Winter QBio Conference 2024

Event Schedule

Mon, Feb 19, 2024

5:00 PM

Opening Registration and Welcome Reception
5:00 PM - 8:00 PM, Feb 19

6:00 PM

Kids' Science! Foldscopes and "Magic" Refraction of Light
6:00 PM - 8:00 PM, Feb 19

Tue, Feb 20, 2024

7:00 AM

Registration and Breakfast
7:00 AM - 8:40 AM, Feb 20

9:00 AM

Opening Remarks and Morning Session I
9:00 AM - 10:40 AM, Feb 20

Moderator: Galit Lahav

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4 Subsessions

- **Opening Remarks (Hana El-Samad & Galit Lahav)**
  9:00 AM - 9:20 AM, Feb 20
- **Akiko Iwasaki (Keynote)**
  9:20 AM - 9:55 AM, Feb 20
- **Michaela Hinks: Direct measurement of promoter and enhancer molecular configurations enable mechanistic models of human gene expression in human cells**
  10:00 AM - 10:15 AM, Feb 20
- **Hirohide Saito: Synthetic RNA and RNP technologies to program gene expression and cell fate**
  10:20 AM - 10:35 AM, Feb 20

10:40 AM

Coffee Break
10:40 AM - 11:00 AM, Feb 20

Kids' Science! Density Fireworks, Lava Lamps, and DNA Models
10:40 AM - 12:00 PM, Feb 20

11:00 AM

Morning Session II
11:00 AM - 12:20 PM, Feb 20

Moderator: Galit Lahav

3 Subsessions

● **Marylyn Ritchie (Keynote)**
11:00 AM - 11:35 AM, Feb 20
● **Ting Lu: De novo engineering of a bacterial lifestyle program**
11:40 AM - 11:55 AM, Feb 20
● **Xiaojing Yang: Achieving Stable Labor Division with Innovative Gene Circuitry**
12:00 PM - 12:15 PM, Feb 20

12:20 PM

Lunch (on own)
12:20 PM - 1:40 PM, Feb 20

1:40 PM

Afternoon Session I
1:40 PM - 3:00 PM, Feb 20

Moderator: Hana El-Samad

3 Subsessions

● **Lea Goentoro (Keynote)**
1:40 PM - 2:15 PM, Feb 20
● **Adam Feist: Biocomposite Thermoplastic Polyurethanes Containing Evolved Bacterial Spores as Living Fillers to Facilitate Polymer Disintegration**
2:20 PM - 2:35 PM, Feb 20
● **Jia Lu: Emergent pattern formation by porting gene circuits to new hosts**
2:40 PM - 2:55 PM, Feb 20

3:00 PM

Coffee Break
3:00 PM - 3:20 PM, Feb 20

3:20 PM

Afternoon Session II
3:20 PM - 4:40 PM, Feb 20

Moderator: Hana El-Samad

3 Subsessions

● **Alan Rodrigues & Amy Shyer (Keynote)**
3:20 PM - 3:55 PM, Feb 20
● **Ertugrul Ozbudak: Reengineering somite segmentation without the vertebrate segmentation clock**
3:40 PM - 4:15 PM, Feb 20
● **Sam Wolff: Cell Cycle Plasticity Underlies Fractional Resistance to Palbociclib in ER+/HER2- Breast Tumor Cells**
4:20 PM - 4:35 PM, Feb 20

6:30 PM

w-qBio Community Building Event
6:30 PM - 8:30 PM, Feb 20

Kid's Movie Night
6:30 PM - 8:30 PM, Feb 20

Wed, Feb 21, 2024

7:00 AM

Breakfast
7:00 AM - 8:30 AM, Feb 21

8:40 AM

Contributed Session I
8:40 AM - 10:40 AM, Feb 21

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8 Subsessions

- **Silvia Canas-Duarte: Glycogen phase separation drives macromolecular rearrangement and asymmetric division upon nutrient depletion in Escherichia coli**
  8:40 AM - 8:50 AM, Feb 21
- **Jialong Jiang: Revealing regulatory network organization through single-cell perturbation profiling and maximum entropy models**
  8:50 AM - 9:00 AM, Feb 21
- **Jintao Liu: Spatial coordination of metabolism in bacterial communities**
  9:00 AM - 9:10 AM, Feb 21
- **Wayne Stallaert: Visualizing cell cycle plasticity using highly-multiplexed single-cell imaging**
  9:10 AM - 9:20 AM, Feb 21
- **Alexandros Papagiannakis: Dynamic and functional heterogeneity inside the bacterial cytoplasm**
  9:30 AM - 9:40 AM, Feb 21
- **Jamiree Harrison: Design of a Phase Dependent Hybrid Promoter Library in E. Coli**
  9:40 AM - 9:50 AM, Feb 21
- **Shiyu Xia: Synthetic control of cell death**
  9:50 AM - 10:00 AM, Feb 21
- **Nik Kovinich: Manipulating JAZ1 Expression Identifies a Derepression Mechanism that Partially Unlocks Phytoalexin Biosynthesis**
  10:00 AM - 10:10 AM, Feb 21

Contributed Session II
8:40 AM - 10:40 AM, Feb 21

8 Subsessions

- **Yodai Takei: Deciphering Single-Cell Nuclear Architecture in Complex Tissues with High-Resolution Spatial Multi-Omics**
  8:40 AM - 8:50 AM, Feb 21
- **Nathan Belliveau: Electrifying Secrets of Directed Cell Migration**
  8:50 AM - 9:00 AM, Feb 21
- **Jae Kyoung Kim: First robust ultrasensitive transcriptional switch in noisy cellular environments**
  9:00 AM - 9:10 AM, Feb 21
- **Abby Thurm: High-Throughput Discovery of Regulatory Domains in RNA Binding Proteins**
  9:10 AM - 9:20 AM, Feb 21
- **Veena Venkatachalam: Intercellular heterogeneity in the radioadaptive response: Low-dose radiation induces p53 and p21, altering how cells respond to subsequent therapy**
  9:30 AM - 9:40 AM, Feb 21
- **Kotaro Fujimaki: From DNA damage to nuclear deformation, and everything in between**
  9:40 AM - 9:50 AM, Feb 21
- **Siting Gan: Distinct tumor architectures and microenvironments for the initiation of metastasis in the brain**
  9:50 AM - 10:00 AM, Feb 21
- **Anjali Nelliat: Aim29 is a novel co-chaperone that mediates folding of eukaryotic translation elongation factor 1A via a GTPase cycle**
  10:00 AM - 10:10 AM, Feb 21

10:10 AM

Coffee Break
10:10 AM - 10:30 AM, Feb 21

10:20 AM

Kids' Science! Chemical Reaction Sherbet and Energy Exchange
10:20 AM - 12:00 PM, Feb 21

10:30 AM

Main Morning Session
10:30 AM - 12:20 PM, Feb 21

Moderator: Jeff Hasty

4 Subsessions

- **Opening Remarks/Announcements**
  10:30 AM - 10:40 AM, Feb 21
- **Ilka Bischofs (Keynote)**
  10:40 AM - 11:15 AM, Feb 21
- **Yonatan Chemla: Prediction, Molecular Discovery, And Testing of Hyperspectral Reporters for Quantitative Remote Sensing of Gene Expression**
  11:20 AM - 11:35 AM, Feb 21
- **Sabrina Spencer (Keynote)**
  11:40 AM - 12:15 PM, Feb 21

12:20 PM

Lunch (on own)
12:20 PM - 1:40 PM, Feb 21

1:40 PM

Afternoon Session
1:40 PM - 3:40 PM, Feb 21

Moderator: Olga Troyanskaya

4 Subsessions

● Tammy Collins (Keynote)
1:40 PM - 2:15 PM, Feb 21

● Sheng Wang: Synthetic Circuits for Multicellular Reaction-Diffusion Patterning
2:20 PM - 2:35 PM, Feb 21

● Mona Singh (Keynote)
2:40 PM - 3:15 PM, Feb 21

● Paul Piho: Feedback between stochastic gene networks and population dynamics enables cellular decision making
3:20 PM - 3:35 PM, Feb 21

3:40 PM

Coffee Break
3:40 PM - 4:00 PM, Feb 21

4:00 PM

Poster Session
4:00 PM - 5:30 PM, Feb 21

7:30 PM

Pa'ina Haumana
7:30 PM - 9:00 PM, Feb 21

Get together for graduate students and post docs!

Thu, Feb 22, 2024

7:00 AM

Breakfast
7:00 AM - 8:40 AM, Feb 22

8:40 AM

Contributed Session I
8:40 AM - 10:40 AM, Feb 22

9 Subsessions

● **Chaitra Agrahar: Analyzing Time-course 'Omics Data with Pathspace Kalman Filters**
8:40 AM - 8:50 AM, Feb 22

● **Orr Levy: Gene regulatory interactions limit the diversity of gene expression**
8:50 AM - 9:00 AM, Feb 22

● **Flemming Holtorf: Learning the Parameters of Stochastic Reaction Networks**
9:00 AM - 9:10 AM, Feb 22

● **Jacob Parres-Gold: Principles of Computation by Competitive Protein Dimerization Networks**
9:10 AM - 9:20 AM, Feb 22

● **Cordelia McGehee: Minimizing Drug Toxicity in Analytical Models of Adaptive Chemotherapy Dosing in Cancer Demonstrates Superiority of Continuous Dosing Schemes**
9:30 AM - 9:40 AM, Feb 22

● **Tarek Zikry: Hypothesis testing for manifold approximations to interpret the cell cycle**
9:40 AM - 9:50 AM, Feb 22

● **Harold McNamara: Recording morphogen signals reveals origins of gastruloid symmetry breaking**
9:50 AM - 10:00 AM, Feb 22

● **Gavin Schlissel: Topological barriers shape morphogen diffusion**
10:00 AM - 10:10 AM, Feb 22

● **Tiffany Zhou: Engineering Synchronized Lysis of Bacterial Populations in Biofilms**
10:10 AM - 10:20 AM, Feb 22

Contributed Session II
8:40 AM - 10:40 AM, Feb 22

8 Subsessions

● **Shichen Liu: Force Propagation in Active Cytoskeletal Networks**
8:40 AM - 8:50 AM, Feb 22

● **Nicholaus DeCuzzi: RAMPKAR: A Novel Red-FRET Fluorescent Biosensor for Real-Time Monitoring of AMPK and FBP Oscillations in Live Cells**
8:50 AM - 9:00 AM, Feb 22

● **Itsuki Abe: Protein splicing enables the high target-cell specificity of a synthetic circuit composed of multiple RNA switches**
9:00 AM - 9:10 AM, Feb 22

● **Jeff Nivala: Multi-pass, single-molecule nanopore reading of long protein strands with single-amino acid sensitivity**
9:10 AM - 9:20 AM, Feb 22

● **Diep Nguyen: Spatial gradients of viral sensing confer a tiered tissue defense system**
9:30 AM - 9:40 AM, Feb 22

● **Benjamin Doughty: Quantitative models of transcription factor occupancy and gene expression from millions of single-molecule measurements**
9:40 AM - 9:50 AM, Feb 22

● **Wojciech Szpankowski: Finding Signals in Biological Sequences via Mutual Information**
9:50 AM - 10:00 AM, Feb 22

● **Julia Schaepe: Direct measurement of promoter and enhancer molecular configurations reveal molecular mechanisms for rapid gene activation in interferon stress response**
10:00 AM - 10:10 AM, Feb 22

10:10 AM

Coffee Break
10:10 AM - 10:30 AM, Feb 22

10:20 AM

Kids' Science! Rubber Band Helicopters and Skittles Diffusion
10:20 AM - 12:00 PM, Feb 22

10:30 AM

Main Morning Session
10:30 AM - 12:20 PM, Feb 22

Moderator: Lev Tsimring

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5 Subsessions

- **Opening Remarks/Announcements**
  10:30 AM - 10:40 AM, Feb 22
- **Nathan Lord: Mechanisms of robust pattern formation in zebrafish embryogenesis**
  10:40 AM - 10:55 AM, Feb 22
- **Lacra Bintu (Keynote)**
  11:00 AM - 11:35 AM, Feb 22
- **Robert Cooper: Bacterial biosensors detect tumor DNA**
  11:40 AM - 11:55 AM, Feb 22
- **Zev Gartner: Configurational entropy is an intrinsic driver of tissue structural heterogeneity**
  12:00 PM - 12:15 PM, Feb 22

12:20 PM

Lunch (on own)
12:20 PM - 1:40 PM, Feb 22

1:40 PM

Afternoon Session I
1:40 PM - 3:00 PM, Feb 22

Moderator: Wendell Lim

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3 Subsessions

- **Karmella Haynes (Keynote)**
  1:40 PM - 2:15 PM, Feb 22
- **Cecelia Andrews: Dynamics and Mechanisms of Pulse-Generating Transcriptional Effector Domains**
  2:20 PM - 2:35 PM, Feb 22
- **Shou-Wen Wang: A mouse model with high clonal barcode diversity for joint lineage, transcriptomic, and epigenomic profiling in single cells**
  2:40 PM - 2:55 PM, Feb 22

3:00 PM

Coffee Break
3:00 PM - 3:20 PM, Feb 22

Afternoon Session II
3:00 PM - 4:40 PM, Feb 22

Moderator: Wendell Lim

3 Subsessions

● **Johan Paulsson (Keynote)**
3:20 PM - 3:55 PM, Feb 22

● **Rongrong Du: Dosage compensation modules for precise mammalian gene expression**
4:00 PM - 4:15 PM, Feb 22

● **Sungrim Seirin-Lee: Mind the gap: The extra-embryonic space is crucial geometric constraint regulating cell arrangement**
4:20 PM - 4:35 PM, Feb 22

6:30 PM

Banquet!
6:30 PM - 9:30 PM, Feb 22

Fri, Feb 23, 2024

7:00 AM

Breakfast
7:00 AM - 8:40 AM, Feb 23

8:40 AM

Contributed Session I
8:40 AM - 10:40 AM, Feb 23

9 Subsessions

● **Kang Xia: Cysteine metabolism and immune evasion in colorectal cancer**
8:40 AM - 8:50 AM, Feb 23

● **Annie Trinh: Characterizing nascent strand DNA methylation within long-read sequencing data**
8:50 AM - 9:00 AM, Feb 23

● **Jellert Gaublomme: Multi-omic Optical Pooled Screening in Human Cells and Tissue**
9:00 AM - 9:10 AM, Feb 23

● **Inayat Ullah Irshad: Decoding stoichiometric protein synthesis in E. Coli**
9:10 AM - 9:20 AM, Feb 23

● **Benjamin Doran: Discovery and characterization of subspecies phylogeny in the human gut microbiome using deep eigenmodes**
9:30 AM - 9:40 AM, Feb 23

● **Minakshi Ashok: Measuring Energetics of Motor-Microtubule Systems**
9:40 AM - 9:50 AM, Feb 23

● **Emil Marklund: In vitro and in vivo effects of clustered sites and sequence context in transcription factor - DNA binding**
9:50 AM - 10:00 AM, Feb 23

● **Sean Hackett: The Molecular Architecture of Variable Lifespan in Diversity Outbred Mice**
10:00 AM - 10:10 AM, Feb 23

● **Joanna Zhang: Host evolution improves genetic circuit function in complex growth environments**
10:10 AM - 10:20 AM, Feb 23

Contributed Session II
8:40 AM - 10:40 AM, Feb 23

9 Subsessions

- **Rosalind Pan: Dissecting endogeneous genetic circuits from first principles**
  8:40 AM - 8:40 AM, Feb 23
- **Cyrus Knudsen: Consistent, scalable and globally optimal estimation of kinetic and regulatory parameters in biochemical reaction networks using convex optimization**
  8:50 AM - 9:00 AM, Feb 23
- **Qing Sun: RNAdegformer: Accurate Prediction of mRNA Degradation at Nucleotide Resolution with Deep Learning**
  9:00 AM - 9:10 AM, Feb 23
- **Robyn Shuttleworth: Mathematical Modeling of the Blood-Brain Barrier**
  9:10 AM - 9:20 AM, Feb 23
- **Luis Pedro Garcia-Pintos: Evolutionary rate limits on biological traits**
  9:30 AM - 9:40 AM, Feb 23
- **Pranav Bhamidipati: Designing biochemical circuits with tree search**
  9:40 AM - 9:50 AM, Feb 23
- **Cesar Nieto: Unveiling Cell Division Contributors by Integration of Cell Size Control into the Stochastic Dynamics of Microbial Colony Expansion**
  9:50 AM - 10:00 AM, Feb 23
- **Tongli Zhang: Facilitating the organization and analysis of real-world data with 'digital babies'**
  10:00 AM - 10:10 AM, Feb 23
- **Amanda Wacker: Continuous single-molecule tracking using self-healing fluorescent DNA origami rotors**
  10:10 AM - 10:20 AM, Feb 23

10:20 AM

Coffee Break
10:20 AM - 10:40 AM, Feb 23

10:30 AM

Kids' Science! Owl Pellets and Lego DNA Pairing
10:30 AM - 12:00 PM, Feb 23

10:40 AM

Main Session and Closing Remarks
10:40 AM - 12:00 PM, Feb 23

Moderator: Gürol Süel

3 Subsessions

- **Arianna Miano: High-resolution temporal profiling of E. coli transcriptional response**
  10:40 AM - 10:55 AM, Feb 23
- **Allison Williams (Keynote)**
  11:00 AM - 11:35 AM, Feb 23
- **Closing Remarks**
  11:40 AM - 11:55 AM, Feb 23

12:00 PM

Meeting Adjourns
12:00 PM - 12:00 PM, Feb 23