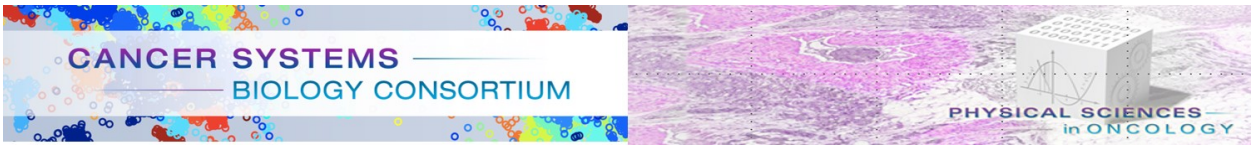
#CSBCPSON2018



Cancer Systems Biology Consortium (CSBC) & Physical Sciences-Oncology Network (PS-ON) Annual Investigators Meeting

September 25-28, 2018, Natcher Conference Center**,** NIH Campus, Bethesda, MD

Tuesday, September 25, 2018

*9:30–11:00 am	*CSBC/PS-ON Education and Outreach & Patient Advocacy Working Groups*	*Room G1/G2*
12:00 – 1:00 pm	**Check-in**	*Lobby*
1:00 – 1:30 pm	**Welcoming Remarks and Meeting Overview** **Dan Gallahan, PhD,** *Deputy Director, Division of Cancer Biology, NCI*	*Auditorium*
1:30 – 2:50 pm	**Session I: Lightning Talks: Overviews of U54 Centers** *Chair:* **Nastaran Zahir, PhD***, Associate Director, Division of Cancer Biology, NCI*	
2:50 – 3:00 pm	**Mathematical Oncology bioRχiv Collection** **Alexander (Sandy) Anderson, PhD,** *Chair, Integrated Mathematical Oncology, H. Lee Moffitt Cancer Center* **Jennifer Couch, PhD,** *Chief, Structural Biology and Molecular Applications Branch, Division of Cancer Biology, NCI*	
3:00 – 5:00 pm	**Poster Session**	*Atrium*

Wednesday, September 26, 2018

8:00 – 9:00 am	**Check-in**	*Lobby*
9:00 – 9:20 am	**Opening Remarks by the NCI Director** **Ned Sharpless, MD,** *Director, NCI* ***With introduction by Dinah Singer, PhD,*** *Deputy Director (Acting), NCI; Director, Division of Cancer Biology, NCI*	*Auditorium*
9:20 – 11:20 am	**Session 2: Cellular and Extracellular Interactions** *Chair:* **Andrea Bild, PhD,** *Professor, Medical Oncology and Therapeutics Research, City of Hope*	
	Scientific Presentations	
9:20	Monitoring dynamic heterogeneous responses to microenvironmental signals and therapeutic inhibitors **Laura Heiser, PhD,** *Associate Professor, Biomedical Engineering, Oregon Health & Science University*	
9:40	Engineered ECM platforms to analyze progression in high grade serous ovarian cancer **Pam Kreeger, PhD,** *Associate Professor, Biomedical Engineering, University of Wisconsin*	
10:00	Metabolic status and adaptability of breast cancer stem cells **Gary Luker, MD,** *Professor, Radiology and Biomedical Engineering, Molecular Biology and Immunology, University of Michigan*	
10:20	Fructose Fuels Metabolic and Epigenetic Reprogramming of Liver Metastasis **Xiling Shen, PhD**, *Hawkings Family Associate Professor, Biomedical Engineering, Duke University*	

Invited speaker

10:40 Real-Time In vivo Imaging of Immunotherapy
Mikael Pittet, PhD, *Associate Professor, Radiology, Harvard Medical School*

11:20 – 1:30 pm **Networking Break** *Room E1/E2*

11:30 – 12:30 **Scientific Working Group meetings**
Tumor Deconvolution Working Group *Room G1/G2*
Brain Tumor Working Group *Room 45A*

12:30 – 1:30 **Lunch – On Your Own**
Working Lunch: Resource & Data Sharing Working Group *Room G1/G2*

1:30 – 2:15 pm **U01 Lightning Talks** *Auditorium*
Chair: **Shannon Hughes, PhD**, *Program Director, Division of Cancer Biology, NCI*

2:15 – 4:15 pm **Session 3: Computational Modeling of Cancer for Precision Medicine**
Session Chair: **Justin Guinney, PhD**
Vice President, Computational Oncology, Sage Bionetworks

Scientific Presentations

2:15 Pan-cancer analysis of time-to-distant metastasis in the context of node-positive and node-negative disease
Andrew Gentles, PhD, *Assistant Professor, Biomedical Informatics Research, Stanford University*

2:35 Joining Forces: Combining Machine Learning and Mechanistic Models to Predict Tumor Cell Density for Glioblastoma Patients
Kristin Swanson, PhD, *Professor, Neurosurgery, Mayo Clinic*

2:55 Exploiting space and trade-offs in drug scheduling using adaptive therapy
Alexander (Sandy) Anderson, PhD, *Chair, Integrated Mathematical Oncology Department H. Lee Moffitt Cancer Center*

3:15 Modeling malignant myelopoiesis to increase efficacy of targeted leukemia therapy
John Lowengrub, PhD, *Chancellor's Professor, University of California, Irvine*

Invited Speaker

3:35 Using deep learning to model the hierarchical structure and function of cancer cells
Trey Ideker, PhD
Division Chief, Medical Genetics, Professor of Bioengineering and Medicine
University of California, San Diego

4:30 – 6:00 **Poster Session** *Atrium*

Thursday, September 27, 2018

9:00 – 11:00 am **Session 4: Genetic and Proteomic Interactions** *Auditorium*
Session Chair: **Trey Ideker, PhD**, *Division Chief, Medical Genetics, Professor of Bioengineering and Medicine, University of California, San Diego*

Scientific Presentations

9:00 Metabolome-wide features of therapeutic responses in head and neck cancer
Melissa Kemp, PhD, *Associate Professor, Biomedical Engineering, Georgia Institute of Technology*

9:20 A structure-based physical interactome for the human proteome: Biophysical mechanisms for cellular dysregulation and a complementary resource for high-throughput experimental PPI methods
Diana Murray, PhD, *Program Director, Systems Biology, Columbia University*

9:40 Systematic identification of the actionable kinase dependencies of chemotherapy-resistant triple-negative breast cancer
Jean-Philippe Coppé, PhD, *Research Scientist, University of California, San Francisco*

10:00 Systems approach for mapping functional cancer genome atlases in vivo
Sidi Chen, PhD, *Assistant Professor, Genetics and Systems Biology, Yale University*

Invited Speaker

10:20 Development of new CRISPR/Cas9-based tools to study drug interactions and mechanisms of cellular uptake
Michael Bassik, PhD
Assistant Professor, Genetics, Stanford University

11:00 – 1:30 pm **Networking Break** *Room E1/E2*

11:10 – 12:30 **Scientific Working Group Meetings**
Protein-Protein Interactions Working Group *Room G1/G2*
Single-Cell RNA Sequencing Working Group *Room 45A*

12:30 – 1:30 **Lunch – On Your Own**

1:30 – 2:15 pm **U01 Lightning Talks** *Auditorium*
Session Chair: **Nastaran Zahir, PhD,** *Associate Director, Division of Cancer Biology, NCI*

2:15 – 4:15 pm **Session 5: Non-coding Genome**
Session Chair: **Jonathan Licht, MD,** *Director, University of Florida Health Cancer Center*

Scientific Presentations

2:15 Micromechanics and structure of metaphase chromosomes and the cell nucleus
John Marko, PhD, *Professor, Molecular Biosciences, Physics and Astronomy, Northwestern University*

2:35 Nuclear rupture at sites of high curvature compromises retention of DNA repair factors
Dennis Discher, PhD, *Professor, Chemical and Biomolecular Engineering, Bioengineering, and Mechanical Engineering and Applied Mechanics, University of Pennsylvania*

2:55 Squish and squeeze - the role of the nucleus and lamins in breast cancer metastasis
Jan Lammerding, PhD, *Associate Professor, Biomedical Engineering, Cornell University*

3:15 Enhancer Reprogramming Promotes Breast Cancer Cell Lineage Plasticity to Achieve Endocrine Resistance
Jason Liu, PhD, *Assistant Professor, University of Texas Health Science Center - San Antonio*

Invited Speaker

3:35 The mechanisms underlying the impact of NSD2 overexpression on gene regulation in multiple myeloma
Jane Skok, PhD, *Sandra and Edward H. Meyer Professor, Pathology, New York University School of Medicine; Director, Cancer Genome Dynamics Program, Perlmutter Cancer Center*

4:15 – 4:45 pm **Break**

4:45 – 6:00 pm **Steering Committee Face-to-Face Meetings**
CSBC members only *Room G1/G2*
PS-ON members only *Room 45A*

Friday, September 28, 2018

9:00 – 11:30 am **Session 6: Translational Physical and Systems Biology** *Auditorium*
Session Chair: **David Odde, PhD,** *Professor, Biomedical Engineering, University of Minnesota*

9:00 **Patient Advocacy**
Carole Baas, PhD, *Patient Advocate, NCI PS-ON*

Scientific Presentations

9:30 Quantifying drug combination synergy along potency and efficacy axes
Vito Quaranta, MD, *Professor, Biochemistry & Pharmacology, Vanderbilt University*

9:50 A systems biology driven drug-repositioning strategy identifies digoxin as a potential treatment for Groups 3 and 4 medulloblastoma
Stephen T. Wong, PhD, *John S. Dunn, Sr. Presidential Distinguished Chair, Biomedical Engineering; Director, Precision Oncology, Houston Methodist Cancer Center; Professor, Radiology, Pathology, Laboratory Medicine, Neurology, and Neuroscience, Cornell University*

10:10 Linked single-cell biophysical and transcriptional profiles resolve heterogeneity in PDX models of B-cell acute lymphoblastic leukemia and suggest mechanisms of in vivo resistance
Scott Manalis, PhD, *Professor, Biological and Mechanical Engineering, Massachusetts Institute of Technology*

10:30 Synergistic interaction of physics and biology modulate biological barriers in the liver
Mauro Ferrari, PhD, *Ernest Cockrell Jr. Presidential Distinguished Chair, President and CEO, Houston Methodist Research Institute, Director, Inst. For Academic Medicine*

Invited Speaker

10:50 Biological Therapies for Brain Tumors
Fred Lang, MD. *Professor, Neurosurgery*, *University of Texas, MD Anderson Cancer Center*

11:30 – 12:45 **Working Group Updates** (10 min each)
- Education & Outreach and Patient Advocacy
- Resource & Data Sharing
- Brain Tumor
- Single-Cell RNA Sequencing
- Protein-Protein Interactions
- Tumor Deconvolution

12:45 – 1:00 pm **Closing Remarks by Dan Gallahan, PhD**, *Deputy Director, Division of Cancer Biology, NCI*

1:00 pm **Meeting Adjournment**