ICR The Institute of Cancer Research

Licensing and collaboration opportunity

Predicting radiotherapy response in muscle-invasive bladder cancer using gene expression profiling

The Institute of Cancer Research, London, is seeking a partner to continue the development of a gene expression profiling method for predicting response to radiotherapy in muscle invasive bladder cancer (MIBC).

Key Features

- Development team are working to translate advances in the molecular characterisation of tumours into successful implementation of personalised cancer treatment in the clinic.
- Data indicates that this novel method can strongly distinguish between MIBC patients with a good or poor prognosis following radiotherapy.
- Gene expression signature has potential to be developed into a predictive biomarker to help guide treatment selection.
- These biomarkers were initially identified by applying machine learning and artificial intelligence (AI), with our tools and expertise available to make further refinements.

Intellectual property

The Institute for Cancer Research (ICR) has filed a PCT patent application (PCT/EP2021/070274) and is also pursuing a GB application (GB2011213.2) in parallel, covering the materials and methods for predicting response to radiotherapy among cancer patients, particularly those with MIBC.

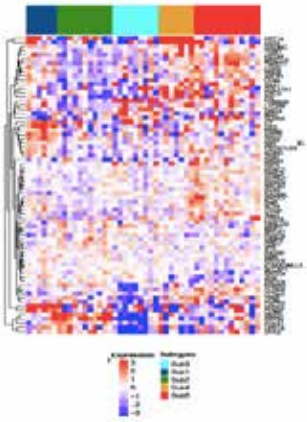
Commercial Opportunity

The ICR has full commercialisation rights to this method and is seeking a commercial partner to develop the method into a clinical assay for MIBC and to collaborate with on biomarker development for MIBC and biomarker-led clinical trials.

About the programme

The Institute of Cancer Research (ICR) carries out world-leading research into bladder cancer, including a historic clinical trial (BC2001) which changed how the condition is treated. We are developing new drugs and radiotherapy techniques to treat bladder cancer more effectively.

Muscle-invasive bladder cancer (MIBC) is aggressive and has a poor prognosis. Radical treatment options are currently cystectomy or bladder preservation with radiotherapy and a radiosensitiser e.g. chemotherapy. The decision between surgery or radiotherapy is based on patient factors and disease parameters. There is a real clinical need for predictive and prognostic biomarkers to guide treatment strategy for individual MIBC patients.



A heatmap showing the expression profiles of the 71 genes included in a classifier according to disclosure across samples in a radiotherapy +/– chemotherapy cohort.

ICR researchers have developed a novel method based on the gene expression profiling of tumour samples which aims to predict patient response to radiotherapy. Our initial studies indicate five different molecular subtypes; patients with subtypes 4 and 5 appear to be associated with better outcomes after radiotherapy compared to subtypes 1-3.

Radiotherapy research

The ICR is home to one of the world's leading radiotherapy research programmes. Our scientists are investigating new imaging methods to diagnose cancer, and ways to improve radiation treatment using advances in technology and molecular biology. They are also focused on developing ways to evaluate the response to treatment using cutting-edge techniques measuring aspects of tumour biology.

Alongside our hospital partner, The Royal Marsden NHS Foundation Trust, we have been pioneers in developing radiotherapy as a treatment for cancer since the beginning of the 20th century. Our research into targeting delivery of radiotherapy precisely to tumours has helped increase the effectiveness of radiation treatments, leading to changes in clinical practice, reduced treatment complications and improved cure rates.

The ICR is focused on taking research results to patients as quickly as possible. We work with pharmaceutical companies to develop new treatments for patients, and are the most successful university in the UK at generating invention income from our discoveries – income which we plough back into our research.

We are consistently ranked by international league tables as one of the world's most successful higher education institutions for academic innovation and effective collaboration with industry.

Key publication
James, N. D. et al. *Radiotherapy with or without Chemotherapy in Muscle-Invasive Bladder Cancer.* N Engl J Med 2012; 366:1477-1488.

Lead scientist

The method was developed by **Professor Robert Huddart**, Professor of Urological Cancer (*pictured*), **Dr Anguraj Sadanandam**, Team Leader in Systems and Precision Cancer Medicine Team, and **Dr Melissa Tan**, who worked on the project during her MD (Res) at the ICR.

Business & Innovation Office

The ICR's interactions with industry partners are led by our Business and Innovation Office which oversees a large portfolio of partnership and licensing opportunities across a range of oncology research.

Contact the Business and Innovation Office for more information on our licensing and partnering opportunities.

Read more about our commercialisation work and sign up for our industry email newsletter at icr.ac.uk/partnerships

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