



Synthetic and Systems Approaches to Interrogate Spatiotemporal Processes in Cancer

Virtual Workshop Series

Workshop Series Agenda

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 - [May 15, 2025 | 12:00 -4:30 PM ET – Tumor-immune interactions](#)
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Spatiotemporal biology of transformation and cancer initiation

Date: May 13, 2025

Time: 12:00 PM – 4:30 PM ET

Location: Virtual & Online Collaboration Space

Meeting Co-Chairs: Zev Gartner (University of San Francisco) & Laura Heiser (Oregon Health & Science University)

AGENDA

12:00 PM – 12:15 PM | Welcome & Keynote Introduction

- Shannon Hughes, Deputy Director, Division of Cancer Biology, NCI
- Zev Gartner, University of San Francisco
- Laura Heiser, Oregon Health & Science University

12:15 PM – 12:55 PM | Keynote Presentation

Ken Lau, Vanderbilt University

Colorectal tumor initiation from human data to experimental models

12:55 PM – 1:05 PM | Keynote Q&A

1:05 PM – 1:20 PM | Break

Conversation 1

Moderator: Lukasz Bugaj, University of Pennsylvania

1:20 PM – 1:30 PM | Systems Biology

Arthur Lander, University of California, Irvine

Stochastic escape from proliferative control, and its relationship to tumorigenesis

1:30 PM – 1:40 PM | Synthetic Biology

Ahmad (Mo) Khalil, Boston University

Synthetic approaches to interrogate signaling and epigenetic alterations in cancer

1:40 PM – 2:00 PM | Group 1 Discussion

Conversation 2

Moderator: Edna (Eti) Cukierman, Fox Chase Cancer Center

2:00 PM – 2:10 PM | Systems Biology

Cassandra Burdziak, Memorial Sloan Kettering Cancer Center

The environment-plasticity axis in tumor initiation

2:10 PM – 2:20 PM | Synthetic Biology

Adam Stevens, University of Pennsylvania

Programming cell adhesion to interrogate tissue organization and tumor development

2:20 PM – 2:40 PM | Group 2 Discussion

2:40 PM – 3:00 PM | Break

Conversation 3

Moderator: Bianca Dumitrascu, Columbia

3:00 PM – 3:10 PM | Synthetic Biology

Carolyn Schutt Ibsen, Oregon Health & Science University

3D-programmable engineered tumor models enabled by ultrasound-responsive biomaterials

3:10 PM – 3:20 PM | Systems Biology

Joshua Snyder, Duke University

Illuminating Fould's rules of cancer progression in vivo: To progress or not progress, that is the question

3:20 PM – 3:35 PM | Group 3 Discussion

Collaborative Session

3:35 PM – 4:05 PM | Breakout Discussions

Participants will select a conversation for deeper discussion.

Conversation 1

Facilitators: Cheryl Cero (NCI) & Michelle Berny-Lang (NCI)

Conversation 2

Facilitators: Ron Johnson (NCI) & Vignesh Gunasekharan (NCI)

Conversation 3

Facilitators: Sharmistha Ghosh-Janjigian (NCI) & Hannah Dueck (NCI)

4:05 PM – 4:30 PM | Final Panel Discussion

Moderators and speakers reflect on key insights and next steps

Spatiotemporal biology of tumor-immune interactions

Date: May 15, 2025

Time: 12:00 PM – 4:30 PM ET

Location: Virtual & Online Collaboration Space

Meeting Co-Chairs: Lukasz Bugaj (University of Pennsylvania) & Ajit Nirmal (Harvard University)

AGENDA

12:00 PM – 12:15 PM | Welcome & Keynote Introduction

- Ann Geiger, Director, Center for Strategic Scientific Initiatives, NCI
- Lukasz Bugaj, University of Pennsylvania
- Ajit Nirmal, Harvard University

12:15 PM – 12:55 PM | Keynote Presentation

Thea Tlsty, University of California San Francisco

Insights Provided by Spatial Aspects of Tumor-Immune Interactions

12:55 PM – 1:05 PM | Keynote Q&A

Conversation 1

Moderator: Karin Pelka, Gladstone Institutes

1:05 PM – 1:15 PM | Systems Biology

Evanthia Roussos Torres, University of Southern California

Evaluation of spatiotemporal biology of tumor-immune interactions uncovers mechanisms of response to immune checkpoint inhibition in breast cancer

1:15 PM – 1:25 PM | Synthetic Biology

Rogelio Hernandez-Lopez, Stanford University

Engineered T cells for precise tumor recognition

1:25 PM – 1:45 PM | Group 1 Discussion

1:45 PM – 2:00 PM | Break

Conversation 2

Moderator: Elizabeth Wayne, University of Washington

2:00 PM – 2:10 PM | Systems Biology

Jose Reyes, Memorial Sloan Kettering Cancer Center

The making and breaking of a pre-cancer niche

2:10 PM – 2:20 PM | Synthetic Biology

Xiaojing Gao, Stanford University

Programmable RNA sensors for internal states and external cues

2:20 PM – 2:40 PM | Group 2 Discussion

Conversation 3

Moderator: Tullia Bruno, University of Pittsburgh

2:40 PM – 2:50 PM | Systems Biology

Lucas Pelkmans, University of Zurich

Multimodal perception by individual cells links cellular state to drug response

2:50 PM – 3:00 PM | Synthetic Biology

Josh Leonard, Northwestern University

Synthetic biology tools for probing and modulating the tumor microenvironment

3:00 PM – 3:20 PM | Group 3 Discussion

3:20 PM – 3:35 PM | Break

Collaborative Session

3:35 PM – 4:05 PM | Breakout Discussions

Participants will select a conversation for deeper discussion.

Conversation 1

Facilitators: Sean Hanlon (NCI) & Lillian Kuo (NCI)

Conversation 2

Facilitators: Kevin Howcroft (NCI) & Michelle Berny-Lang (NCI)

Conversation 3

Facilitators: Hannah Dueck (NCI) & Kelly Crotty (NCI)

4:05 PM – 4:30 PM | Final Panel Discussion

Moderators and speakers reflect on key insights and next steps.

Spatiotemporal biology of drug response and resistance

Date: May 20, 2025

Time: 12:00 PM – 4:30 PM ET

Location: Virtual & Online Collaboration Space

Meeting Co-Chairs: Laura Heiser (Oregon Health & Science University) & Ajit Nirmal (Harvard University)

AGENDA

12:00 PM – 12:15 PM | Welcome & Keynote Introduction

- Jennifer Couch, Branch Chief, Division of Cancer Biology, NCI
- Laura Heiser, Oregon Health & Science University
- Ajit Nirmal, Harvard University

12:15 PM – 12:55 PM | Keynote Presentation

Gordon Mills, Oregon Health and Science University

Targeting adaptive responses in cancer through spatiotemporal analysis

12:55 PM – 1:05 PM | Keynote Q&A

Conversation 1

Moderator: Kathryn Miller-Jensen, Yale

1:05 PM – 1:15 PM | Systems Biology

Matt Thomson, Caltech

Design of cancer immunotherapies with cell-interaction foundation models

1:15 PM – 1:25 PM | Synthetic Biology

Brian Brown, Mount Sinai Medical Center

Scaling up studies of tumor composition, heterogeneity, and drug response by spatial functional genomics

1:25 PM – 1:45 PM | Group 1 Discussion

1:45 PM – 2:00 PM | Break

Conversation 2

Moderator: Stacey D. Finley, University of Southern California

2:00 PM – 2:10 PM | Systems Biology

Andriy Marusyk, Moffitt

The impact of microenvironmental heterogeneity on therapeutic sensitivities and evolutionary dynamics in targetable lung cancers

2:10 PM – 2:20 PM | Synthetic Biology

Pulin Li, Massachusetts Institute of Technology

Harnessing synthetic biology to chart tissue signaling landscapes

2:20 PM – 2:40 PM | Group 2 Discussion

Conversation 3

Moderator: Karmella Haynes, Emory University

2:40 PM – 2:50 PM | Systems Biology

Arjun Raj, University of Pennsylvania

How can we quantify the relative influence of space and identity on resistant states?

2:50 PM – 3:00 PM | Synthetic Biology

Justin Pritchard, Pennsylvania State University

Spatial and temporal considerations for selection gene drives

3:00 PM – 3:20 PM | Group 3 Discussion

3:20 PM – 3:35 PM | Break

Collaborative Session

3:35 PM – 4:05 PM | Breakout Discussions

Participants will select a conversation for deeper discussion.

Conversation 1

Facilitators: Asif Rizwan (NCI) & Monica Zamisch (NCI)

Conversation 2

Facilitators: Nichole Daringer (NIBIB) & Hannah Dueck (NCI)

Conversation 3

Facilitators: Andrew Kurtz (NCI) & Michelle Berny-Lang (NCI)

4:05 PM – 4:30 PM | Final Panel Discussion

Moderators and speakers reflect on key insights and next steps
