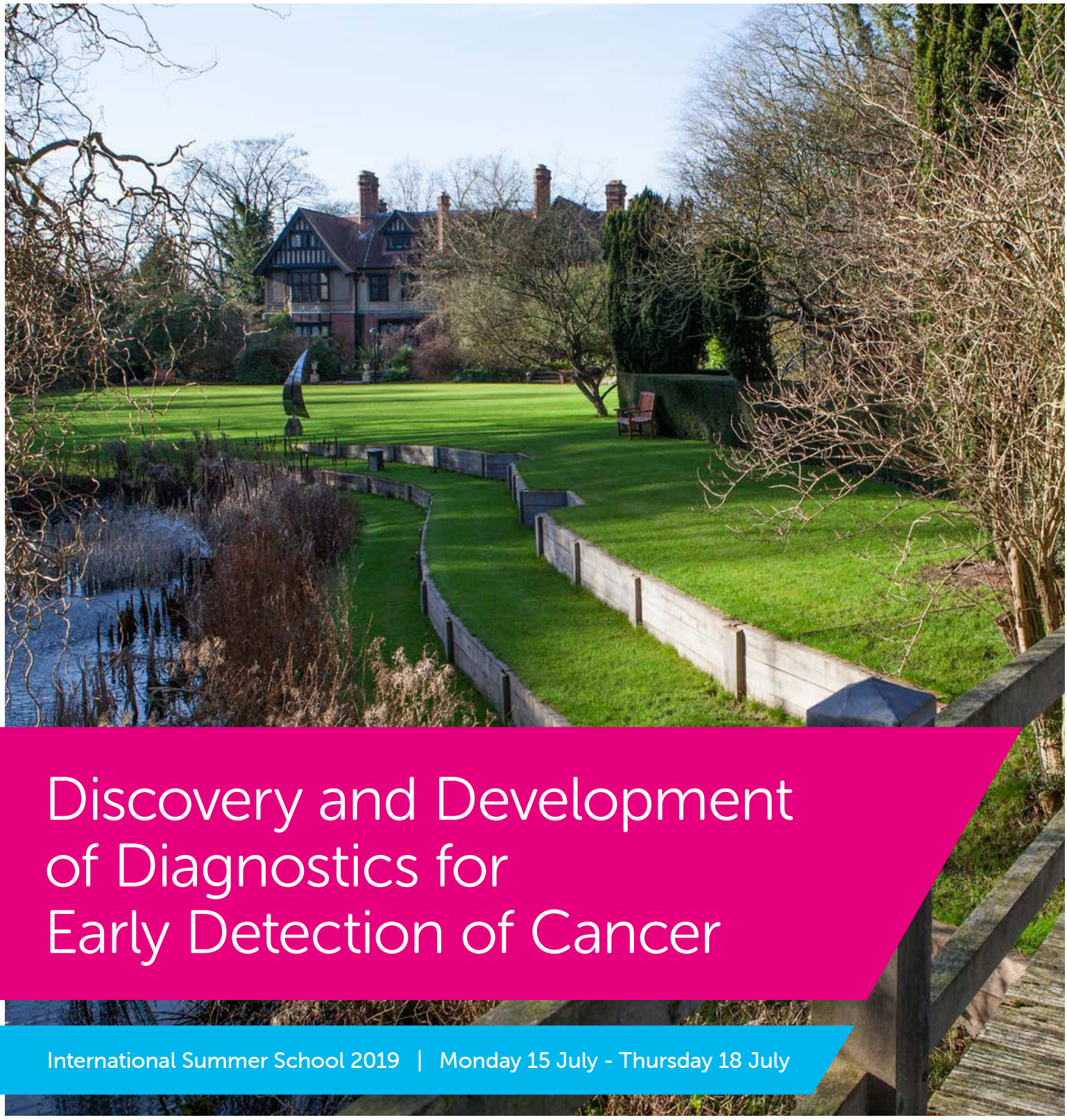
CANCER RESEARCH UK | CAMBRIDGE CENTRE

EARLY DETECTION PROGRAMME



Discovery and Development of Diagnostics for Early Detection of Cancer

International Summer School 2019 | Monday 15 July - Thursday 18 July

UNIVERSITY OF CAMBRIDGE

SUMMER SCHOOL
EARLY DETECTION OF CANCER

Welcome

We are delighted to welcome you to the first International Summer School on the Discovery and Development of Diagnostics for the Early Detection of Cancer, brought to you by the CRUK Cambridge Centre Early Detection Programme.

The vision of the CRUK Cambridge Centre Early Detection Programme is to increase survival from cancer and improve quality of life through early detection and intervention. This summer school brings together those who share this vision - be they developing new technologies for the early detection of cancer; studying the early stages of cancer development; examining the broader implications of early detection for society as a whole or interested in exploring this rapidly expanding and exciting field further. The learning and networking opportunities that this residential course provides will enable a vibrant exchange of ideas and drive this vision forward.

We are very grateful for the generous support of Cancer Research UK which enables us to offer this summer school at a subsidised rate, and to secure the best speakers for the course. We would also like to thank Arizona State University whose experts will guide the delegates in an activity over the duration of the Summer School to develop and present a business case for a new test for the early detection of cancer.

The Early Detection Programme Manager and Administrators, Wendy, Catherine and Lieneke, have worked tirelessly towards presenting an excellent first International Summer School. In addition, we would particularly like to thank Stuart Hogarth for his guidance.

We wish you an enjoyable and rewarding week!

Prof Rebecca Fitzgerald and Dr Sarah Bohndiek,
Co-Leads, CRUK Cambridge Centre Early Detection Programme

Senior Faculty

Mara Aspinall MD,
BlueStone Venture, USA

Dr Sarah Bohndiek
University of Cambridge, UK

Prof Rebecca Fitzgerald
University of Cambridge, UK

Dr Alberto Gutierrez
Former Director at FDA, USA

Prof Stuart Hogarth
University of Cambridge, UK

Prof Lynette Reid
Dalhousie University, Canada

Prof Maroeska Rovers
Radboud University, NL

Prof Peter Sasieni
King's College London, UK

Dr Sian Taylor-Phillips
University of Warwick, UK

Our Learning Objectives

The outstanding speaker line-up presenting at our Summer School will cover a broad range of aspects related to the subject, including case studies on the road to market for new early cancer detection diagnostics. It is our aim at the end of the course for delegates to have gained a deeper understanding of the necessity for, and challenges of, delivering new tests for early cancer detection.

We aim to address the challenge of building an early detection research community by encouraging a cohort that will continue to be active in the field and will develop new local and international collaborations, with networks of professional support for junior and mid-career researchers. Specifically, the delegates will leave the School with an understanding of:

- The need for early cancer detection and challenges of delivering new tests to clinical implementation
- An overview of the current early detection technologies being developed
- The commercialisation process of early detection technologies
- Regulatory frameworks for cancer screening technologies
- The basic principles of clinical trial design for early detection of cancer
- The evaluation and evidence review of new tests
- Public health policy for cancer screening
- Some of the ethical and societal implications of early detection of cancer

Speakers

Dr Barry Berger
Exact Sciences Corporation, USA

Billy Boyle
Owlstone Medical Ltd

Prof Chris Contag
Michigan State University, USA

Prof Rebecca Fitzgerald
University of Cambridge, UK

Dr Alberto Gutierrez
Former Director at FDA, USA

Dr Stephen John
University of Cambridge, UK

Prof Attila T. Lorincz
QMUL, UK

Prof Anne Mackie
Public Health England

Dr Maryon McDonald
University of Cambridge, UK

Robyn Meurant
NSF International

Prof Nickolas Papadopoulos
John Hopkins University, USA

Prof Stephen Quake
Stanford University, USA

Prof Lynette Reid
Dalhousie University, Canada

Prof Maroeska Rovers
Radboud University, NL

Dr Sian Taylor-Phillips
University of Warwick, UK

Dr Fiona Walter
University of Cambridge, UK

Dr Henrik Winther
Immunovia AB, Sweden

Dr Carl Yamashiro
Arizona State University, USA

Associates

Dr Wendy Alderton
Programme Manager and Scrum Master

Catherine Atkins
Administrator

Dr Jamie Blundell
Early Detection Group Leader and Session Chair

Lieneke Makaske
Administrator

Dr Charlie Massie
Early Detection Group Leader and Scrum Master

Dr Daniel Muñoz-Espín
Early Detection Group Leader and Scrum Master

Cindy Azevedo
Scrum Master

Dr Valerie Sills
Scrum Master

Programme

Monday 15 July

Session 1: Introduction to Early Detection of Cancer
Moderated by Dr Sarah Bohndiek

13:45-14:00	Session 1.1: Welcome and introduction Dr Sarah Bohndiek
14:00-14:45	Session 1.2: The need for early detection and Cytosponge™ case study Prof Rebecca Fitzgerald
14:45-15:30	Session 1.3: Cancer screening as a public health policy challenge Prof Anne Mackie
15:30-16:00	Break
16:00-16:45	Evidence-based interventions for early detection and prevention of prostate cancer Prof Maroeska Rovers
16:45-17:30	Session 1.4: Introduction to team exercise: Envisioning New Diagnostics & first team meeting Dr Carl Yamashiro
18:00	Icebreaker and debate: 'Consumer Genomics' (Venue: Crausaz Wordsworth Lecture Theatre) Facilitators: Mara Aspinall MD, BlueStone Venture, USA and Prof Stephen Quake, Stanford University

Tuesday 16 July

Session 2: Science and Technology of Diagnostics
Moderated by Dr Jamie Blundell

09:00-09:45	Session 2.1: Liquid biopsy biomarkers and CancerSEEK Prof Nickolas Papadopoulos
09:45-10:30	Session 2.2: Optical imaging for the early detection of cancer Prof Chris Contag
10:30-11:00	Break
11:00-11:45	Session 2.3: Precision measurement of biology: application to early detection of cancer Prof Stephen Quake
11:45-13:00	Lunch

Session 3: Case studies for Science/Technology of Diagnostics
Moderated by Dr Mara Aspinall

13:00-13:45	Session 3.1: Immunovia - IMMray™ PanCan-D Dr Henrik Winther
13:45-14:30	Session 3.2: Exact Sciences - Cologuard® Dr Barry Berger
14:30-15:00	Break
15:00-17:00	First session of team activity in breakout rooms
Evening	Barbecue in Robinson College Gardens

Wednesday 17 July

Session 4: Regulation and Evidence Review
Moderated by Dr Wendy Alderton

09.00-09.45	Session 4.1: Regulation of early detection diagnostics (US/EU) Dr Alberto Gutierrez
09:45-10:30	Session 4.2: Evidence review of new screening tests Dr Sian Taylor-Phillips
10:30-11:00	Break
11:00-11:45	Session 4.3: Technical validation from a lab director's perspective Dr Robyn Meurant
11:45-13:00	Lunch

Session 5: Clinical Trials and Implementation
Moderated by Prof Rebecca Fitzgerald

13:00-13:45	Session 5.1: Design of clinical trials for early detection of cancer Prof Peter Sasieni
13:45-14:30	Session 5.2: Cancer testing in primary care (the CanTest collaborative) Dr Fiona Walter
14:30-15:15	Session 5.3: Case study: pathway to adoption. Qiagen Digene HPV test Prof Attila T. Lorincz
15:15-15:30	Break
15:30-17:30	Second session of team activity in breakout rooms
Evening	Gala dinner in Robinson College Dining Hall Speaker: Billy Boyle, Owlstone Medical Ltd

Thursday 18 July

09:00-10:30	Third session of team activity in breakout rooms
10:30-11:00	Break

Session 6: Panel discussion and Q&A session on societal impacts of early detection of cancer
Moderated by Dr Stuart Hogarth

11:00-12:30	Session 6.1: Panel discussion and Q&A session on societal impacts of early detection of cancer Prof Lynette Reid Dr Stephen John Dr Maryon McDonald
12:30-13:00	Lunch
13:00-14:30	Fourth session of team activity in breakout rooms
14:30-14:45	Break
14:45-16:30	Presentations of team activity, prizes and conclusion of summer school.

Extended programme

Monday 15 July

Learning objectives:

- To understand the need for early cancer detection
- To understand some of the challenges of early detection
- To introduce participants to the summer school and the team exercise

Session 1: Introduction to Early Detection of Cancer

Moderated by Dr Sarah Bohndiek

13:45-14:00

Welcome and introduction

Dr Sarah Bohndiek, University of Cambridge, UK

14:00-14:45

The need for early detection and Cytosponge™ case study

Prof Rebecca Fitzgerald, University of Cambridge, UK

Early diagnosis is an important strategy to improve outcomes from cancer. Oesophageal adenocarcinoma is an example of a cancer that presents late, with very poor outcomes, and for which the presence of the precursor lesion Barrett's oesophagus provides the opportunity to intervene at an early stage. In this talk, I describe the challenges in the field and the work that we have done to devise a conceptually novel approach to early diagnosis, using a cell collection device (Cytosponge™), coupled with molecular assays and how we are advancing this from research to a commercially available test for routine clinical use.

14:45-15:30

Cancer screening as a public health policy challenge

Prof Anne Mackie, Public Health England

This talk will cover why screening is different from other health interventions and what consequences that has for policy-making. I will look at the popularity problem for screening and at communication of risk. I will also consider when screening is not the right answer. I will discuss why early detection should be assessed using some of screening's criteria and processes.

15:30-16:00

Break

16:00-16:45

Evidence-based interventions for early detection and prevention of prostate cancer

Prof Maroeska Rovers, Radboud University, Netherlands

How do you know as a patient or doctor whether a new biomarker, diagnostic test, or intervention is better than the current alternative, or that a new medical device really has added value? During my presentation I will explain how early health technology assessment (HTA) methods can be used to inform, and thereby integrate, development, research and implementation decisions, and bridge the gap between development and use of promising innovations from a very early stage. The whole idea of early HTA will be introduced by playing a game together! I will clarify the methods using the example of the early detection and treatment of prostate cancer.

16:45-17:30

Introduction to team exercise: Envisioning New Diagnostics & first team meeting

Dr Carl Yamashiro, Arizona State University, USA

Over the duration of the School, all delegates will participate in a team activity led by experts from the International School of Biomedical Diagnostics at Arizona State University (ASU). Using the agile development method, popular in software design but ideal for complex projects, the teams will work together to develop and present a business plan for a test for early cancer detection. They will have to consider real-world issues such as market need, barriers to market, regulatory compliance, clinical trial design and many other relevant factors. On the final day of the Summer School the teams will present their ideas to their fellow course participants. This activity will enable the delegates to gain "hands on" experience of the considerations and potential pitfalls of technology development.

We are extremely grateful to Dr Carl Yamashiro and Dr George Runger (Arizona State University) and Dr Mara Aspinall (BlueStone Venture, USA) for their expertise in developing and leading this activity.

18:00
Lecture Theatre

Icebreaker and debate: 'Consumer Genomics'

Facilitators: Mara Aspinall MD, Bluestone Venture Partners, USA and Prof Stephen Quake, Stanford University

Tuesday 16 July

Learning objectives:

- To gain an overview of some of the current early detection technologies being developed
- To understand some of the challenges of bringing new diagnostic tests to market
- To gain an insight into the commercialisation process of early detection technologies

Session 2: Science and Technology of Diagnostics

Moderated by Dr Jamie Blundell

09:00-09:45

Liquid biopsy biomarkers and CancerSEEK

Prof Nickolas Papadopoulos, Johns Hopkins University, USA

Early detection of cancer in the screening and minimal residual disease settings has the potential to significantly reduce cancer deaths. Our goal is to be able to detect cancer earlier than current modalities. Previously, in-proof-of-principle studies, we determined the feasibility of liquid biopsy in detecting cancers in blood and other bodily fluids. In a recent study, we have been able to detect minimal residual disease with exquisite specificity after surgery in patients with stage II colon cancer earlier than recurrence detected by imagining. Recently, we developed a multi-cancer multi-analyte liquid biopsy for the detection and localization of cancers, called CancerSEEK. Due to either limitations of plasma-based liquid biopsy or because of the need of sensitive non-invasive tests for the detection of cancer that target certain cancer types, we have developed liquid biopsies utilizing other bodily fluids. We believe that a combination of bodily fluids and analytes will be needed for the earlier detection of cancer.

09:45-10:30

Optical imaging for the early detection of cancer

Prof Chris Contag, Michigan State University, USA

Current technologies for the detection of cancer lack the sensitivity for early detection at times when therapy would be most effective, and cannot detect minimal residual disease that persists after conventional therapies. To impact this disease, we will need to develop methods to sense and then visualize small numbers of cancer initiating cells and move from detection limits of 1 cm to 1 mm or even 100 µm diameter masses. Optical imaging has the sensitivity for this level of detection and there are a number of recent advances that will enable the use of optics in the clinic for cancer detection.

10:30-11:00 **Break**

11:00-11:45 **Precision measurement of biology: application to early detection of cancer**

Prof Stephen Quake, Stanford University, USA

Professor Quake's research is at the nexus of biology, physics and technology development. He has invented many measurement tools for biology, including new DNA sequencing technologies that have enabled rapid analysis of the human genome and microfluidic automation that allows scientists to efficiently isolate individual cells and decipher their genetic code. In this talk he will describe how the precision measurement of biology can be applied to the early detection of cancer.

11:45-13:00 **Lunch**

Session 3: Case studies for Science/Technology of Diagnostics

Moderated by Dr Mara Aspinall

13:00-13:45 **Immunovia - IMMray™ PanCan-D**

Dr Henrik Winther, Immunovia AB, Sweden

For the IMMray™ PanCan-d test, a biomarker algorithm, also known as a condensed signature, for patient sample classification was designed in-house through biostatistical data analyses including the use of SVM (Support Vector Machine) learning and BE (Backward Elimination) feature selection principles. Retrospective studies published in Journal of Clinical Oncology, 2018, show that IMMray™ PanCan-d, is able to detect stage I and stage II pancreatic cancer with an accuracy of 96%. The IMMray™ PanCan-d test is in its early commercialization stage with an expected launch in USA in the latter part of 2019.

13:45-14:30 **Exact Sciences - Cologuard®**

Dr Barry Berger, Exact Sciences Corporation, USA

New screening tests are among the most difficult and time consuming of clinical assays to fund, develop, and implement in daily practice. For these tests, the discovery of highly discriminant biomarkers is challenging and clinical trials are large, time consuming and expensive. The regulatory pathway to market is rigorous and clinical use requires broad based evaluation and recommendation by national guidelines groups, inclusion in quality metrics, and adequate reimbursement from national and commercial insurance carriers. Medical policy driven by cost effectiveness evaluation must be considered in light of the full societal burden imposed by non-screening and by alternative testing strategies accounting for direct and indirect costs and issues related to access and compliance. The evolution and clinical uptake of Cologuard®, a multi-target stool DNA based screening test for colorectal cancer and advanced colorectal adenomas is illustrative of this journey from basic research to bedside utility.

14:30-15:00 **Break**

15:00-17:00 **First session of team activity, in breakout rooms**

Evening **Barbecue**

Wednesday 17 July

Learning objectives:

- To understand the regulatory frameworks for cancer screening technologies
- To understand the basic principles of clinical trial design
- To gain an insight into the evaluation and review of new tests
- To gain an insight into cancer diagnostics in a primary care setting

Session 4: Regulation and Evidence Review

Moderated by Dr Wendy Alderton

09.00-09.45

Regulation of early detection diagnostics (US/EU)

Dr Alberto Gutierrez, Former Director at FDA, USA

The regulatory requirements necessary for approval of a medical device are based on the device's classification. Manufacturers of Class I devices, such as Band-Aids or pH tests, have to register their test with the FDA and follow general controls, such as adhering to good manufacturing practices, reporting device failures, and developing and using a system for remedying such failures (FDA, 2009b). The requirements for Class II and III devices are more complex. In this talk I will describe the regulatory landscape for early detection diagnostics.

09:45-10:30

Evidence review of new screening tests

Dr Sian Taylor-Phillips, University of Warwick, UK

How do we decide whether to start a screening programme? Will it do more good than harm? What about the opportunity cost – are there other health interventions which are a greater priority? In this session we explore different decision-making systems around the world to use the evidence to decide whether to start screening, including the Wilson and Jungner based systems in Europe, and analytic frameworks of the US Preventative Services Task Force.

10:30-11:00

Break

11:00-11:45

Technical validation from a lab director's perspective

Dr Robyn Meurant, NSF International

This presentation aims to identify lesser known parts of the journey to market. It will cover aspects of a diagnostic life cycle that are often stumbling blocks for start-ups and yet, if conquered, can bring a good idea to market faster and in better "shape". Topics will cover the need to understand the proposed intended use, risk management and the general principles of safety and performance, and how you can use these to define effective and informative studies and end up with a better, more marketable product.

11:45-13:00

Lunch

Session 5: Clinical Trials and Implementation

Moderated by Prof Rebecca Fitzgerald

13:00-13:45

Design of clinical trials for early detection of cancer

Prof Peter Sasieni, King's College London, UK

The technical and logistical demands of cancer diagnostics trials are significantly different from those typically seen in Clinical Trials Units (CTUs) which focus on therapeutics. The traditional phases of clinical trials do not translate easily to studies of diagnostic biomarkers, complex interventions to promote early detection, or cancer screening. Randomised controlled trials may not be the only unbiased design and other designs can often produce robust answers far more efficiently. Far more consideration needs to be given to the target population and to whether to conduct an efficacy or an effectiveness (pragmatic) trial. I shall describe designs that might be used for early phase, late-phase and post-implementation evaluation of cancer early detection; and discus the pros and cons of different endpoints for use in such trials. I will also briefly discuss designs that may seem less ethical such as Zelen designs, cluster randomised designs, and concealed/revealed randomisation, and argue that it is necessary to weigh the benefits of such a design and the potential impact of the trial on public health against the ethical harms.

13:45-14:30

Cancer testing in primary care (The CanTest collaborative)

Dr Fiona Walter, University of Cambridge, UK

Fiona Walter will introduce the CanTest Collaborative, a CRUK-funded international partnership of primary care cancer researchers. CanTest's remit is to investigate ways of developing and implementing emerging and existing cancer diagnostic tests and testing strategies into family doctor practices. Fiona will discuss CanTest's work on biomarker, imaging and technological advances for a range of cancers, and how we assess their acceptability, safety, effectiveness and cost effectiveness in the primary care setting.

14:30-15:15

Case study: pathway to adoption. Qiagen Digene HPV test

Prof Attila T. Lorincz, QMUL, UK

The pathway to adoption of an early detection diagnostic assay is strongly dependent on the nature of the test. Generally, the more novel the test the more barriers there are to entry. Hybrid Capture 2 (HC2) was the first Human Papilloma Virus (HPV) test that saw major routine diagnostic utilization. It took two decades of solid work for this to happen. Today there are more than one hundred commercial HPV tests, virtually all of which used HC2 as their performance goal exemplar. Indeed, the story continues and first-to-market tests may often be overwhelmed by fast followers who have the resources to take the lead. The pathway to adoption of an early detection diagnostic assay may, in the long term, be a story of both a rise and a fall from favour. In my talk I will give a mostly bird's eye view of the tortuous path to market success of HPV DNA testing that was made possible by the groundbreaking Qiagen Digene HPV Test.

15:15-15:30

Break

15:30-17:30

Second session of team activity, in breakout rooms

Evening

Gala dinner. Speaker: Billy Boyle, Owlstone Medical Ltd

Thursday 18 July

Learning objectives:

– To understand some of the ethical and societal implications of early detection of cancer

09:00-10:30 **Third session of team activity, in breakout rooms**

10:30-11:00 **Break**

Session 6: Panel discussion and Q&A session on societal impacts of early detection of cancer

Moderated by Dr Stuart Hogarth

11:00-12:30 **15-minute introductory talk from each speaker followed by Q&A**

Who is early detection for? Considerations of solidarity in cancer prevention

Prof Lynette Reid, Dalhousie University, Canada

It seems obvious that one chooses to screen or pursue early detection in the interest of one's own health. But choices around cancer screening are heavily informed by social factors: for example, friends and family who have histories of cancer appeal to us to get checked and to know our risk. Furthermore, the public participates in screening and early detection—and forgives its shortcomings—with the long-range, shared goal of "defeating cancer" in mind. Can we clarify ethical concerns around screening and early detection by understanding its place in the larger social project that is "cancer control"?

Fundamental ethical issues surrounding early detection technologies

Dr Stephen John, University of Cambridge, UK

This talk provides an overview of some of the fundamental ethical issues raised by ED technologies by focussing on a simple problem: even when they are effective, ED technologies can lead to overdiagnosis and overtreatment; as such, their use seems to conflict with a core principle of medical ethics, "non-maleficence" (or "do no harm"). In working through this problem, this talk touches on several core topics, including the relationship between clinical ethics and regulation, the role of informed consent in screening, and the ethical arguments for and against stratified medicine.

What might be the social consequences of having a test that indicates your risk of cancer?

Dr Maryon McDonald, University of Cambridge, UK

What might be the social consequences of having a test that indicates your risk of cancer?

This talk looks at what some of these might be – from anxiety to the everyday ethics of health concern. The possible consequences do not necessarily suggest that earlier detection is not a good thing – rather, they alert us to a world into which early detection might take us further, with some of the entanglements that might seem to result..

12:30-13:00 **Lunch**

13:00-14:30 **Fourth session of team activity, in breakout rooms**

14:30-14:45 **Break**

14:45-16:30 **Presentations of team activity, prizes and conclusion of summer school**

Things to do in Cambridge

The City of Cambridge is known the world over for its University, founded in 1209, but there is evidence that the settlement dates back to as early as the Bronze Age. While you are here why not take the opportunity to explore.

Have a walk through Robinson College garden

A Guide to the Gardens with maps and species lists is available from the Porters' Lodge, price £4. Proceeds go to the National Gardens Scheme charities.

Fitzwilliam Museum

Besides their broad collection, which ranges from pottery to old masters and armoury, the museum currently has two temporary exhibitions: "Beggarstaffs: William Nicholson & James Pryde" and "Fans Unfolded: Conserving the Lennox-Boyd collection".

Tues-Sat opening times: 10:00 – 17:00, Free admission

University Botanic Garden

A beautiful and fascinating collection of over 8000 plant species from all over the world, set in a wonderful series of landscapes. Opening times: 10:00 – 18:00 daily

Admission: £5 (£5.50 with gift aid)

Great St. Mary's Church – Climb the tower

Constructed over a period of time from 1478, the views from the tower are stunning. Enjoy a self-guided tour of the church and climb the tower if you're feeling energetic!

Opening times: 10:00 – 17:30 during weekdays

Church entry: free

Tower entry: £5

Punting in Cambridge

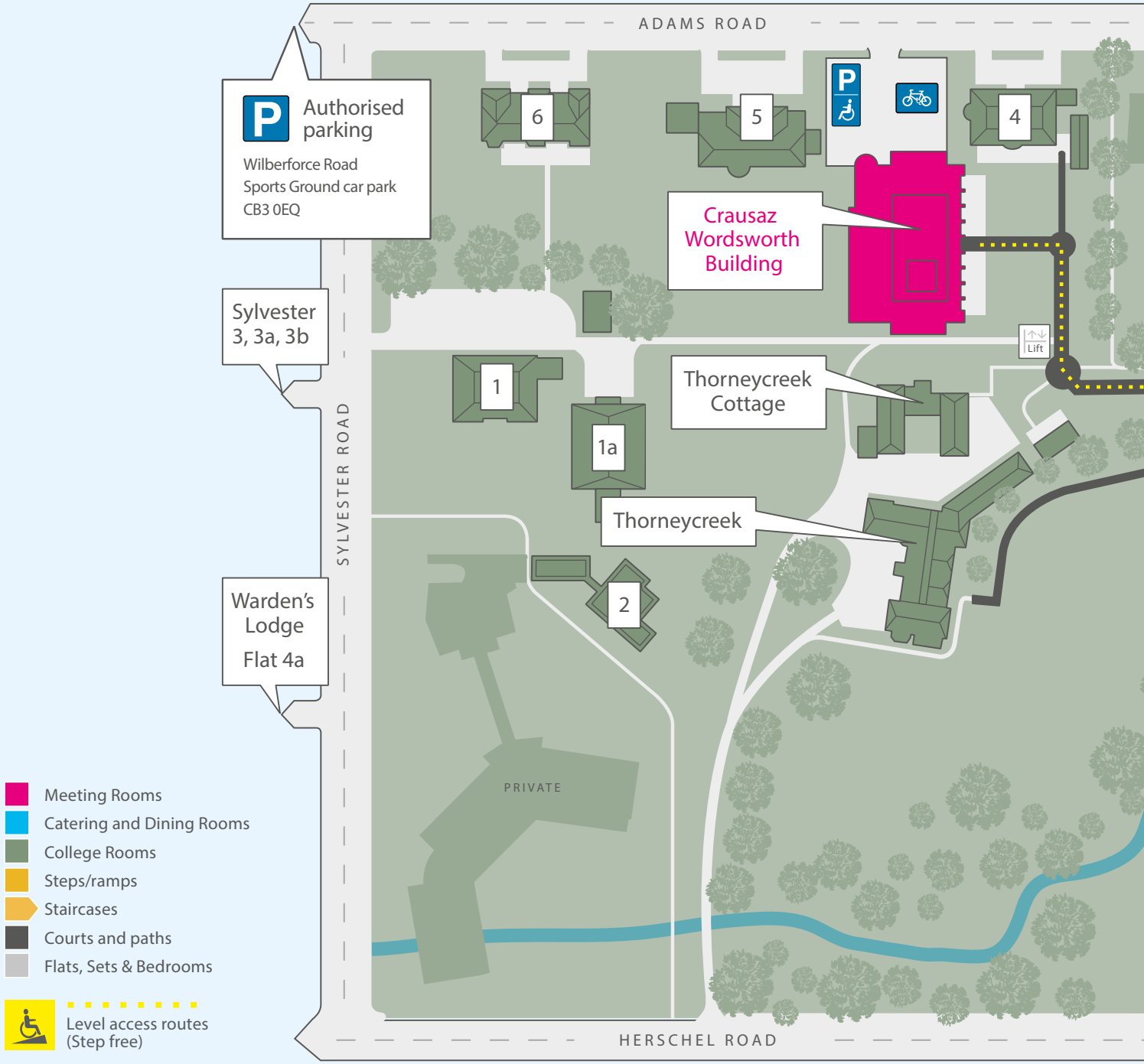
No trip to Cambridge is complete without a punting experience on the River Cam. There are a number of punt operators whose staff will attempt to persuade you onto their boat. The guided punt tours are entertaining, but the stories that the punters tell should be taken with a pinch of salt! It is worthwhile for the lovely perspective of Cambridge from the river, along the "backs" of some of the most famous Colleges.


UNIVERSITY OF
CAMBRIDGE

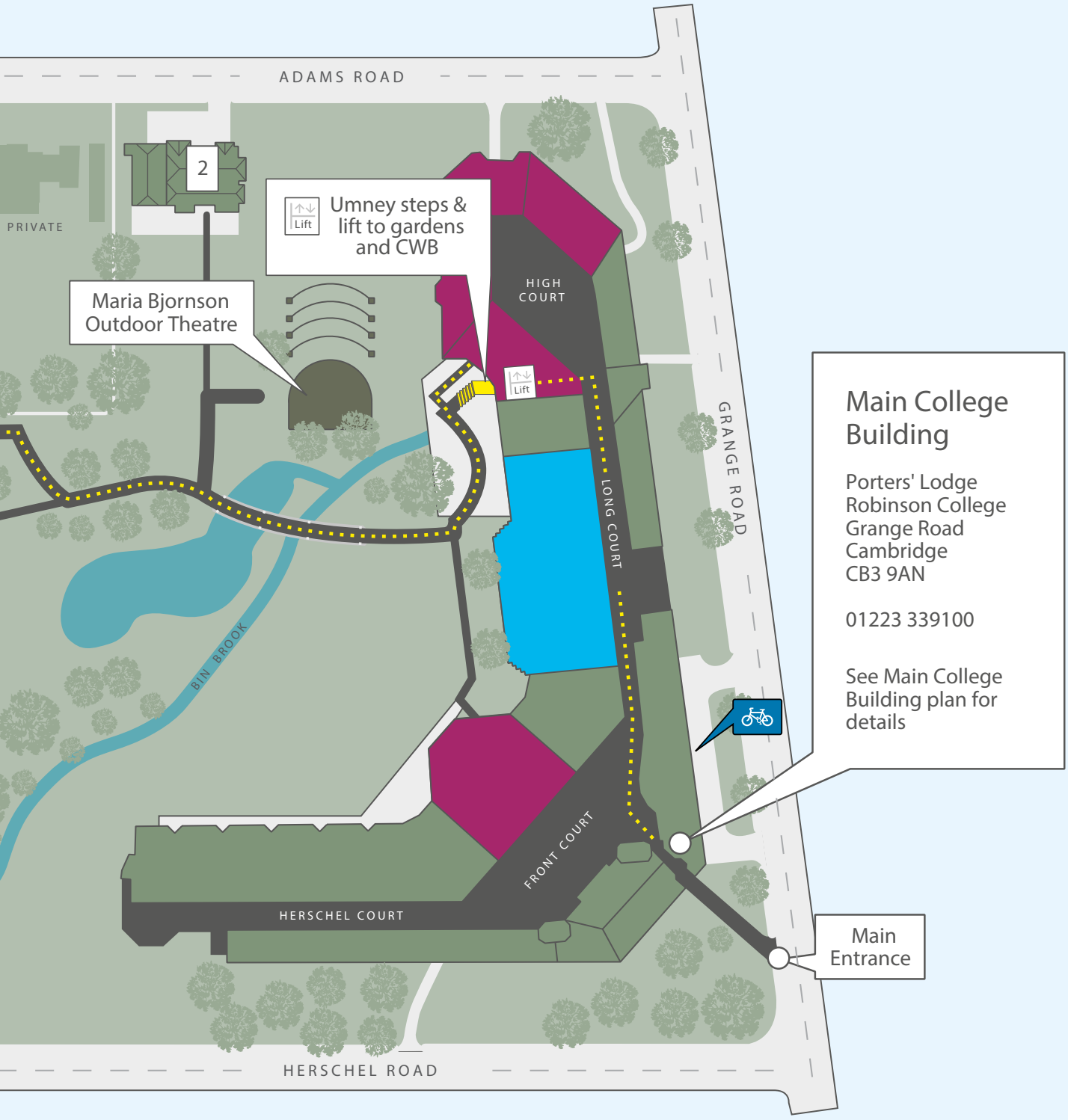
Location

How to find us:

All Summer School lectures will take place in the Crausaz Wordsworth building lecture theatre. Breakout sessions will be in rooms in the same building.



Robinson College
University of Cambridge



Institutions represented at the 2019 Summer School

We are delighted that our first International Summer School has attracted delegates from over 30 different institutions around the world. These include:

Amsterdam UMC, Netherlands

Anglia Ruskin University, Cambridge, UK

Cancer Research UK

Cancer Research UK - MedImmune Alliance Laboratory

Cancer Research UK Centre Southampton

Cancer Research UK Cambridge Institute

Cancer Research UK Cancer Prevention Trials Unit, King's College London

Cancer Research UK Oxford Centre

Heriot Watt University, UK

IHU Strasbourg, France

Imperial College London, UK

Karolinska Institutet, Stockholm, Sweden

Massachusetts Institute of Technology, USA

MRC Clinical Trials Unit at UCL, UK

National University Singapore

Oregon Health and Science University, USA

Pomeranian Medical University (PUM), Poland

Queen Mary University of London, UK

Queen's University Belfast

Stanford University, USA

University College London, UK

University of Birmingham, UK

University of Cambridge, UK

University of East Anglia, UK

University of Leicester, UK

University of Liverpool, UK

University of Nottingham, UK

University of Oxford, UK

University of Southampton, UK

Wales Cancer Network, UK

We would like to thank all our speakers, representing over 16 institutions, without whom the Summer School would not have run.

Arizona State University, USA

Bluestone Venture Partners, USA

Dalhousie University, Canada

Exact Sciences Corporation, USA

Immunovia AB, Sweden

Johns Hopkins University, USA

King's College London, UK

Michigan State University, USA

NSF International

Owlstone Medical, UK

Public Health England

Queen Mary University of London, UK

Radboud University, Netherlands

Stanford University, USA

University of Cambridge, UK

University of Warwick, UK

Notes

CANCER RESEARCH UK | CAMBRIDGE CENTRE

EARLY DETECTION PROGRAMME

College of Health Solutions
Arizona State University

We hope to see you at the 2019 Early Detection of Cancer Conference jointly organised by the Canary Center at Stanford, Cancer Research UK and the OHSU Knight Cancer Institute.

September 24-26, 2019 at the Frances C. Arrillaga Alumni Center, Stanford, California.
www.earlydetectionresearch.com

Share your experience on Twitter by using #EDxSchool2019

www.earlydetectioncambridge.org.uk

UNIVERSITY OF CAMBRIDGE

SUMMER SCHOOL
EARLY DETECTION OF CANCER