



CANCER
RESEARCH
UK

EDINBURGH
CENTRE

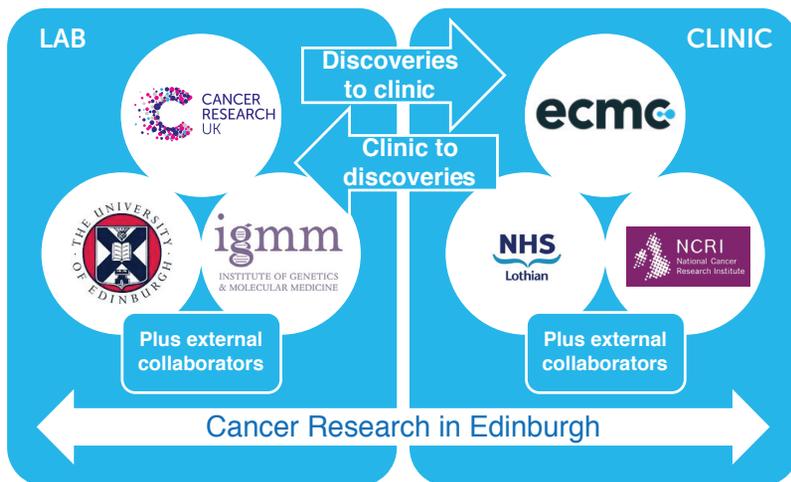
WE CHANGE LIVES AND SHAPE THE FUTURE



VISION AND STRATEGY

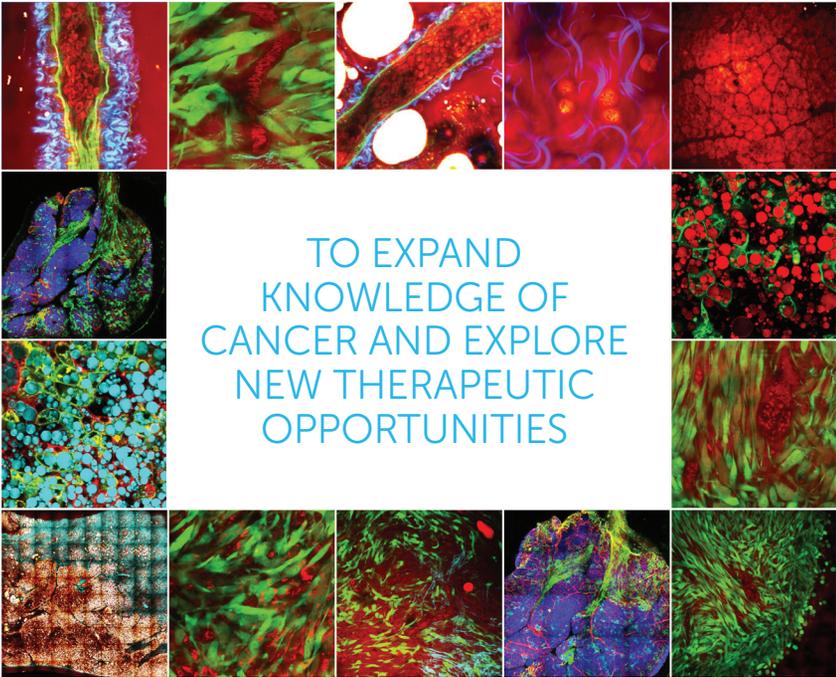
Cancer Research UK Edinburgh Centre (CRUK EC) is a comprehensive cancer centre with strong basic, translational and clinical cancer research programmes. The activities of the Centre scientists and clinicians span the full “bench-to-bedside” range, from mechanistic biological studies utilising in vitro models, animal models and primary samples (e.g. biopsies and human-derived organoid models); through medicinal chemistry, phenotypic drug discovery, advanced imaging and complex system biology/ computational biology approaches; to large-scale international clinical trials and post-trial data analyses. The overall aim of the Centre is to expand knowledge of cancer, and explore new therapeutic opportunities, by taking a multi-disciplinary approach that links lab and clinical wherever possible.

The Centre benefits from close integration of the Edinburgh Experimental Cancer Medicine Centre (ECMC) that has unique and world-leading expertise with early phase clinical research (including Phase I and II clinical trials), and proximity of the Western General Hospital where most of CRUK EC clinical activities take place.



To encourage inter-disciplinary research CRUK EC maintains close links with University of Edinburgh College of Science and Engineering (including Schools of Chemistry, Informatics, Engineering, Mathematics, Biological Sciences and Physics and Astronomy) and other research centres within College of Medicine and Veterinary Medicine.

The Cancer Research UK Edinburgh Centre strives to continuously improve its strengths in a broad range of research areas, with recent strategic emphasis on brain tumours and cancer informatics. In 2018 the Centre was named as a Brain Tumour Centre of Excellence in partnership with the University College London.



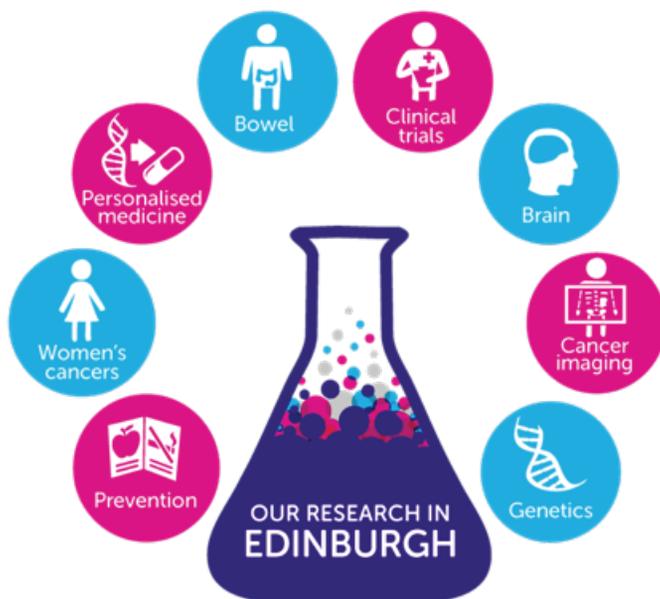
OUR AREAS OF EXPERTISE

The Centre's main research themes include:

- The state of the host: lifestyle, risk and prevention
- Stem cells and the cancer niche
- Signal transduction and biological mechanisms
- Phenomics Drug Discovery
- Cancer informatics and stratification for therapy

Clinical/translational emphasis:

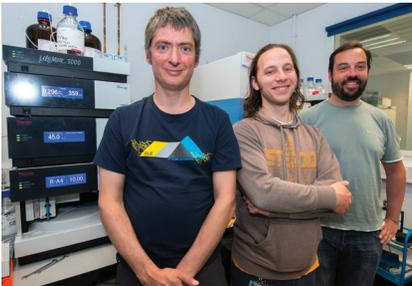
Our clinical/translational emphasis is largely in colorectal cancer, women's cancers (breast, ovarian and endometrial), and more recently in brain cancer. Research programmes in sarcoma, renal cancer and intrahepatic cholangiocarcinoma, a poorly researched cancer of unmet need, have also been recently initialized.



RESEARCH FACILITIES AND SERVICES

The laboratories in the Cancer Research UK Edinburgh Centre (CRUK EC) are equipped in state-of-the-art research tools and devices that complement ongoing research activities. Many of the Centre investigators have experience in providing consultancy and advice to industry, government agencies and other organisations. Our laboratories and facilities are open for new collaboration opportunities and joint research initiatives.

CRUK EC has access to a broad spectrum of high-end facilities within the University of Edinburgh and the MRC Institute of Genetics and Molecular Medicine. There are two dedicated CRUK EC based facilities - Host and Tumour Profiling Unit and Cancer Discovery Unit - that are highly experienced in contract research and provide timely, high quality services within University of Edinburgh and beyond, including industry partners.



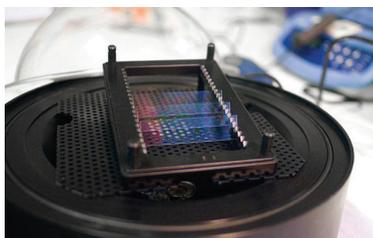
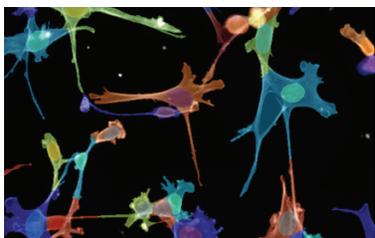
HOST AND TUMOUR PROFILING UNIT

The Host and Tumour Profiling Unit links pathology and molecular pathology research with systems biology approaches, including proteomics and metabolomics, to generate hypotheses for novel therapeutic strategies that can be tested in patients. The Unit collaborates very closely with the Centre clinical trialists assembled within the Experimental Cancer Medicines Centre (ECMC). The main technological platforms available within the Unit are: Reverse Phase Protein Arrays, Forward Phase Antibody Capture Arrays and nanoString system.

The Unit also hosts a dedicated mass spectrometry laboratory equipped with state-of-the-art instrumentation including two QExactive and one high-resolution Lumos mass spectrometer, coupled to nano-uHPLC pumps. In addition two robotic liquid-handling stations for reproducible sample preparation and clean-up are available. The mass spectrometry laboratory provides expertise, training, method development and services across a range of experimental approaches, including but not limited to expression proteomics, immunoprecipitation mass spectrometry (IP-MS), small-molecule assays and metabolic tracer analysis.

CANCER DISCOVERY UNIT

The Cancer Discovery Unit links basic science and chemical design strategies to predictive pre-clinical testing and clinical trials. It specialises in Phenomics Discovery, which integrates the latest advances in automated high throughput imaging with image informatics approach to enable high-throughput functional genomics and phenotypic drug discovery.



CLINICAL TRIALS

Rapid progression of better cancer therapeutics and improved clinical guidelines from the lab to the healthcare system represents an important priority of the Cancer Research UK Edinburgh Centre. The Centre has a history of bringing new treatments to the bedside, e.g. the first clinical trial of 5-HT₃ receptor antagonist (HT₃ receptor antagonists are very effective in controlling some side-effects produced by cancer chemotherapy) and important contributions to the pivotal clinical trial that led to global approval of Lapatinib in breast cancer therapy. Building on the past experience and expertise of the Centre's clinicians, the CRUK EC has a very active clinical trials programme with a broad range of sponsors (including industrial sponsors). The interests of the Centre investigators include every aspect of clinical trials, from trial design and patient recruitment to data collection, analysis and econometric evaluation of cost effectiveness of new treatments. Most of the early phase clinical trials are managed within a dedicated unit – the Edinburgh Experimental Cancer Medicines Centre, which constitutes a fully integrated part of CRUK EC.



AT ANY ONE TIME WE HAVE APPROXIMATELY
150 CLINICAL TRIALS OPEN FOR PATIENT
RECRUITMENT

Our clinical study priorities include:

- First in man and first in combination studies
- Early phase breast, ovarian, urology, and brain investigations
- Colorectal prevention intervention studies
- Biomarker development and clinical qualification
- Metastatic and earlier phase translational studies
- High-priority national network early phase studies

EXAMPLE CASE STUDIES

Research performed at the CRUK EC over the years has had a huge impact in the UK and globally, both for the patient and for our society as a whole. Our studies are too numerous to list them all, but here are two representative examples of our impactful research from the past years.



Evidence-Based Identification and Cost-Effective Treatment of Depression in Cancer Patients

Over 300,000 patients a year are diagnosed with cancer in the UK. As treatments become more effective there are increasing numbers of patients living after a diagnosis of cancer (estimates are around 2 million), many of whom are not cured but living with disease that requires active therapy. Symptoms of depression are known to be common in cancer patients and to affect quality of life as well as to have possible prognostic significance.

Researchers from our Centre with collaborators at Christie Hospital in Manchester and St Thomas' Hospital in London, were the first to prospectively assess the prevalence of major depression in a broad range of cancer patients, and then to develop an evidence-based intervention to manage these patients. Their research influenced a number of important policies, guidelines and professional recommendations including the UK National Institute for Health and Care Excellence (NICE) clinical practice guideline CG91 "Depression in adults with a chronic physical health problem" (2010); National Comprehensive Cancer Network (NCCN) clinical practice guidelines in oncology on distress management in the USA (version 2, 2013); "The management of depression in palliative care" – European clinical guidelines developed on behalf of the European Palliative Care Research Collaborative in 2010; "Psychosocial health care for cancer patients and their families: adaptation and internal and external review." – a quality initiative of the Cancer Care Ontario (Canada) (2010) and "Recommended for practice" section of the evidence-based practice guidelines and recommendations on depression management published

in 2008 by the US-based Oncology Nursing Society (ONS). The developed intervention scheme has contributed to improved quality of life of many cancer patients. Importantly, under the national UK Quality and Outcomes framework (part of the General Medical Services contract from the Department of Health, which was heavily influenced by the NICE guidelines), General Practitioners are strongly encouraged to perform a cancer care review, which includes assessment of patients' social support networks and emotional needs.



Detailed analysis of trial of lapatinib in combination with capecitabine in advanced, HER2+ breast cancer led to marketing authorisation worldwide

The chance of a woman having invasive breast cancer some time during her life is about one in eight. Around 12-15% of all breast cancers over-express the cell surface tyrosine kinase receptor human epidermal growth factor receptor 2 (HER2+). These patients have more aggressive disease than those who are HER2-negative, and a higher chance of developing incurable, life-threatening metastatic disease. The drug trastuzumab (Herceptin) is used to treat such cases, but in most patients, resistance develops and alternative therapies are needed. No such therapies were available before the development of lapatinib.

Professor David Cameron (Clinical Director of the CRUK EC) was joint chief-investigator on the global pivotal registration trial that led to the marketing authorisation of the drug lapatinib in combination with capecitabine.

The results of the phase III trial with lapatinib confirmed the clinical efficacy of a small molecular tyrosine kinase inhibitor in patients with HER2+ breast cancer for which trastuzumab was no longer effective. Lapatinib (commercialized as Tykerb/Tyverb) was the first agent to be approved for use in HER2+ breast cancer after trastuzumab. The drug was approved in over 100 countries and, in addition to helping thousands of patients with incurable metastatic HER2+ subtype breast cancer, it generated sales for the UK-based company (GSK) of £227M in 2010, £231M in 2011, £239M in 2012, £207M in 2013 and £171M in 2014.

ENGAGING OUR COMMUNITIES

At the Cancer Research UK Edinburgh Centre we understand the importance of giving the public opportunities to participate, inform and feedback on our research. Connecting researchers to patients, local communities and wider society is one of our highest priorities. CRUK EC is a hub of research engagement activities with a broad spectrum of events including laboratory tours, meetings with people affected by cancer, community festivals, Open Doors Days, pop-up stalls at the Western General Hospital and others. Our scientists actively reach out to local schools to provide real-world context for the Curriculum for Excellence and ignite an interest in science and medicine among young people. A range of lectures and seminars delivered by CRUK EC investigators are open to the public.

Our researchers are keen to inform UK and Scottish Government cancer policy and strategies. The CRUK EC presents to the Scottish Government on an annual basis and our doors are always open to policy makers, MPs and MSPs.



WORKING IN THE CENTRE

“Science means constantly walking a tightrope between blind faith and curiosity; between expertise and creativity; between bias and openness; between experience and epiphany; between ambition and passion; and between arrogance and conviction - in short, between an old today and a new tomorrow.”

Heinrich Rohrer: A Swiss scientist who won 1986 Nobel Prize in Physics (with Gerd Binnig and Ernst Ruska) for the design of the scanning tunneling microscope.

With generous support from Cancer Research UK and other funders, our primary objective is to perform excellent science at top international level. We aim to recruit the brightest minds from across a broad spectrum of diverse disciplines, train them to the highest possible standards using innovative approaches, and provide an environment in which they can thrive to become scientific and clinical leaders of tomorrow.



Led by experienced investigators with complementary skillsets (Professor Margaret Frame – Science Director and Professor David Cameron – Clinical Director) and closely integrated with the University of Edinburgh’s MRC Institute of Genetics & Molecular Medicine (IGMM) – one of the

largest biomedical research establishments in the UK with over 500 research and support staff – the Cancer Research UK Edinburgh Centre is a great place to pursue clinical or PhD training, to undertake a postdoctoral fellowship or to start an independent laboratory. The Centre’s location at the heart of Scotland’s capital city ensures a wide selection of available accommodations and reliable public transport network including an international airport. Edinburgh offers abundance of green areas and good quality of life. Situated between shores of the North Sea and picturesque hills of the Pentlands, it is a fantastic place for hiking, water sports and other leisure activities. It is also a major commercial and cultural hub with the world famous Edinburgh International Festival.

If you are passionate about science and searching for opportunities to advance your career in translational environment strongly focused on real life impact then consider joining us. We change lives and shape the future!

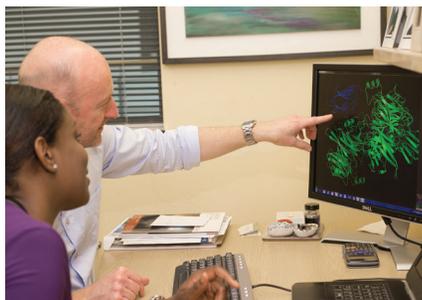
CLINICAL TRIALS



LABORATORY WORK



COMPUTING AND DATA ANALYSIS



EDUCATION AND TRAINING



KNOWLEDGE EXCHANGE



PATIENT AND PUBLIC ENGAGEMENT





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