magnesium concentration on the tertiary structure of an RNA model

4:35-4:50 Mark Hortal – Forcing the reversibility of a mechanochemical reaction

4:55-5:10 Yihang Wang – Predictive information bottleneck for sampling and driving rare events in biophysics

5:15-5:30 Thomas Rademaker – A mathematical relationship between ligand antagonism and adversarial examples

5:35-5:50 Dongheon Lee – Kinetic Monte Carlo modeling of multivalent binding of CTB proteins with GM1 receptors

5:55-6:10 Weilu Shen – Light-activated substrates for intracellular delivery

6:40-6:45 Board buses at BRC for dinner at St. Arnold's Brewery

7:00-9:30 Dinner at St. Arnold's Brewery

Sunday, June 24 Main Auditorium, Rice BRC

8:30-12:15 Talks – Session 4: Organisms

8:30-9:15 Dr. Josh Shaevitz – Introduction

9:20-9:50 Dr. Minsu Kim – Stochastic nature of bacterial eradication using antibiotics

9:55-10:10 Ashish George – Chirality provides a direct fitness advantage and facilitates intermixing in cellular aggregates

10:15-10:30 Coffee

10:30-10:45 Cassidy Yang – Exploring the 3D mechanics of *Myxococcus xanthus* aggregation

10:50-11:10 Dr. Yasemin Aydin – Design of a soft earthworm robot

11:15-11:30 Jeff Gau – Springs and wings: energetic consequences of deformable structures in insect flight

11:35-11:50 Bahnisikha Dutta – Prey and mound disassembly, manipulation and transport by fire ant swarms

11:55-12:10 Olga Shishkov – Competition of feeding fly larvae causes active mixing

Monday, June 25 Main Auditorium, Rice BRC

8:30-12:15 Talks – Session 5: Systems

8:30-9:15 Dr. Mohit Kumar Jolly - Introduction

9:20-9:50 Dr. Qiong Yang – From molecules to development: revealing mechanisms and functions of biological clocks

- 9:55-10:10 Tyler Smith – Increased dimensionality of cell-cell communication can decrease the precision of gradient sensing
- 10:15-10:30 Dongya Jia – Systems biology analysis of cancer metabolism
- 10:30-10:45 Coffee break**
- 10:45-11:05 Dr. Rati Sharma – Stress response dynamics that span different signaling pathways
- 11:10-11:25 Roshni Bano – Studying fluctuations in the chemotactic signaling network in *E. coli*
- 11:30-11:45 Shubham Tripathi – A mechanism for epithelial-mesenchymal plasticity in populations of cancer cells
- 11:50-12:05 Sarthak Chandra – Locally tree-like approximations for avalanches on networks: Limitations and extensions

12:05-1:15 Lunch and Workshops

Event Space for lunches, Alternative Career Panel in Auditorium, Science iPoLS Business meeting for PoLS Faculty, Event Space

1:20-3:10 Poster Session 2: Even numbered posters BRC Event Space

2:50-3:10 Coffee break

3:10-6:30 Talks – Session 6: Information Processing

3:10-3:55 Dr. Ilya Nemenman – Introduction

4:00-4:15 Thomas Dupic – Genesis of alpha-beta T-cell receptor through high-throughput pairing

4:20-4:35 Jason George – Stochastic modeling of tumor progression and immune evasion

4:40-4:55 Jacob Baron – Invariances in a combinatorial olfactory receptor code

5:00-5:15 Coffee break

5:15-5:30 Xiaowen Chen – Searching for collective behavior in a small brain

5:35-5:50 Zachary Jackson – Dynamics of Tinnitus and coordinated reset therapy

5:55-6:10 Chaoyi Jin – Diffusion dynamics of AMPAR receptors under basal and LTP conditions

6:15-6:30 Baohua Zhou – Chance, long tails, and inference: a non-Gaussian, Bayesian theory of vocal learning in songbirds

Tuesday, June 26 Main Auditorium, Rice BRC

8:30-11:00 Talks – Session 7: New directions in Biophysics

8:30-9:00 Dr. Zan Luthey-Schulten – Synthetic cells

9:10-9:40 Dr. Erez Aiden – DNA Structure

9:50-10:20 Dr. Jeff Mouldrem – Immunology and Cancer

10:30-11:00 Dr. Kirsten Siebach – Mars Rover Mission

Friday
22-Jun

Saturday
23-Jun

Sunday
24-Jun

Monday
25-Jun

Tuesday
26-Jun

Session 2a
Mechanics 1
8:30-10:00

Session 4a
Organisms
8:30-10:30

Session 5
Information
Processing 1
8:30-10:30

Session 7
New Directions
in Biophysics
8:30-11:00

Coffee

Coffee

Coffee

Session 2b
Mechanics 2
10:15-12:00

Session 4b
Organisms 2
10:45-12:15

Session 5b
Info Processing 2
10:45-12:05

Lunch
12:00-1:00

Free Time

Lunch &
Workshops

Coffee

Poster Session 1
12:45-2:45
Odd numbers

Poster Session 2
Even numbers
1:20-3:10

Session 1
DNA/RNA
3:00-6:00

Coffee

Coffee

Session 3
Molecular
3:00-6:15

Session 6a
Systems 1
3:10-5:00

Buses to dinner 6:40
Dinner at
St. Arnold's Brewery
7:00-9:30

Coffee

Session 6b
Systems 2
5:15-6:30