Early Cancer Institute Annual Symposium 2024

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1st October 2024
2-6pm

CRUK Cambridge Institute
Robinson Way, Cambridge
CB2 0RE

Early Cancer Institute

UNIVERSITY OF CAMBRIDGE

Programme

14:00 **Opening Remarks**
Prof Rebecca Fitzgerald, Early Cancer Institute Director

Session 1 chair: Dr Jamie Blundell

14:10 **Keynote: Prof Titus Brinker**
The era of interpretable AI in cancer prevention and early detection

14:50 **Dr Danielle Harper**
Exploring new opportunities in tumour margin identification through optical guidance

15:05 **Dr Siddhartha Kar**
Insights into cancer development from genetic epidemiology

15:20-15:45: Break and poster session

Session 2 chair: Dr Alex Frankell

15:45 **Early Career lightning talks**

Dr Adriana Fonseca
Methylation dynamics in the decades preceding Acute Myeloid Leukaemia

Giovanna Mantica
DNMT3A R882 mutation in human haematopoietic stem cells alters myeloid differentiation dynamics

Bill McGough
Early detection of renal cancer using deep learning in low-dose computed tomography

16:15 **Dr Mireia Crispin**
To see a World in a Grain of Sand: imaging early cancer with AI

16:30 **Keynote: Prof Simon Leedham**
Using spatial biology to quantitatively map cell interactions in colorectal cancer progression from a benign adenoma precursor

17:10 **Prof Rebecca Fitzgerald**
Closing remarks followed by **Posters** and **Networking**

ECI Annual Symposium 2024 speakers

In agenda order

Rebecca Fitzgerald OBE FMedSci FRS HonFREng - Professor of Cancer Prevention. Director, Early Cancer Institute, University of Cambridge

After training in Cambridge, Stanford University, St Barts and the London Hospitals, Rebecca started her own group focusing on earlier detection of oesophageal and gastric cancer which have some of the poorest outcomes of all solid tumours.

Her pioneering work to devise a first-in-class, non-endoscopic capsule sponge test for identifying individuals at high risk for oesophageal cancer has won numerous prizes, including the Westminster Medal, and this test is now being rolled out in the NHS and beyond by her spin-out Cyted Ltd. Rebecca is passionate to bring translational science and entrepreneurship to the Early Cancer Institute so that we can fulfil our vision to predict and prevent cancer.

Jamie Blundell - Research Group Leader, Early Cancer Institute, University of Cambridge

Session 1 Chair

Jamie trained as a theoretical physicist at the Cavendish laboratory, University of Cambridge with Eugene Terentjev studying the statistical physics of polymers. He moved to Stanford University in 2012 as a postdoctoral scholar working on the dynamics of clonal evolution with Daniel Fisher, Sasha Levy, Dmitri Petrov and Gavin Sherlock. He joined the CRUK Cambridge Centre Early Detection program in July 2017 and was awarded a UKRI Future leaders fellowship in September 2019 which funds much of the group's research. His research interests lie in quantitatively understanding somatic evolution in human tissues and using this understanding to detect cancer earlier. He is also the Anthony L. Lyster fellow at Queens' College, Cambridge.

Titus Brinker - Research Group Leader, Digital Biomarkers for Oncology, German Cancer Research Center (DKFZ), Heidelberg

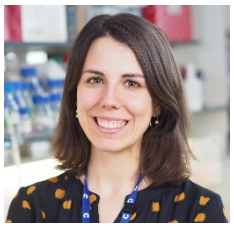
Titus Brinker is the head of the Junior Research Group 'Digital Biomarkers for Oncology' and clinician scientist at the German Cancer Research Center (DKFZ) where his research programme is focused on cancer prevention, early diagnosis, and improved therapy control via digital approaches. Dr Brinker has developed a number of digital apps for smoking and melanoma prevention. His group has expertise in the image classification domain with a particular focus on skin, colorectal, prostate and breast cancer. Titus' pioneering work in leveraging AI technology to improve early detection methods for skin cancer has earned him many awards including the 'Vision-Zero' Innovation Award and AI Champions Baden-Württemberg 2023.

Danielle Harper – Research Group Leader, Early Cancer Institute, University of Cambridge

Danielle recently joined the University of Cambridge as a Group Leader at the Early Cancer Institute and the Department of Physics. She received her MPhys degree in Physics from the University of St Andrews, and her PhD in Medical Physics at the Medical University of Vienna in Austria in the field of high-resolution Optical Coherence Tomography.

In 2020, she joined the lab of Benjamin J. Vakoc at the Wellman Center for Photomedicine (Massachusetts General Hospital/Harvard Medical School) as a Postdoctoral Research Fellow (2020-2023), and later Instructor (2023-2024), where she worked on both laser and system development for a range of clinical applications including cartilage disruption detection, retinal imaging, and neurosurgical guidance. In her new role at the University of Cambridge, she plans to

	tailor her optical imaging techniques to be suitable for cancer cell detection, with an ultimate goal of real-time intraoperative tumour margin assessment.
	**Siddhartha Kar – Research Group Leader (genetic epidemiology), Early Cancer Institute, University of Cambridge** Siddhartha studied medicine at the Byramjee Jeejeebhoy Government Medical College and trained at the Sassoon General Hospitals in Pune, India. He holds an MPH degree from the University of Texas at Houston in the US and a PhD from the University of Cambridge in the UK, where he was a Gates Cambridge Scholar between 2012 and 2015. Siddhartha was awarded a Future Leaders Fellowship by UKRI in 2020 that enabled him to establish his independent research group within the Medical Research Council (MRC) Integrative Epidemiology Unit at the University of Bristol. He returned to Cambridge as a Group Leader at the Early Cancer Institute in the Department of Oncology in March 2023.
	**Alex Frankell - Research Group Leader, Early Cancer Institute, University of Cambridge** *Session 2 Chair* Alex graduated in Cell Biology from the University of Durham in 2014. He then went on to complete his doctoral training in Rebecca Fitzgerald's lab at the MRC Cancer Unit (now Early Cancer Institute). From 2019 his postdoctoral research in Charles Swanton's lab at the Francis Crick Institute saw him working on the TRACERx project, for instance, studying how DNA released by lung tumours into the bloodstream can be used for non-invasive tracking of cancer evolution.
	**Adriana Fonseca – Research Associate, Blundell Group, Early Cancer Institute, University of Cambridge** Adriana is a Research Associate in the Blundell lab at the Early Cancer Institute, where she previously completed her PhD. She is funded by an ACED Early Career Pathway Award.
	**Giovanna Mantica – PhD student, Laurenti Group, Cambridge Stem Cell Institute/Department of Haematology, University of Cambridge** Giovanna graduated in Medicine and Surgery from the University of Pavia in 2019, with a research thesis on the role of Fibronectin isoform EDA in the pathogenesis of Primary Myelofibrosis. She then joined Prof. Elisa Laurenti's lab at the University of Cambridge to investigate haematopoietic stem cell function in IL-33-driven inflammation. In 2022, Giovanna began her PhD, funded by the CRUK Cambridge Cancer Centre. Her current research focuses on clonal haematopoiesis, with a particular focus on its functional implications on the myeloid branch of haematopoietic differentiation.
	**Bill McGough – PhD student, Crispin Group, Early Cancer Institute, University of Cambridge** Bill is a PhD student in the Crispin lab, working on the development of deep-learning AI for clinical applications. His background is in engineering, and his aims to spin out a start-up company based on the contents of this presentation, delivering high-agency AI to the NHS.



Mireia Crispin - **Research Group Leader, Early Cancer Institute, University of Cambridge**

Mireia is an Assistant Professor in the Department of Oncology at the University of Cambridge and leads a research group focusing on the development of multi-omic data integration models to understand response cancer therapies. She is also the Chief Digital Officer of 52 North Health, an award-winning biotech start-up developing affordable at-home tests for cancer patients. Dr Crispin worked previously at Memorial Sloan Kettering Cancer Center in New York and was the Director of the Healthcare Innovation programme of the Center for the Governance of Change at IE University (Madrid, Spain), focusing on policy challenges for the integration of AI and digital health in European healthcare. She holds a PhD in Particle Physics (University of Oxford, 2015). She has received numerous national and international awards, most recently finalist of the Cancer Research Horizons Early-Career Entrepreneur of the Year 2022 award.

Simon Leedham - **Professor of Molecular and Population Genetics and Honorary Consultant Gastroenterologist at the University of Oxford**

Simon Leedham is a Professor of Molecular and Population Genetics and an Honorary Consultant Gastroenterologist at the University of Oxford. His research is into the morphogenic signalling pathways that control the intestinal stem cell in homeostasis, regeneration and cancer, and he has published more than 100 peer reviewed papers in journals that include Nature, Nature Medicine, Nature Genetics, Cell Stem Cell, Gastroenterology and Gut. Simon's research has been recognised by the United European Gastroenterology Rising Star award in 2010, the British Society of Gastroenterology Francis Avery Jones research prize in 2015 and the CRUK Future Leaders prize in 2017.

Posters

Please view the posters during the break and the final networking session

Poster number	Title	Author	Affiliation
1	Early detection of renal cancer using deep learning in low-dose computed tomography	Bill McGough	Early Cancer Institute, University of Cambridge
2	Fine-scale mapping of T-cell receptor antigen interactions	Abigail Colley	Early Cancer Institute, University of Cambridge
3	Lenalidomide: A more effective and safer alternative to HAART and conventional treatments for AIDS-related Kaposi's Sarcoma.	Adewunmi Akingbola	Dept of Public Health and Primary Care, University of Cambridge
4	The ACED Cohort study: A bioresource to support early detection of cancer research	Alice Groves	Early Cancer Institute, University of Cambridge
5	Understanding the barriers to breast cancer screening and the effectiveness of interventions to address them, experienced by women of Black African and Black Caribbean descent in the UK	Anietie Aliu	University of Surrey
6	Ovarian cancer growth kinetics – implications for cancer early detection	Bharath Narayanan	Dept of Public Health and Primary Care, University of Cambridge
7	In-situ characterisation of signet ring cell foci in hereditary diffuse gastric cancer patients	Claire Lim	Early Cancer Institute, University of Cambridge
8	Profiling the heterogeneity of Barrett's oesophagus using single cell-derived organoids	Daniel Jacobson	Early Cancer Institute, University of Cambridge
9	The age-related deceleration of clonal haematopoiesis in the UK Biobank	Hamish MacGregor	Early Cancer Institute, University of Cambridge
10	Exploring the influence of cGAS-STING signalling on the initiation and progression of lung cancer	Jana Zäh	Early Cancer Institute, University of Cambridge
11	Artificial intelligence (AI) and cancer care in Africa	Jessica Utomara	Anglia Ruskin University

12	Genome-wide analysis in over 363,000 individuals identifies new multi-omic determinants of clonal haematopoiesis and haematopoietic mosaic chromosomal alterations	Jonathan Bowles	Early Cancer Institute, University of Cambridge
13	Multispectral endoscopes for detecting early oesophageal cancer	Katie-Lou White	Dept of Physics, University of Cambridge & Cancer Research UK Cambridge Institute
14	Exploring DNA methylation aberrations to distinguish high and low-risk prostate cancer	Lucy Faulkner	Early Cancer Institute, University of Cambridge
15	Investigating the role of intratumoural heterogeneity in treatment resistance in diffuse midline gliomas	Michael McNicholas	Dept of Oncology, University of Cambridge
16	Urinary detection of chemotherapy-induced senescence and pulmonary fibrosis via a nanosensor of MMP-7 activity	Muhamad Hartono	Early Cancer Institute, University of Cambridge
17	Investigating immune recognition of clonal haematopoiesis: legacy TCR study	Sam Hackett	Early Cancer Institute, University of Cambridge
18	Understanding bowel cancer screening intention across different populations: Identifying predictors of bowel cancer screening intention and investigating bowel cancer screening interventions	Soumya Shetty	University of Leeds
19	Pan-viral serological characterization in African Americans and European Americans with Hepatocellular Carcinoma	Theressa Ewa	Early Cancer Institute, University of Cambridge
20	Are pre-cancer clonal expansions in the blood under immune surveillance?	Barbara Walkowiak, Hamish MacGregor, Jamie Blundell	Early Cancer Institute, University of Cambridge
21	Exploring the use of glioma specific TCRs extracted from the periphery, for the use in early detection	Jinqi Fu, Shelley Evans, Matthaios Pitoulias, Sam Hackett, Abi Coley, Richard Mair, Elizabeth Soilleux, Jamie Blundell	Early Cancer Institute, University of Cambridge

Upcoming events

We organise a range of events throughout the year for those in the early cancer research space to promote collaboration and knowledge sharing.

Keep an eye on our events page:
www.earlycancer.cam.ac.uk/events

15th October

Early Cancer Institute seminar: Prof Utkan Demirci

Impacting medicine with microfluidics & nanotechnology: Advancing diagnostics and medicine.

7th November

Cambridge Symposium on Oesophageal cancer CamSoc2024

The full-day Cambridge Symposium on Oesophageal Cancer takes place on **Thursday 7 November 2024**. Join us to learn about the latest fundamental, translational, and clinical advances in oesophageal cancer research.

19th November

Early Cancer Institute seminar: Dr Calum Gabbutt

Leveraging inference of cancer evolution to improve patient stratification.

2025 - TBA

Multidisciplinary networking event

Focus on biomedical engineering for early cancer detection.