AACR Special Conference in Cancer Research
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
July 10-12, 2025 | Montreal, QC, Canada

AACR
American Association for Cancer Research

COCHAIRS:

Valentina Boeva, ETH Zurich, Zurich, Switzerland
Marzyeh Ghassemi, Massachusetts Institute of Technology, Cambridge, Massachusetts
Benjamin Haibe-Kains, UHN Princess Margaret Cancer Centre, Toronto, Ontario, Canada
Bo Wang, University of Toronto and Vector Institute, Toronto, Ontario, Canada

THURSDAY, JULY 10

Registration
4-8:30 P.M. | Grand Salon Opera Foyer

Welcome and Keynote Lecture
6:30-7:15 P.M. | Grand Salon Opera AB

6:30-6:35	Welcome and Introduction of Keynote Speaker Valentina Boeva, ETH Zurich, Zurich, Switzerland
6:35-7:05	Computational approaches to mapping cells, tissues and tumor progression, where does AI help? Dana Pe'er, Memorial Sloan Kettering Cancer Center, New York, New York
7:05-7:15	Discussion / Q&A

Poster Session A / Opening Reception
7:30-9 P.M. | Soprano ABC and Foyer

FRIDAY, JULY 11

Continental Breakfast and Networking Roundtables
7-8 A.M. | Grand Salon Foyer and Grand Salon Opera C

Keynote Lecture
8-8:45 P.M. | Grand Salon Opera AB

8:00-8:05	Introduction of Keynote Speaker Benjamin Haibe-Kains, UHN Princess Margaret Cancer Centre, Toronto, Ontario, Canada
8:05-8:35	Empowering biomedical discovery with "AI scientists" Marinka Zitnik, Harvard University, Boston, Massachusetts
8:35-8:45	Discussion / Q&A

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Plenary Session 1: ML/AI for Drug Discovery, Repurposing, and Response Prediction
8:50-10:10 A.M. | Grand Salon Opera AB
Session Chair: Benjamin Haibe-Kains, UHN Princess Margaret Cancer Centre, Toronto, ON, Canada

8:50-9:15	Supporting anticancer drug discovery by knowledge graph mining and cancer target-focused cheminformatics modeling
	Alexander Tropsha, University of North Carolina, Chapel Hill, North Carolina
9:15-9:20	Discussion / Q&A
9:20-9:45	Virtual cells and digital twins - AI in personalized oncology
	Charlotte Bunne, Swiss Federal Institute of Technology Lausanne (EPFL), Lausanne, Switzerland
9:45-9:50	Discussion / Q&A
9:50 –10:05	AI-Predict: Artificial intelligence-mediated drug synergy prediction and validation in cancer models*
	Alicia Pliego, University of Zurich, Zurich, Switzerland
10:05-10:10	Discussion / Q&A

Coffee Break
10:10-10:25 A.M. | Grand Salon Foyer

Plenary Session 2: ML/AI for Genomic and Temporal Predictions
10:25-11:45 A.M. | Grand Salon Opera AB
Session Chair: Bo Wang, University of Toronto and Vector Institute, Toronto, Ontario, Canada

10:25-10:50	Spatial cell-state dynamics in the tumor microenvironment
	Samantha Riesenfeld, University of Chicago, Pritzker School of Molecular Engineering, Chicago, Illinois
10:50-10:55	Discussion / Q&A
10:55-11:20	Illuminating the Dark Cancer Genome using Foundation Models
	Raul Rabadan, Columbia University Irving Medical Center, New York, New York
11:20-11:25	Discussion / Q&A
11:25-11:40	Genomic alterations associate with distinct tumor dynamics in NSCLC: A genomics-informed Bayesian hierarchical modeling approach*
	Nikolaos Dimitriou, Memorial Sloan Kettering Cancer Center, New York, New York
11:40-11:45	Discussion / Q&A

Break
11:45 A.M.-12 P.M. | Grand Salon Foyer

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*-short talk from proffered abstracts

AI Synergy Forum: Fostering Collaboration Through Innovation
12-12:45 P.M. | Grand Salon Opera AB
Session Chair: Benjamin Haibe-Kains, UHN Princess Margaret Cancer Centre, Toronto, ON, Canada

12-12:05	Theme 1: Open science: Data and code sharing + reusability
	Shirin A. Enger, McGill University, Montreal, Quebec, Canada
12:05-12:10	Theme 2: AI using non/minimally invasive modalities for cancer applications
	Florian Markowetz, Cancer Research UK Cambridge Institute, Cambridge, UK
12:10-12:15	Theme 3: Monitoring model performance/drift in research and clinical settings
	Elana J. Fertig, University of Maryland, Baltimore, Maryland
12:15-12:20	Theme 4: The case for collaboration for real world impact
	Skye Bork, PACT AI
12:20-12:45	Panel Discussion

Panelists:
Skye Bork, PACT AI
Jian Carrot-Zhang, Memorial Sloan Kettering Cancer Center, New York, New York
Shirin A. Enger, McGill University, Montreal, Quebec, Canada
Elana J. Fertig, University of Maryland, Baltimore, Maryland
Florian Markowetz, Cancer Research UK Cambridge Institute, Cambridge, UK
Raul Rabadan, Columbia University Irving Medical Center, New York, New York

Free time / Lunch on Own
12:45-2:15 P.M.

Plenary Session 3: Multimodal AI for Clinical Applications in Oncology
2:15-3:35 P.M. | Grand Salon Opera AB
Session Chair: Dana Pe'er, Memorial Sloan Kettering Cancer Center, New York, New York

2:15-2:40	**Generative AI for improved digital pathology model predictions and interpretability [R]**
	Christina Curtis, Stanford University, Stanford, California, USA
2:40-2:45	Discussion / Q&A
2:45-3:10	Alignment and integration of spatial multi-omics tumor profiles
	Ben Raphael, Princeton University, Princeton, New Jersey
3:10-3:15	Discussion / Q&A
3:15 –3:30	Inferring genomic properties and histologic subtypes of solid tumors from H&E whole-slide images*

Kevin Boehm, MSKCC, New York, New York

3:30-3:35   Discussion / Q&A

*-short talk from proffered abstracts
 [R] – Remote Presentation

Break
3:35-3:50 P.M. | Grand Salon Foyer

Plenary Session 4: Bias and Fairness in AI Research and Deployed Models
3:50-5:10 P.M. | Grand Salon Opera AB
Session Chair: Benjamin Haibe-Kains, UHN Princess Margaret Cancer Centre, Toronto, Ontario, Canada

3:50-4:15   Uncovering and mitigating bias in auto-segmentation models in
                   radiation oncology
                   Benjamin Haibe-Kains, UHN Princess Margaret Cancer Centre, Toronto, Ontario,
                   Canada
4:15-4:20   Discussion / Q&A

4:20-4:45   Beyond assistance: Rethinking AI-human integration in radiology [R]
                   Pranav Rajpurkar, Harvard University, Boston, Massachusetts
4:45-4:50   Discussion / Q&A

4:50-5:05   A practical framework for operationalizing responsible and equitable
                   AI in healthcare: Tackling bias, inequity, and implementation challenges*
                   Benjamin Grant, Cancer Digital Intelligence, Princess Margaret Cancer
                   Centre, Toronto, Ontario, Canada
5:05-5:10   Discussion / Q&A

Break
5:10-5:25 P.M. | Grand Salon Foyer

Plenary Session 5: Cancer Applications of Foundation Models
5:25-6:45 P.M. | Grand Salon Opera AB
     Session Chair: Valentina Boeva, ETH Zurich, Zurich, Switzerland

5:25-5:50   Cancer-specific foundation models: Friend or foe in healthcare AI?
                   Valentina Boeva, ETH Zurich, Zurich, Switzerland
5:50-5:55   Discussion / Q&A

5:55-6:20   Evaluating and overseeing large language models for
                   oncology
                   Danielle S. Bitterman, Harvard Medical School, Boston, Massachusetts
6:20-6:25   Discussion / Q&A

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6:25-6:40	Learning the language of somatic mutations: A large language model approach to precision oncology*
	John-William Sidhom, Weill Cornell Medicine, New York, New York
6:40-6:45	Discussion / Q&A

*-short talk from proffered abstracts
[R] – Remote Presentation

Poster Session / Reception
7-9 P.M. | Soprano ABC and Foyer

SATURDAY, JULY 12

Continental Breakfast and Networking Roundtables
7-8 A.M. | Grand Salon Foyer and Grand Salon Opera C

Keynote Lecture 3: AI for Image Analysis
8-8:45 P.M. | Grand Salon Opera AB

8-8:05	Introduction of Keynote Speaker
	Bo Wang, University of Toronto and Vector Institute, Toronto, Ontario, Canada
8:05-8:35	Accelerating oncology drug discovery with the power of microscopy and AI
	Anne Carpenter, Broad Institute, Cambridge, Massachusetts
8:35-8:45	Discussion / Q&A

Plenary Session 6: ML/AI for Single Cell and Spatial Data, H&E, and Molecular Biomarker Discovery
8:50-10:10 A.M. | Grand Salon Opera AB
Session Chair: Ben Raphael, Princeton University, Princeton, NJ

8:50-9:15	**Forecasting tumor-immune dynamics in pancreatic cancer**
	Elana J. Fertig, University of Maryland, Baltimore, Maryland
9:15-9:20	Discussion / Q&A
9:20-9:45	Towards fast and accessible precision oncology
	Ruppin Eytan, National Cancer Institute, Bethesda, Maryland
9:45-9:50	Discussion / Q&A
9:50-9:57	Analysis of pathologists' intraobserver, interobserver and AI agreement in breast cancer HER2 scoring: AI-assessed intra-sample tumor heterogeneity relates to lower agreement among pathologists and with AI*
	Pedro Simonis S. M. Ferrari, D'Or Institute of Research & Education, São Paulo, Brazil
9:57-10	Discussion / Q&A

10-10:07	Path2Space: An AI approach for cancer biomarker discovery via histopathology inferred spatial transcriptomics*
	Emma Campagnolo, National Cancer Institute (NIH), Bethesda, Maryland, United States
10:07-10:10	Discussion / Q&A
10:10-10:20	Automated segmentation pipeline for radiological imaging using UniverSeg and similarity-guided support set retrieval*
	Niket Patel, Drexel University College of Medicine, Philadelphia, Pennsylvania
10:20-10:25	Discussion / Q&A

*-short talk from proffered abstracts

Coffee Break
10:25-10:45 A.M. | Grand Salon Foyer

Plenary Session 7: ML/AI for Radiological Imaging
10:45 A.M.-11:50 A.M. | Grand Salon Opera AB
Session Chair: Anne Carpenter, Broad Institute, Cambridge, Massachusetts

10:45-11:10	**ML/AI for radiological imaging**
	Catherine Coolens, University Health Network, Toronto, Ontario, Canada
11:10-11:15	Discussion / Q&A
11:15-11:40	**Integration of pathology with radiological imaging to extract biological signals for treatment guidance**
	Caroline Chung, UT MD Anderson Cancer Center, Houston, Texas
11:40-11:45	Discussion / Q&A

Plenary Session 8: How do we make AI research better for society!
11:50-1:20 P.M. | Grand Salon Opera AB
Session Chair: Elana J. Fertig, University of Maryland, Baltimore, Maryland

11:50-12:15	**Research in ethical machine learning and health [R]**
	Marzyeh Ghassemi, Massachusetts Institute of Technology, Cambridge, Massachusetts
12:15-12:20	Discussion / Q&A
12:20-12:45	**Building, scaling and using AI engines**
	Jeff Leek, Fred Hutchinson Cancer Center, Seattle, Washington
12:45-12:50	Discussion / Q&A
12:50-1:15	The impact of bringing complex data to the point of care
	Casey Greene, University of Colorado, Aurora, Colorado
1:15-1:20	Discussion / Q&A

Closing Remarks and Departure

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