

**MANCHESTER  
CANCER  
RESEARCH  
CENTRE**

# Annual Report

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**2022/2023**

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# At a Glance



# Executive Summary

Reflecting on 2022/2023, I envisage the phoenix rising from the ashes. We've seen the culmination of more than six year's work establishing the next phase of cancer research in Manchester. After a devastating fire, a global pandemic and the complex challenges they have led to, Manchester has emerged stronger and more determined than ever to drive innovative life-changing cancer research.

## A cancer research homecoming

After more than six years, the reopening of the Paterson Building represents the homecoming and culmination of work to recreate a single site for cancer research. With six floors of collaborative space for over 400 clinicians and administrative staff and 300 scientists, it is a valuable asset that brings the research and clinical communities together, helping us to create a future free from the burden of cancer.

Moreover, the new facility represents a significant opportunity for Manchester. For over six years Team Science has been geographically limited due to the majority of our research staff relocated to Alderley Park. Now, with their homecoming to the Paterson Building,

we have a major opportunity to leverage the only CRUK core-funded research institute that is located within a world-leading cancer hospital.

It is these opportunities that truly excite me for the future. The Paterson Building represents a tremendous opportunity, filled with state-of-the-art facilities and enough room to see the expansion of our research into many different and exciting research fields including immune-oncology, cancer biomarkers and disease specific cancer progression. The ability to translate discoveries directly into clinics at The Christie by working closely with clinicians provides a paramount opportunity to deliver new trials and hope for people with cancer.

## Research accolades

The MCRC drives novel research in the clinic and laboratory, and 2022/2023 has been no different.

These years have seen the securing of multiple centres of excellence including the NIHR Manchester Biomedical Research Centre (BRC) and Clinical Research Facility (CRF), as well as the CRUK Manchester Centre. These new awards have led to the initiation of innovative research projects which we hope will lead to new discoveries, trials, treatments and ultimately better outcomes for patients with cancer.

## Specific exemplars from 2022/2023 include:

- The DETERMINE Trial led by Dr Matt Krebs, which is looking to re-purpose existing drugs for use in adult or paediatric rare cancers;
- The RAPID-RT study led by Prof. Corinne Faivre-Finn and Dr Gareth Price to investigate the outcomes following changes to clinical guidance for lung cancer radiotherapy to implement a dose limit to the heart;
- TARGET National, which has opened for recruitment and takes the successful delivery of the TARGET trial nationwide to match patients to clinical trials based on their cancer genomics

## The future

We have witnessed our research portfolio grow over these past years with the appointment of many senior and junior group leaders. One such example is in neuro-oncology, which is now spearheaded by Prof. Petra Hamerlik, the Brain Tumour Charity Chair of Translational Neuro-Oncology at The University of Manchester. Professor Hamerlik is working to implement a strategy for brain tumour research alongside Dr Gerben Borst, who joined in 2020 (see POBIG exemplar spotlight on page 21).

We're also encouraged by the future investment in the developing future group leaders across Manchester following the appointment of Dr Sankari Nagarajan, Dr John Knight, Dr Evangelos Giampazolias, Dr Isabel Pires, and Dr Simona Valletta who are all sited within The University of Manchester or Cancer Research UK Manchester Institute.

Looking ahead to the next year at the MCRC, I'm excited by the opportunities our new campus presents. The combined strengths of the MCRC partnership as well as the new cutting edge facilities available offers a tremendous opportunity for expansion with space for more researchers. As our researchers continue to move into our new facility, it is an exciting time to see what collaborations can be realised now that our geographical barriers have been removed.

**Professor Robert Bristow**  
Director, MCRC and Cancer Research UK Manchester Centre



# A New Ecosystem for Cancer Research

## Paterson Redevelopment Project

### A new era of cancer research in Manchester

Following a devastating fire in 2017, the development of a new cancer research centre on the site of the former Paterson Building represents a unique opportunity to create a world-leading facility, right in the heart of Manchester. This new facility will help to support and integrate our discovery and translational research and transform patient outcomes through advances in the prevention, early detection and treatment of cancer.

With construction over, laboratory groups have now moved in and our vision of co-locating laboratory and clinical researchers with operational staff has been realised. We are now able to reflect on the tenacity of our partners to drive this building to fruition and look ahead to the future of cancer research in Manchester at our world-class cancer research campus.

### Six Years in the Making

Friday 31st March 2023 was a significant milestone in the Paterson rebuild, marking the signing over of the building from Integrated Health Projects (IHP) to The Christie and subsequent agreement of lease arrangements between the University and The Christie.



It was a truly momentous day, and this building has been nearly six years in the making. It has been an incredible journey, and at times quite emotional, with lots of challenges. However, these roadblocks have been overcome, maintaining our timetable and budget, and that really is remarkable. This building looks and feels fantastic both inside and outside – the way that it has been designed to promote interaction and synergy and the fact that this has been built by a partnership between The Christie, The University of Manchester and Cancer Research UK is something to be extremely proud of.

### Aims of the new build

The strength of Manchester is its partnership, which facilitates the bridge between discovery research and clinical research. The fact that this build is adjacent to The Christie, the largest

single-site cancer centre in Europe, ensures that research is translated into the clinic and vice versa.

The Paterson Building is a key ingredient for progressive cancer research and this build now provides exciting opportunities to cluster research activities across the cancer campus here in Withington. The groupings of research teams have been thought out, bringing groups that were previously quite disparate into neighbouring research areas. It also houses the new Cancer Biomarker Centre strengthening our ability to identify, quantify and validate cancer biomarkers. Combined, these new facilities drive our ambition for significant growth in research activities over the next five years.

The build will also provide important future-proofing space that will accommodate significant growth opportunities. It is envisaged that the

new facilities, as well as the ethos that underpins its design and use, will be a great asset for future recruitment. The research leaders, including a new Director of the CRUK Manchester Institute, will be developing the strategy for this recruitment drive, focusing on building strength in key priority areas where Manchester can really excel.

### Why Manchester

Why Manchester is best suited for this build comes entirely down to the power of the MCRC partnership. Over the preceding 15 years, we have worked towards establishing a partnership that has a unified research vision and ambition and which coordinates and co-invests in people and infrastructure to deliver this vision. Crucially, the partnership brings together research across the spectrum from basic discovery science right through to the clinic.

## Paterson Building key facts

This research building will house one of the **largest number of scientists, doctors and nurses in Europe**

20% cement replacement material was used, resulting in **significant CO<sub>2</sub> savings**

**10,000m<sup>3</sup>** of concrete has been used; enough to fill four Olympic sized swimming pools

**16,000m<sup>3</sup>** of materials have been recycled from the basement evacuation

The building height from the basement to the rooftop is **54.2 metres;** equivalent to 12 double decker buses

Perhaps the clearest demonstration of the success and tenacity of this partnership is the new build. The vision crystallised within weeks of the devastating fire and the vast majority of the funding has come from the three partners. If that isn't a demonstration of commitment to the partnership, then I don't know what is.



*I think it's sometimes easy to forget the journey we've been on. But actually, it's been quite a remarkable journey which began with the tragic fire and which progressed through thick and thin to see the building rise out of the ashes. To reach this stage of completion is a real success story and is due to the fantastic strength of the partnership we have here.*

*At the end of the day, as magnificent as it is, it is a building. It's the research that goes on inside this building that is key, especially with the emphasis on Team Science and synergy. This is not only an exciting development for people already in Manchester, but for those that it will attract and recruit.*

**Professor Nic Jones, Director of Strategic Initiatives, MCRC**



# Funding Manchester Successes

2022/2023 has seen the successful renewal of several core infrastructure builds across Manchester. This has provided strongholds to implement strategic research across multiple research themes, most notably in the development of experimental cancer medicines.

## Funding boost to help develop new cancer treatments

In January 2023, the Manchester Experimental Cancer Medicine Centre (ECMC) was awarded £3 million to help develop cancer treatments of the future. The funding boost, made possible by a partnership between Cancer Research UK and the National Institute for Health and Care Research, will be used over the next five years to advance innovative new treatments, including immunotherapies, improve existing treatments, and offer more patients access to clinical trials.

Manchester is part of a network of 17 adult ECMCs and one of 12 paediatric ECMCs across the UK, which deliver clinical trials of promising new treatments. Since 2007, when the network was first established, around 30,000 patients have taken part in 2,100 clinical trials.

## Largest ever research funding award to improve patients' lives in Greater Manchester

The National Institute for Health and Care Research (NIHR) Manchester Biomedical Research Centre (BRC) has received more than £60 million – the largest single research award given by the NIHR to the city region – to translate its scientific discoveries into new treatments, diagnostic tests, and medical technologies to improve patients' lives in Greater Manchester, Lancashire and South Cumbria, over the next five years.

The Manchester BRC is one of 20 NIHR funded Biomedical Research Centres across England, and the largest outside of the South East, and brings together world-leading academic clinical researchers. The new funding will allow for new research and treatments, improving the health, wealth, and wellbeing of the 2.8 million people living in Greater Manchester.

Four of the Manchester BRC's 13 themes focus on pioneering cancer research including: Prevention and Early Detection, Precision Medicine, Advanced Radiotherapy and Living With and Beyond Cancer.

**NIHR** | Manchester Biomedical Research Centre



**NIHR** | Manchester Clinical Research Facility



## Major investment in early-stage clinical research

A broader range of people in Greater Manchester will now be able to take part in early phase clinical research, thanks to a £15.5 million award made to the National Institute for Health and Care Research (NIHR) Manchester Clinical Research Facility (CRF), creating the largest and most comprehensive NIHR CRF in the UK.

This award supports the Manchester CRF to be a world-class exemplar of an integrated CRF that enhances translation of scientific advances arising through experimental medicine studies and promotes research participation for patients of all ages and backgrounds across GM. The investment expands provision from four to six CRF units improving access to experimental medicine studies for underserved communities in the North and West of the region. Working

alongside the NIHR Manchester BRC, this new funding will allow Manchester CRF to expand in response to the needs of Greater Manchester's population and reach diverse communities across the region, as part of an aim to reduce health inequalities.

The NIHR Manchester Clinical Research Facility at The Christie provides the specialist infrastructure needed to support researchers in the delivery of world class oncology research. A variety of clinical research is supported by the Manchester CRF at The Christie, from Phase 1 first-in-human trials to innovative advanced therapy studies, as well as complex later phase research.

## CRUK Manchester Centre funding extended for a further five years

The renewal of the Cancer Research UK Manchester Centre supports the necessity to bridge the gap between clinical and laboratory research. With further funding until 2027, Manchester joins a network of seven other CRUK Centres across the UK, including Cambridge, Oxford, City of London, Convergence Science, Newcastle and Scotland. It is designed to translate lab-based discoveries to the clinic to improve treatment and care for people with cancer.

The funding renewal will allow the CRUK Manchester Centre to continue to drive translational science across five cross-cutting research themes: Cancer Biomarkers, Cancer Early Detection, Experimental Cancer Medicine, Integrative Pathology, and Radiotherapy BioAdaption.

For more information about the CRUK Manchester Centre see page 24.

# Research Spotlights

Cancer research in Manchester is impactful, innovative and world-leading. The following four examples demonstrate how the Manchester ecosystem enables new clinical trial discoveries, builds on our understanding of basic science and explore new laboratory groups.



## TARGET National

**958** patients already enrolled of a planned **6,000**

**15** UK sites

### Leading national precision medicine trials

Precision medicine is aimed at selecting the right drug for the right patient at the right time. A patient's response rates to novel therapies can be increased by matching said patient to an appropriate molecularly targeted therapy based on genomic alterations. This information is provided through liquid-based genomic testing, however there is currently no routine access to this available on the NHS.

The original TARGET study, funded by MCRC, demonstrated the feasibility of matching patients to early phase clinical trials based on analysis of their circulating tumour DNA (ctDNA), found in liquid biopsies. TARGET National expands on this programme to offer ctDNA testing across 20 UK Experimental Cancer Medicine Centres. Aiming to recruit up to 6,000 patients over the next five years, the study is funded by The Christie Charity and the Sir Bobby Robson foundation with sample kits provided by Roche Foundation Medicine.

Blood samples are collected from patients with advanced solid cancer and ctDNA testing is performed within two weeks of their enrolment. These patients are then discussed within a National Molecular Tumour Board (MTB) which enables them to match patients to experimental therapy trials across the UK.

The study allows patients access to state-of-the-art liquid based genomic profiling, thereby enhancing the number of patients matched to early phase clinical trials.

## rEECur Trial

### Patients with recurrent and primary refractory Ewing sarcoma

Ewing sarcoma is a rare type of cancer that affects the bones or surrounding soft tissue and is the second most common type of bone cancer in children and young adults, with about 60 children and young people diagnosed in the UK every year.

One clinical trial aiming to identify the best treatments for Ewing sarcoma is the rEECur trial led by Dr Martin McCabe at The University of Manchester and The Christie NHS Foundation Trust. The trial is funded by Cancer Research UK and aims to improve the outcomes for patients diagnosed with relapsed and refractory Ewing sarcoma through the addition of a targeted drug to their chemotherapy treatment.

The results of the rEECur trial, presented at American Society of Clinical Oncology (ASCO) Annual Meeting 2022, demonstrated that high dose ifosfamide is the most effective chemotherapy treatment currently offered to patients. The trial compared different chemotherapies to identify which treatment was the most effective or most toxic by accruing randomised data for four widely used chemotherapy regimens.

Following the comparison of four chemotherapy regimens that identified high dose ifosfamide as the most effective chemotherapy treatment currently offered to patients, a fifth and sixth regimen is now being investigated. The most recently added regimen is testing whether lenvatinib, an MTKI (a class of targeted drugs that are active against relapsed Ewing sarcoma tumours when given alone) given with chemotherapy, is more effective than chemotherapy alone.

The Bone Cancer Research Trust has awarded a further £210,000 to support three biological studies embedded within the trial, focusing particularly on the Lenvatinib regimen. Through identifying the patients who are most likely to respond to lenvatinib, it should act to offer more targeted treatments and minimise patient side-effects. Additionally, the trial also has the potential to identify patients who are likely to experience relapse at the point of diagnosis, and so, better plan their treatment. These three additional studies will also look at how the drug moves around the body, indicators of response to treatment and indicators of relapse.

By analysing patient samples collaboratively with other participating countries, this trial will act to bring together specialist expertise from Europe to develop more effective treatments and so improve outcomes for Ewing sarcoma patients.



## Establishing the Leukaemia, Immunology and Transplantation Laboratory



### Dr Mark Williams

Mark's interest in haematology began at medical school where he first encountered patients undergoing stem cell transplantation, a form of radical cellular immunotherapy. After moving to Manchester, Mark met Prof. Tim Somerville and undertook a Clinical Research Training Fellowship in the CRUK Manchester Institute's Leukaemia Biology Laboratory. His work focused on understanding chemotherapy resistance in acute myeloid leukaemia (AML) and was supported by the Kay Kendall Leukaemia Fund and CRUK.

Following the completion of his PhD, Mark was awarded a University of Manchester Presidential Fellowship with the aim of developing an independent programme of transplant research. In 2022, he was awarded an MRC Clinician Scientist Fellowship, which is now supporting the establishment of the Leukaemia, Immunology and Transplantation Laboratory.

His newly formed group pursues several strands of research, aiming to develop and implement a comprehensive strategy to prevent post-transplant leukaemia relapse. His team are developing novel biomarkers to identify patients at risk of relapse, defining the critical drivers of T-cell dysfunction and exploring the potential of inducing leukaemic differentiation to augment donor T-cell responses. These studies will enable early detection of those at risk of relapse, allowing stem cell transplantation to be tailored towards individual patients.

One of Mark's major achievements was through an MCRC-driven Town Hall initiative led by Prof. Rob Bristow in 2018. These projects were intended to be cross-cutting and collaborative, and Mark was successful in developing a study called Precision Medicine in Stem Cell Transplantation (PM-SCT), bringing together Manchester's three transplant centres: The Christie, Royal Manchester Children's Hospital and Manchester Royal Infirmary.

PM-SCT aims to recruit 300 patients over the next two years, acquiring blood samples and comprehensive clinical data. The study will create a large sample repository of plasma and viable mononuclear cells, enabling a programme of biomarker research that aims to predict life-threatening complications following stem cell transplantation.

*"One of the advantages and privileges of being a clinician scientist is that I meet patients every week undergoing the treatments that I study. This provides me with tremendous motivation and real-world insight as to how scientific advances can be applied to improve outcomes"*

## DETERMINE: Determining Extended Therapeutic indications for Existing drugs

**A multi-drug, precision medicine trial for adults, teenagers, and children with rare cancers**

DETERMINE, a clinical trial project led by Dr Matthew Krebs from The University of Manchester, in partnership with Roche and Novartis, is the first UK national precision medicine trial in rare cancers. This trial is one of the largest precision medicine trials targeting these patients and enrolls patients with an identifiable genomic alteration in their tumours.

The trial, which is currently open to recruitment at multiple sites across the UK, is aiming to recruit adults, teenagers and children who have a rare genetic change in their cancer and have run out of treatment options. It aims to find out whether existing 'licensed' drugs that have been approved for use in some cancer types can also target identifiable genomic alterations in other types of cancer.

The unique design of this trial means that promising cohorts will be submitted to the Cancer Drugs Fund, who together with the NHS Clinical Policy team, will decide whether a period of data collection is necessary to consider the drug as a routine treatment on the NHS. This trial could

therefore provide new treatments for patients who may only have limited options left, with the medicines being used in this trial being targeted at specific genomic faults.

Sponsored by CRUK's Centre for Drug Development, this trial is run in collaboration with The Christie NHS Foundation Trust, the University of Birmingham, and The Royal Marsden NHS Foundation trust. The trial, which opened in early summer 2022, is scheduled to run for five years.

Most recently in April 2023, the team was awarded the Bionow Healthcare Project of the Year award in recognition of the innovative platform trial.



# Early Phase Clinical Research

Clinical research is a pivotal moment in the deployment of any cancer research innovation, defining the evaluation of treatments, technology or methods involving people.

In Manchester, our rich heritage of clinical research is enabled by an impressive portfolio of over 800 clinical studies (observational and trials) that involve over 3,500 patients every year.

Amongst the many strengths in Manchester is our early phase clinical research with over 130 Phase I trials

currently active in Manchester helping deliver novel experimental cancer medicines to approximately 300 patients a year. Supporting these teams is an impressive portfolio of infrastructure through the Clinical Research Facilities at The Christie, including the Experimental Cancer Medicine Centre.

## CASE STUDY Digital innovation for patient benefit – The A-EYE Study

Novel cancer therapies often have unknown toxicity profiles that can include changes to the eye. Many clinical trials now require regular ophthalmology assessments with ongoing expert opinion, which may extend beyond the trial and place an increased burden on the ophthalmology service. As these novel agents progress into later phase trials and have approved usage, the burden on ophthalmology services will further increase.

The University of Manchester sponsored A-EYE study aims to

develop new AI methods to detect retinal abnormalities associated with cancer treatment and assess against ophthalmologists' decisions. This is a mixed quantitative and qualitative study to develop and evaluate the application of Artificial Intelligence (AI) methods using retinal imaging for the identification of adverse retinal changes associated with cancer therapies.

This ophthalmology project was initiated to try and address these resourcing issues which can leave cancer patients, particularly those on early-phase cancer clinical trials, requiring specialist eye treatment and support.

A-EYE opened to recruitment at the Manchester Royal Eye Hospital in June 2021, led by Professor Tariq

Aslam as the Chief Investigator. By November 2022, data collection from all 350 patients recruited to the study had been completed. The data collected from the patients includes their anonymised eye scan alongside relevant clinical data and knowledge.

The digital ECMT AI team are using these to develop and test an ethical and explainable algorithm to detect eye toxicities from eye scans. The study has expanded to a further 20 consultant specialist ophthalmologists, who will be interviewed to discuss the acceptability of the AI algorithm in clinical practice once it has been developed and tested. Additionally, a further 100 patients have completed a questionnaire on the use of AI in their care.

## CASE STUDY Looking at Referral Routes for Sarcoma Patients into Cell Therapy Clinical Trials

Advanced therapies focus on restoring and restructuring diseased or damaged tissue and organs and can be both challenging and complex in nature. Cell Therapy - the transplantation of human cells to replace or repair damaged tissues and/or cells - is a type of advanced therapy used to treat several diseases including sarcoma.

Cell Therapy trials show exciting results but patient benefit is limited by specific tumour marker

requirements and the complex patient pathway from start to finish with few hospitals having the facilities to deliver them.

This study used an online, UK-wide survey of sarcoma doctors to identify any gaps in the routes used to highlight and consider patients who may be eligible for particular cell therapy treatments or clinical trials available. Its aim was to maximise patient access to cell therapy clinical trials available in the UK.

The survey highlighted that while sarcoma doctors have good knowledge of cell therapy trials, there are several gaps amongst responders and their colleagues. This identified the need to improve the cell therapy referrals process across the sarcoma network of healthcare providers. A template

referral form is currently being developed and will be released via the Advanced Therapy Treatment Centre (ATTC) network.

This work has helped engagement with the wider sarcoma referral network. The findings were presented at a virtual event 'Emerging Advanced Therapies in Soft Tissue Sarcoma' in September 2022 (hosted by The Christie NHS Foundation Trust and iMATCH and funded by Sarcoma UK). This project has also been presented as a poster presentation at the British Sarcoma Group 2023 conference.

This work was coordinated by The Christie (through the iMATCH Programme) and was supported by funding from GlaxoSmithKline (GSK).

## The experimental cancer medicine centre

The Manchester ECMC, co-chaired by Professor Caroline Dive and Dr Natalie Cook, leads in the discovery, development and testing of new adult and paediatric precision medicine cancer treatments. Its work integrates the complex genomics and evolution of cancers and how these factors influence the way in which a patient responds to treatments. This is done through a concentration on molecular profiling, biobanking, imaging, biomarker discovery and radiotherapy research.

Funded by CRUK and NIHR, the Manchester ECMC benefits from its involvement in the network of centres within the UK which accelerate innovation and early-phase clinical trials.

Manchester ECMC is also part of 'ECMC North', a network of Glasgow, Edinburgh, Belfast, Newcastle, Liverpool and Manchester ECMCs as well as Sheffield and Leeds clinical trial facilities, dedicated to providing patients with better access to the most comprehensive range of experimental cancer medicine trials possible.

The ECMC supports a Team Science approach to research, involving multiple specialisms including medical oncologists, research nurses, data managers, clinical trial coordinators, research practitioners, pharmacists, research nurses, medical secretaries and Translational Research facilitators to deliver these complex early-phase clinical trials.

Emphasising the need to remain at the forefront of revolutionary cancer research and care, the ECMC focuses on four future research themes:

- Lead national precision medicine trials
- Drive digital innovation for patient benefit
- Deliver challenging advanced cell therapy studies
- Ensure equality of access to trials

Over  
**130**  
Phase 1 trials  
currently  
active

**300**  
patients receiving  
experimental  
therapies  
per year

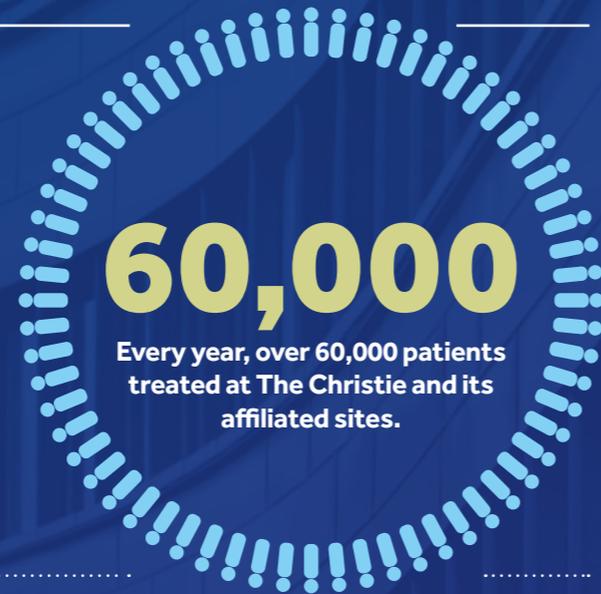
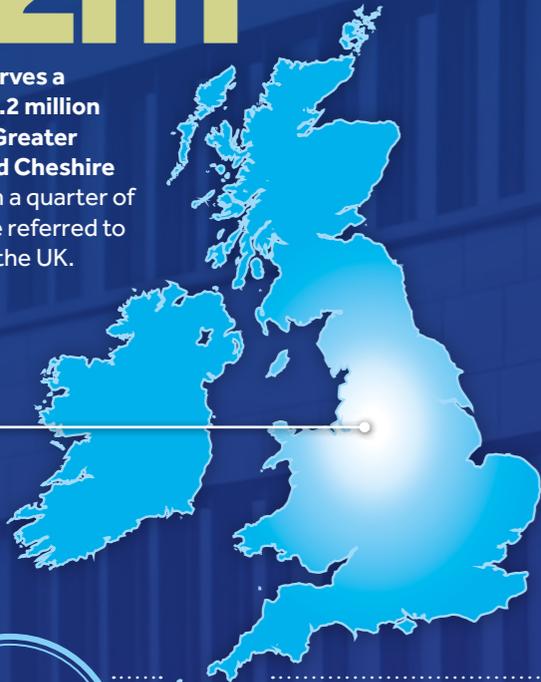
# The Christie



The Christie is a world leading specialist cancer treatment centre and is the largest single site cancer centre in Europe.

# 3.2m

The Christie serves a population of 3.2 million people across Greater Manchester and Cheshire while more than a quarter of our patients are referred to us from across the UK.



# 97,000

Over 97,000 chemotherapy treatments delivered to patients.

One of nine UK Centres to offer advanced CAR-T therapies.

Mobile chemotherapy unit provides treatment options at locations across Manchester closer to patients' homes.



# 87,000

Extensive radiotherapy facilities providing over 87,000 treatments in fields including: MR-Linac, Proton Beam Therapy, FLASH radiotherapy, SABR, Adaptive Radiotherapy.



# 800

Over 800 clinical studies active during 2022/2023, including open and follow-up studies and clinical trials.



# 3,500

3,500 patients involved in Christie research projects in 2022/23.

The Christie was the first UK member audited and accredited as a Comprehensive Cancer Centre by the Organisation of European Cancer Institutes; meeting quality standards in care, education and research.

# 1<sup>st</sup>

The Christie has been named as one of the inaugural European Prostate Cancer Centres of Excellence. The specialist cancer centre in Manchester is the only facility in the UK to be given the accreditation.



# Top 100

The Christie has been named one of the 100 best specialist hospitals in the world by Newsweek magazine – one of the highest profile publications in the USA, sharing this accolade with a small group of the world's elite specialist hospitals.



The Christie has been named as the most Technologically advanced hospital outside of North America.

The Christie works with national and international industry organisations including: Roche, AstraZeneca, Bristol-Myers Squibb, Novartis, GlaxoSmithKline and Celgene.

We also work with clinical research organisations Pharmaceutical Product Development (PPD), IQVIA and Paraxel.



# Manchester University NHS Foundation Trust (MFT) Cancer Research In Numbers



MFT manages ten hospital sites and delivers community services in Manchester and Trafford



The ten hospitals are responsible for providing local hospital services to these populations which total approximately

**776,000 people**

as well as providing specialist services to the North West and UK populations.



MFT receives around **36,000 cancer referrals** which result in approx

**6,500 diagnoses** per year



Our Oxford Road Campus hosts QIAGEN's European Centre of Excellence for Precision Medicine at Citylabs 2.0, a world-class genomics campus for diagnostics and health innovation.



MFT is one of the biggest employers locally, with approximately

**28,000 staff**

and an annual turnover of more than



**£2 billion**

## Treatment and Clinical Research



MFT is one of the biggest paediatric cancer centres in the country, as well as the lead for the national Paediatric Experimental Cancer Medicine Centres.

**1<sup>st</sup>**

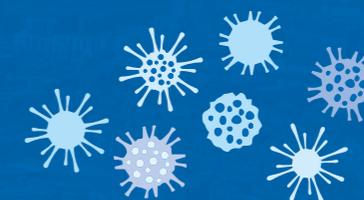
MFT was the first centre in the UK to be commissioned for CAR-T and now hosts two of Manchester's three CAR-T centres in RMCH and MRI.



MFT surgical teams deliver approx **5,000 operations** for patients with cancer each year



Manchester is one of the largest stem cell transplant centres in the world for metabolic disorders, and has contributed to improved international results and is contributing to advances in the field including in stem cell gene therapy.



MFT active research portfolios are in thoracic, breast, adult haematology, paediatric, gynaecology, HPB, colorectal, urological oncology, and head and neck.

## Early Detection



MFT provides a range of screening services including the GM Breast Screening Programme, one of the largest breast screening services in England, seeing **65,000 women** every year.



### Lung Health Check Spotlight

The community-based pilot completed in 2016 detected one lung cancer for every 23 CT scans performed, with almost 80% being early stage. Since 2019, over 43,000 people from North Manchester and Tameside have been invited to a lung health check and over 10,000 have been completed.



Approximately **150 cancer related trials** currently open to recruitment, many of which are early phase trials. On average MFT recruits approximately **5,500 patients** to studies that have a focus on cancer per year.

## Awards



The MFT team leading the Lynch syndrome screening for endometrial cancer project were highly commended in the **BMJ Cancer Care team of the year award 2021**

MFT Endometrial Cancer Research Group won NCRI Cancer Research **Excellence in Surgical Trials (CREST) Award 2019**

# Cancer Research UK RadNet Manchester

## Mechanisms and Models to Machines

Core to radiotherapy research in Manchester is Cancer Research UK RadNet Manchester, a research unit in collaboration with The Christie and part of CRUK's wider radiotherapy research network. 2022/2023 has seen RadNet Manchester progress understanding of radiotherapy on multiple fronts with innovative research, novel clinical trials, and strategic recruitment.

### Cutting edge radiotherapy research

Underpinning RadNet Manchester are three themes investigating the links between clinical and experimental research. Research focuses on immunological responses in patient tumours; using data mining for clinical insight into toxicity and comorbidity treatment interactions; and complex interactions in the tumour microenvironment.

Specific research spotlights from the past 12 months include: Dr Eliana Vasquez Osorio and team who have used data-mining methods to identify that delivering radiotherapy doses to the lower brainstem is associated with a swallowing

dysfunction. This data will be verified with collaborators and the team are planning further studies to demonstrate feasibility of sparing the region.

Work by Professors Robert Bristow and David Wedge has combined spatial transcriptomics and clonal evolution mapped tumours in oxic and hypoxic areas in cases of prostate cancer. It is hoped that this work will help inform new targets for combining anti-metastatic agents with local or directed radiotherapy and identify patients with aggressive disease for clinical trials.

Dr Marilena Hadjidemetriou continues to link nano-omics with radiotherapy. By analysing 300 clinical samples, the team were able to identify significant changes in the plasma proteome and commonalities between abundant proteins. It is hoped that through this analysis, potential biomarkers for clinical validation will be identified and mechanistic insight into radiotherapy effects gained.

Supporting RadNet Manchester's research themes are four cross-disciplinary hubs. These hubs help develop infrastructure and encouraging collaborative strategically important research in proton biology, clinical informatics, translational and early phase studies, and develop the next generation of advanced radiotherapy Allied Health Professional researchers.

These hubs support many aspects of RadNet and the wider Radiation Network and link to the other centres of excellence across Manchester. For example, the Early Phase Radiotherapy hub supports the development set-up and delivery of BIO-CHECC, CRAIN, POBIG, RO-PIP, TARDIS and TORPEdO trials while linking to the Experimental Cancer Medicine Team.

### Core recruitment

Bringing expertise in neuro-oncology, in September 2022, Prof. Petra Hamerlik joined the team and alongside Dr Gerben Borst who joined Manchester in 2020. Leveraging facilities at Northern Care Alliance and the Geoffrey Jefferson Brain Research Centre, Petra and Gerben aim to build capacity in neuro-oncology and position the MCRC and RadNet Manchester at the forefront of brain tumour research with programmes of clinical and pre-clinical research.

Also joining the RadNet team in March 2023 was Dr Isabel Pires. Her work focuses on investigating novel hypoxia-regulated factors. Working with researchers in the tumour microenvironment and genetic instability theme, Isabel's research benefits from the biomarker development infrastructure in the early phase research hub.

### SPOTLIGHT ON PreOperative Brain Irradiation in Glioblastoma (POBIG)

Glioblastomas are the most common high grade primary brain tumour in adults, forming in cells used to support nerves cells. One of the most common ways of treating glioblastomas is through surgery. However, surgery cannot remove the whole tumour, and remnant tumour cells remain growing post-

surgery before the patient is given the standard course of radiotherapy. Therefore, better strategies are desperately needed to target all tumour cells at an earlier stage.

POBIG is the first known study to use preoperative radiotherapy for glioblastomas and aims to recruit a total of 18 patients and investigate whether pre-operative radiotherapy will prevent remnant tumour cells growing so quickly. During 2022/2023, POBIG met it's recruitment target and successfully completed the the first dose escalation step, increasing the

pre-operative RT dose from 8Gy to 10Gy. Samples of blood, tear fluid and tissue have now been collected from the irradiated and unirradiated sections with analysis now underway at collaborative organisations.

POBIG and its translational scientific programme is supported by Medical Research Council UKRI (UK Research & Innovation), Cancer Research UK RadNet Manchester and the MCRC. The Christie is the study's sponsor. BrainsTrust and The Brain Tumour Charity helped with the study design and facilitated excellent PPI engagement.



# Innovation in Early Detection

Driving international collaboration in early detection research is Manchester's membership of the International Alliance for Cancer Early Detection, a partnership between five UK and USA cancer research organisations and Cancer Research UK.

Manchester leverages this position to forge collaborative projects with international impact between Cambridge and UCL in the UK and Oregon and Stanford in the USA.

2022/2023 has further enabled the development of innovative clinical studies qUEST, COMPASS and BCAN-RAY with recruitment ongoing as well as the advent of new discoveries being made in modelling cancer at its earliest stages.

## The qUEST for biomarkers

Since ACED's inception in 2019, Manchester has initiated work to investigate inflammation and immunology markers in cancer samples.

With a historically high concentration of lung cancer incidence in the city, there is a necessity to commence work that shifts the detection of lung cancer to its earlier stages.

Through the qUEST and COMPASS trials, Manchester researchers are working to achieve this aim and identify lung cancer in its earliest stages. Recruitment to both trials is progressing well, with >6,500 individuals recruited to qUEST as part of Manchester's community-based lung screening service, and >100 to COMPASS recruiting patients who are having surgery for detected lung cancer.

## Modelling cancer outside of the body

Leading our analysis of how cancer develops within the body is our work in ex-vivo modelling, understanding how tumours develop from non-cancer to cancerous cells. Here our researchers are studying ways to model cancer outside of the body and develop human derived ex vivo models that mimic biological and biomechanical features of tissue to identify the earliest events in tumour lifecycle.

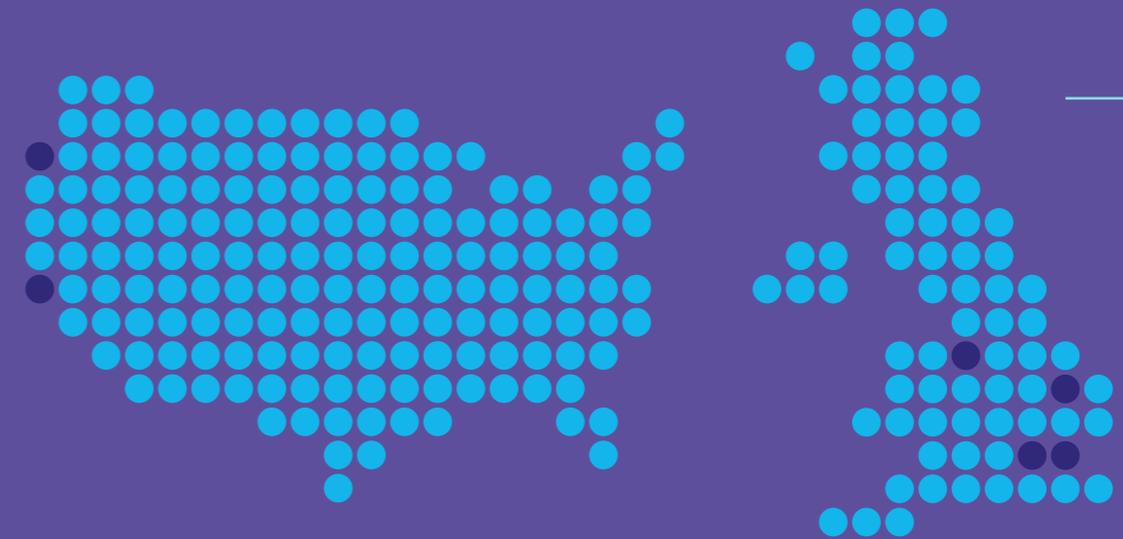
Our exemplar projects in breast and lung cancer cells are led by Dr Andrew Gilmore and Prof. Sarah Cartmell who are in the progress of developing 3D soft and stiff extracellular matrix (ECM) scaffolds for analysis of genomic instability.

## The future of early detection research

Leveraging the new NIHR Manchester Biomedical Research Centre and its Prevention and Early Detection theme as well as the CRUK Manchester Centre, over the next year, ACED Manchester will continue to drive recruitment in its active clinical studies. Moreover, ongoing and new collaborations with ACED members (such as through the new Immunology award detailed within the spotlight) means Manchester will continue to benefit from the alliance, enabling innovation in early detection.

In 2023, ACED launched a new flagship PhD Programme recognising the strong need to train the next generation of early detection researchers. The first students will commence their studies in Autumn 2023.

ACED INTERNATIONAL ALLIANCE FOR CANCER EARLY DETECTION



## SPOTLIGHT ON CED-Immunology Award: Exploiting the Immune System for Early Cancer Detection

Originating as an ACED 'Big Idea' in 2020 and led by Professors Robert Bristow and Jamie Blundell from Manchester and Cambridge, the ACED Immunology award is a new £5m project that aims to identify whether the body's own immune

system can be engineered to detect the earliest signs of cancer.

Beginning in 2023, this latest ACED project involves a collective team from across the five ACED partners and draws on decades of expertise in immunology, cancer biology and computational biology and artificial intelligence. Because early-stage tumours are small, often measuring <1cm across, detection is incredibly hard because the cancer-specific signals are weak and difficult to spot using imaging and traditional biomarkers.

The project aims to investigate whether natural B- and T-cells can be used as early warning signs that amplify the previously weak signals of early-stage cancer to enable detection. To achieve this, the international team will investigate which specific immune receptors can be used for cancer-surveillance, and whether these cancer-specific immune signatures are detectable via a simple blood sample.



# Cancer Research UK Manchester Centre

## Delivering Precision Medicine for All

Successfully renewed for a further five years in 2022, The CRUK Manchester Centre is a translational research centre that unites basic, translational, and clinical research to deliver on its vision. Throughout the first year of the new Centre, it has expanded on its five research themes that are underpinned by Education, Commercialisation and Equality, Diversity, and Inclusivity.

### Bridging the gap

The CRUK Manchester Centre works to translate the best basic and discovery research from The University of Manchester and CRUK Manchester Institute directly into the clinic.

As a vital academic bridge, research at the Centre focuses on early detection, cancer biomarkers, experimental cancer medicines, radiotherapy, and academic pathology.

Throughout 2022/2023, the Centre has been involved in multiple high impact research projects that leverage other infrastructure in Manchester such as the Experimental Cancer Medicine Centre, ACED, the Cancer Biomarker Centre or RadNet Manchester to achieve success.

Manchester ECMC was the first site to recruit patients to DETERMINE, a multi-centre, national platform trial and was supported by the CRUK Manchester Centre's Experimental Cancer Medicine theme. DETERMINE is the first UK national precision medicine trial in rare adult, paediatric and teenage young adult (TYA) cancers. It is hoped that by enrolling patients who have an identifiable genomic alteration, their cancer can be targeted by treatments that are already approved for use in other cancer types.

Also led by the Centre's Experimental Cancer Medicine and Radiotherapy BioAdaption themes, Manchester was the first site to open recruitment to the Phase 1b CRAIN trial. This study investigates whether a new drug, tolinapant, can help destroy cancerous cells and improve patient outcomes. To do this, patients are now being recruited to find the maximum tolerated dose for cervical cancer patients receiving radical chemoradiotherapy.

### Underpinning innovation

Crucial to the Centre's vision is training and development. Nine new non-clinical and clinical PhD students joined the Centre in 2022/2023 continuing our excellent track record of high-quality education and development opportunities. More information on the MCRC and CRUK Manchester Centres work attracting, training, and retaining future cancer leaders is reported on page 30.

Moreover, commercialisation and innovation remain core to the Centre, with researchers exploring opportunities in biomarker sciences and digital assets including machine learning and artificial intelligence ambitions.

Finally, Equality, Diversity and Inclusivity are core values of both the Centre and the MCRC. Throughout 2022 and 2023, EDI was spotlighted through our new seminar series: Let's Talk About... Each seminar in the series focused on a different theme, including LGBTQIA+ in research, mental health, and community, race and gender inequalities and enabled our researchers to tap into the wider CRUK network and hear about issues faced by other members of our academic community (see spotlight on page 27 for more detail).

## SPOTLIGHT ON RAPID-RT

For patients with lung cancer, radiotherapy is a common treatment option. However, recent evidence has emerged that irradiating the top of the heart increases risk of premature death. Following this review, in early 2023, The Christie updated clinical guidance to include a dose limit to the top of the heart during radiotherapy for patients with lung cancer, aiming to improve survival.

The RAPID-RT project is an observational study that aims to develop and evaluate a rapid-learning method to compare patient outcomes before and after the introduction of the new dose limit. Extensive patient and public co-creation, established patient priorities when balancing survival and potential side effects and the use of opt-out processes to allow patients to decide whether they include their data in this analysis or not.

Routinely collected structured data held in the ukCAT database will be

compared with data from patients treated after the introduction of the dose limit to the specific region of the heart and used to determine whether Christie patients are benefiting from changes in clinical practice.

RAPID-RT also aims to apply the rapid-learning methodology to other tumour sites and treatment modalities at The Christie in the future, as well as investigating the applicability to the broader NHS.



# Equality, Diversity and Inclusivity

The MCRC has a vision to deliver a cancer free future and provide 'Precision Medicine for All'. This means providing tailored treatments to people within all demographics of the population regardless of age, ethnicity, or gender identity.

We adopt our inclusive strategy to our research activities too. Our aim is to make research accessible and engaging, working with people from all backgrounds and gathering insight at all stages of the pipeline, from

concept through to delivery, and recognise everyone's contributions to a project, from PhD student and project manager, to chief investigator and patient representative.

## Patient and public involvement and engagement

Because cancer affects people from across the world, we strive to involve and engage patients, members of the public, or community representatives in our research projects to ensure we accommodate their voices and stories.

We collaborate with colleagues from across our partnership on all PPIE activities, and work closely with the PPIE team at the NIHR Manchester Biomedical Research Centre (BRC), VOCAL, to share insights and best practice with our researchers. Our end goal is to continue working with communities and organisations that help us to engage and reach individuals to tackle any health inequalities that may exist.

The following examples highlight how the MCRC is realising our commitments to PPIE.

## MCRC Commitments

To listen and respond to all our communities so that research represents and impacts our diverse populations

To work collaboratively in addressing societal inequalities and further understand attitudes to involvement in research

To place co-design at the centre of our research strategies, programmes, and projects

To ensure equity in the recruitment and retention of postgraduate researchers from underrepresented groups

To be committed always to equality, diversity and inclusion



### 'The Prostate Gap' photography exhibition

In February 2023 the Communications team worked with photographer Ian Smith to host a moving photography exhibition in the Oglesby Cancer Research Centre. The exhibition spotlighted a selection of prostate cancer patients from Black and LGBTQIA+ communities in Greater Manchester who courageously shared

their experiences of the barriers and cultural obstacles they experienced as part of their cancer journey. The exhibition received high praise and positive feedback from members of the public and was a discussion point for healthcare professionals and cancer researchers around Withington and beyond.

### Cancer screening in the LGBTQIA+ community

The MCRC hosted a special episode of the 'One in Two: A Manchester Cancer Research Podcast' in April 2023, which focused on the challenges that the LGBTQIA+ community and other marginalised groups face when accessing cancer care in the UK and ways to improve cancer screening uptake. The special episode featured Dr Jen Davies-Oliveira, a researcher and Clinical Research Training Fellow at The University of Manchester, and Stewart O'Callaghan, the Founder and Chief Executive of Live Through This, the UK's only LGBTQIA+ cancer charity. In the hour-long podcast, we covered Jen's ground-breaking research which is exploring the possibility of using a non-invasive urine test as an alternative to a cervical smear test as well as Stewart's experiences as a person living with cancer and how they came to set up their charity.



### Starting in Science' taster day

In October 2022, members of the MCRC and CRUK Manchester Institute welcomed four schools from across Greater Manchester to a taster day, designed to bridge the gap between A-level studies and a future career in science and cancer research. The day included various lab sessions where students learnt new techniques that were aligned to their A-level curriculum, including how to use a pipette, how to mark

and separate DNA, and how to use a Fluorescence-Activated Cell Sorting (FACS) machine. Students also took part in a Q&A session where they could put their questions to our researchers and scientists and find out more about a career in cancer research. The taster day was well received, and we look forward to welcoming more school students from across Greater Manchester into our labs again soon.



## "Let's Talk About..." seminar series

Throughout 2022 and 2023, the Communications and Education and Development teams alongside counterparts in other CRUK Centres hosted a series of Equality, Diversity and Inclusivity seminars called Let's Talk About... Over the course of seven seminars, we covered a range of topics including being LGBTQIA+ in research, work life balance, mental health, the signing Deaf community, women in cancer research, and being a Black cancer researcher. The seminar series has now expanded to include all seven of the CRUK Centres and we have a host of exciting and insightful new talks in store for the future so be sure to watch this space.

# International Impact – Collaborative Research

Cancer is a global healthcare challenge and requires a collective global community to unite and find new insights into the biology of the disease as well as new more precise treatments for the disease.

International research is a cornerstone of the MCRC which remains committed to working with international partners to accelerate the pace and scale of academic excellence. Throughout 2022 and 2023, the MCRC has continued this vision by furthering international relationships and strategic partnerships across the world.

## Internationalisation focus

The lynchpin of our Team Science ethos is building teams that work together towards a common goal, regardless of their location, to drive new interdisciplinary research. Central to this focus is our work exploring and connecting with individuals and forging international partnerships with organisations that share our vision and align to our values.

Academic research has always been international, and 2022/2023 has been no exception. For 2022, 62% of published Manchester research involved international collaboration and covered the entire spectrum of the research landscape. We have continued to build upon our transatlantic partnership as part of the International Alliance for Cancer Early Detection (see Page 22), as well as our strategic partnership with Kenyatta University Teaching, Referral and Research Hospital (KUTRRH), and joint development funds between Manchester-Melbourne and Toronto.

## Strategic collaboration between Melbourne, Manchester, and Toronto

The MCRC benefits from the strong history of bilateral relationships between The University of Manchester and the universities of Melbourne and Toronto, with a track record of established research seed funds, student exchange programmes, collaborative PhDs, and joint research developments.

Over the past year we have benefited from Joint Research Funds that have supported adult and paediatric cell therapy research supporting the iMATCH consortium.

More recently, Manchester has initiated the MMT-SEARCH (Manchester-Melbourne-Toronto Synergy cEntre for cAncer ResearCH) pump priming seed fund targeting cancers of unmet need, and research into advanced materials, early detection or AI and machine learning.

One such project targeting rare appendix cancers is led by Prof. Omer Aziz in Manchester and Prof. Alexander Heriot in Melbourne. Their project aims to study the evolution and trajectory of these rare cancers, while also standardising the collection and analysis of samples across Manchester and Melbourne. The team expect to complete their analysis in Q3 2023 and report results in early 2024.



## SPOTLIGHT ON Oesophageal cancer in Kenya

Internationally, incidence and mortality of cancers vary dramatically. Take squamous cell carcinoma of the oesophagus (OSCC) in Kenya as an example. According to the International Agency for Research in Cancer, OSCC is the third most common cancer in Kenya and the most lethal: 99% of patients die from their disease within 5 years.

Beginning in 2022, the MCRC and its partners The University of Manchester and The Christie worked to forge a unique partnership with Kenyatta University Teaching Referral and Research Hospital (KUTRRH) to raise awareness and increase engagement in screening and other early detection strategies for OSCC. By working together, we can share insights and knowledge that can greatly benefit people affected by OSCC in Kenya and help KUTRRH establish a 'Hub and Spoke' model akin to The Christie in Manchester.

We are now a year into this collaborative project and have had multiple visits to the hospital and its surrounding counties to provide insight and advice from methods that have worked well in the Manchester model. Reciprocating these visits, we have hosted many clinical fellows or pathologists from KUTRRH to Manchester for them to shadow and observe clinics and clinicians at The Christie or Northern Care Alliance, taking key learnings and ideas back to Kenya to implement into their healthcare system.

# Developing the Next Generation of Cancer Researchers

**With a postgraduate research community of over 300 students, creating future cancer leaders remains core to the MCRC.**

Delivered by our Education and Development team, our aim is to provide all individuals on our clinical and non-clinical PhD programmes with the opportunities to grow and develop their skills within and beyond the laboratory, becoming skilful individuals who will excel in their research careers.

## **Team science in action**

The MCRC works to unite all academic training programmes from our partners to provide educational opportunities for postgraduate researchers training in Manchester. Following the completion of the Paterson Building, this task will become more seamless as the geographical disparity between our training students is reduced.

By working closely with our partners at the Division of Cancer Sciences, Cancer Research UK Manchester Institute, NIHR Manchester Biomedical Research Centre, and The Christie School of Oncology, we ensure that our

students are exposed to both clinical and non-clinical workings, encouraging translational and reverse translational research.

## **Engaging A-level students**

A highlight of 2022/2023 was 'Starting in Science' work experience week between 27th September and 1st October 2022. Recognising the need to provide A-level students with opportunities to visit world-class laboratories and hear from scientists at the forefront of research, the MCRC worked with the CRUK Manchester and Beatson Institutes to deliver a programme of activities aimed at attracting future scientists.

Open to students who met a range of criteria and who might not have had opportunities in the past to see laboratories, the days were filled with engaging talks, laboratory sessions and a careers session giving students an idea of what a research laboratory looks like.

## **Working with our community**

It is crucial that cohorts of trainees reflect the diversity of our population and the MCRC remains committed to providing opportunities that encourage

people from all backgrounds to pursue a career in science. With feedback from the session very positive, we are now looking forward to future events that help encourage students to get started in science.

Moreover, in July 2023, we held an open day with the Manchester charity Can-Survive UK, giving our visitors the opportunity to find out more about research at the MCRC, a chance to visit our labs and take part in activities, and to open an honest discussion about the community's perspectives of research, and shared solutions going forward.

## **Spotlight on mentoring**

2022/2023 has seen the MCRC team focus efforts on developing mentoring schemes for students to share experiences with undergraduates and inspire those who might be thinking about commencing on PhD schemes. In January 2023, we launched a paid mentoring scheme for young, Black undergraduates appointing six mentors and mentees over the next year.

Preceding this, in September 2022, Dr Robert Tillman from Baylor College of Medicine presented at our Training the Next Generation of Cancer Leaders

education event. In addition to presenting about his own career path, leadership, coaching, and mentorship were key themes discussed supported by demonstrating some key individuals and metrics who had benefited from mentoring in the US.

## **Looking ahead**

Training and development is ongoing and the team are constantly seeking new ways to attract talented individuals, support their development, and encourage them to become future leaders. Most importantly, through the synergy created by the Withington campus there are now exceptional collaborative opportunities that further cements Manchester as the best place to conduct cancer research.



## **SPOTLIGHT ON Jean Ling Tan, First-Year MB-PhD student funded by CRUK**

My PhD research involves exploring potential ways to reverse chemotherapy resistance in ovarian cancer – the sixth most common cancer in UK females, which only has a 35% 10-year survival rate.

Ultimately, I hope that my research could lead to novel treatment combinations and the development of biomarkers – molecules that can be used to predict how well the body responds to a treatment – which help clinicians identify the most suitable drugs for each patient.

I chose to do an MB-PhD in Cancer Sciences as my goal is to become a clinician scientist and to combine my clinical practice with research, ultimately to lead my own research group in the future. Completing an MB-PhD now enables me to start developing my abilities as a scientist and build on those skills from an earlier stage.

**Scan the QR code to read Jean's story**



## **SPOTLIGHT ON Charlotte Mellor, Second-Year Non-Clinical PhD student, funded by CRUK Manchester Centre**

My PhD research involves investigating the proteins involved in apoptosis – the process of programmed cell death. I want to understand how cell death occurs in human cells to help our understanding of why some patients may develop resistance to certain cancer drugs and to ultimately contribute to the design of better cancer drugs.

I'm researching something I'm really passionate about and no one else in the world is doing quite the same research as me. It's a dream to be researching mitochondrial apoptosis and applying problem solving that underpins my research.

**Scan the QR code to read Charlotte's story**



# Communicating our Impact

The Communications team is led by Dr Joe Mowll-Clarke and supported by Reece Delaney and Sally Best. They work closely with the MCRC partners to communicate the impact of our research activities.

The team produces engaging content across our website, social media channels, publications and other platforms to showcase the work of our researchers and PhD students as well as delivering a series of high-quality events, including seminars, lectures and workshops.

Here are just a few ways the Communications team made their mark in 2022/2023



## One in Two: A Manchester Cancer Research podcast

To celebrate the impactful work of cancer researchers at The University of Manchester, the Communications team launched "One in Two: A Manchester Cancer Research Podcast" in collaboration with The University of Manchester Cancer Beacon Communications Team.

Across seven episodes, season one highlighted Manchester's expertise in cancer prevention, detection and diagnosis and featured leading academics from across our research community who discussed some of the latest discoveries that are shaping the cancer research landscape. Specific episodes highlighted the lung health check and the importance of community screening, using ex-vivo models to understand how cancer develops outside of the body, cervical screening and its connection to HPV and the risk factors involved in breast cancer. All episodes from the first season of episodes are now available.

Further episodes have since launched as part of season two, covering lung cancer research, documenting the basic and clinical research taking place in Manchester and spotlighting biomarkers mutations like ALK and KRAS as well as novel clinical trials.



## On Cancer with Policy@Manchester

In partnership with Policy@Manchester and The University of Manchester Cancer Beacon Communications Team, in 2022 we collectively launched 'On Cancer'. This latest publication was a comprehensive collection of the latest research being carried out in Manchester, while highlighting how distinct changes to national policy could impact research.

Stories highlighted include pioneering community-screening based early detection, levelling up advanced cell therapy provision in the North, as well as integrating digital technologies more readily into healthcare workflows.

To mark the launch of the document, the MCRC and colleagues from across The University of Manchester attended an in-person panel event in Westminster in March 2022 to discuss the cancer landscape in Greater Manchester and the growing body of evidence on which to base future healthcare policies. Engagement with policymakers is ongoing and our ultimate aim is to change national policy and benefit people affected by cancer.

## ESTRO

In May 2023 members of the MCRC attended ESTRO in Vienna, Austria to share the latest radiotherapy breakthroughs from Manchester and learn about wider research from the radiotherapy research community. Themes ranged from radiobiomarkers to clinical image-guided radiotherapy and radiomics.

Alongside many other Manchester presenters was our very own Director, Professor Rob Bristow, who presented his latest research on genomics-specific selection of radiotherapy patients focusing specifically on hypoxia and genetic instability.

Alongside the conference, the MCRC hosted a joint Academic Reception with The Christie. The networking event enabled our team to connect with new and former colleagues and discuss future collaborations with representatives of cancer centres across the world.



## A 'Day in the Life' of Non-Clinical and Clinical PhD students

Postgraduate researchers are the lifeblood of research in Manchester and as part of a series of activities in Summer 2022 and Spring 2023, the team was able to follow two of our amazing students Melanie Seaton and Dr Anu Datta to create two 'Day in the Life' videos.

The videos provide a snapshot into the lives of our postgraduate researchers and how they drive their own research projects, leveraging the facilities and partnerships in Manchester, whilst being supported by their academic mentors. The videos are available to view now on the MCRC website and YouTube channel.

No two PhDs are the same and every postgraduate researcher goes through their own journey and our team aims to capture their insights and advice for future prospective students. To recognise this individuality, this year, we launched a new section of the MCRC website dedicated to delivering a cross-section of experiences from clinical and non-clinical alumni and researchers.

# Commercialisation

Effectively harnessing research intellectual property (IP) is gaining importance as academic research progressively moves to a commercialisation-integrated model.

Helping academics navigate this complex landscape is Dr Nathalie Dhomen, MCRC Commercialisation Lead, who works with academic colleagues to help them identify, protect and commercialise valuable IP generated by the research community.

Nathalie supports projects at all stages of translation and can guide academics through various options when it comes to protecting and translating IP. She works closely with the research community:

- When a grant application asks an applicant to describe the translational potential of a proposed project
- To protect IP rights once encouraging data has been generated by research
- To support researchers on the road to licensing or spinning out

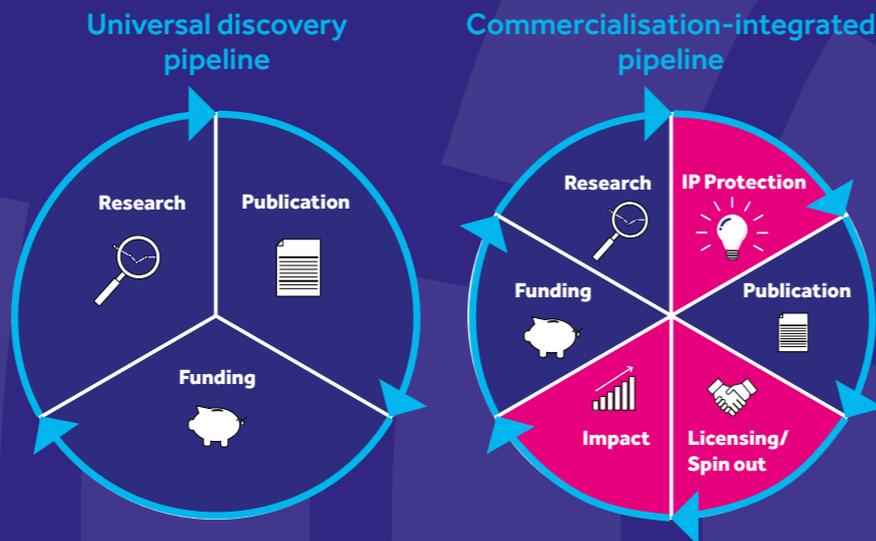
## Partner support

Commercialisation and IP protection is also supported through Nathalie's connection to the commercialisation partners of the MCRC. The University of Manchester Innovation Factory

Ltd is the University's agent for commercialisation and drives technology transfer on behalf of the University. Their mission is to use the IP developed at The University of Manchester to create positive social, economic and environmental impact.

The Innovation Factory works with University IP creators to identify research that has the potential to create value. It then translates these into a form where they can be used to benefit society. Researchers are supported in all areas of commercialisation from IP protection to market analysis, and business plan development to interactions with potential investors or licensees, through practical advice, dedicated project managers and translational funding resource.

Also available to researchers in Manchester is support from Cancer Research Horizons which drives translation and commercialisation of research that is funded by CRUK. In addition to providing similar services to the Innovation Factory, Cancer Research Horizons can provide access to translational labs and funding, strategic alliances, and promotes a culture of entrepreneurship through partnering with accelerators and bootcamps to help researchers test the commercial viability of their research. Examples of such accelerators include Lean Life Science's Oncology Development Programme 2 (ODP2) which returned after a successful initial outing in 2020 as the Oncology Development Programme, as well as the Cancer Tech Accelerator.



## Commercialisation CASE STUDY



Formed in 2021 as a spin out from The University of Manchester, Spotlight Pathology develops artificial intelligence (AI) based digital diagnostics platforms to assist in the diagnosis of blood cancers.

### What Spotlight Pathology do?

Spotlight Pathology are building two AI products that are both targeted at supporting the routine clinical blood cancer diagnosis. Its focus is on lymphomas, acute myeloid leukaemia and myelodysplastic syndromes. Through looking at tissue biopsies from a patient's lymph nodes and bone marrow, Spotlight Pathology's tools are able to automatically interpret pathology and provide either a high-level diagnosis or extract quantitative information that can be used to inform the diagnosis of the disease.

Spotlight Pathology's AI decision support software aims to improve pathology services and fulfill a previously unmet clinical need. The machine learning technology integrates with existing digital pathology infrastructure, and so integrates readily with existing hardware.

### A vision to change healthcare

Spotlight Pathology has identified AI as an emerging solution for issues in hospital pathology departments, such as understaffing and an increasing pathology workload. Its technology aims to assist in streamlining the traditional lengthy diagnostic triage process with an aim of making these tools available to clinical pathologists working within specialist teams across the NHS.

### The spin out journey

The journey to spinning out began in March 2020 when Dr Martin Fergie secured Innovate UK funding through the InnovateUK ICURE programme, a pre-accelerator programme for researchers, designed to help them explore the commercial application and potential of their research. Following this, in October 2021 Spotlight Pathology were able to spin out from The University of Manchester with proof-of-principle funding and began an Innovate UK Project to develop two technical support prototypes.

In March 2022, the company received pre-seed investment raised with Deepbridge Capital, and in the May of that year, the team received AI platform

validation through achieving second place in the survival leader board for the TIGER Grand Challenge. Following this, in July 2022, Spotlight Pathology started a collaboration with Manchester Foundation Trust to collect datasets of blood cancer diagnoses for their algorithm development. And in September 2022, they were awarded with the NIHR i4i Connect project grant to collaborate with Newcastle Upon-Tyne Hospitals Trust and the National Pathology Imaging Co-Operative (NPIC).

**Dr Martin Fergie,**  
Chief Executive  
Officer



Martin has over 10 years of experience with developing AI algorithms for image analysis tasks and, for the past five years, he has focused on using AI to develop biomarkers using advanced tissue imaging. Martin previously acted as Chief Technology Officer at DigitalBridge (now Fixtuur) from 2012-2017 and has been a Lecturer in Healthcare Sciences at The University of Manchester since 2017.

# Further MCRC Successes

## Cancer Revolution: Science, Innovation and Hope

Between 22nd October 2021 and 27th March 2022, The Science and Industry Museum in Manchester hosted an exhibition navigating patient stories, cancer causes and treatments, and the future of facing cancer. The tale echoed the hope around the future of cancer outcomes for patients. It details

the progress that has been made in prevention, diagnosis and treatment and the 'revolution' that now means more of us are living longer and better with cancer than ever before.

The exhibit featured the innovative research of multiple cancer researchers including Professor Caroline Dive and liquid biopsies; Professor Karen Kirkby and proton beam therapy; Professor Phil Crosbie and lung cancer health checks,

Professor Fiona Thistlethwaite and the late Professor Amit Patel and work on CAR-T therapies.

After leaving Manchester, the exhibit was displayed in the Science and Industry Museum in London where it exhibited between May 2022 and January 2023.

Scan the QR code to find out more



## Prof. Petra Hamerlik joins the MCRC

Prof. Petra Hamerlik, one of the world's leading brain tumour researchers has joined The University of Manchester, MCRC and Geoffrey Jefferson Brain Research Centre to develop translational brain tumour research as the first-ever The Brain Tumour Charity Chair of Translational Neuro-Oncology.

Petra will build a programme focussed on the development of pre-clinical patient-derived xenograft models and capabilities to inform on central nervous system tumour biology and the discovery of novel targets for drug and immunotherapy treatment.

The newly-created Chair role has been made possible thanks to a grant worth around £1.35 million from The Brain Tumour Charity – the largest dedicated funder of research into the disease globally.

Scan the QR code to find out more



## rEECur study identifies the best treatment for rare childhood cancer

Results from the Phase II/III rEECur trial, comparing four different treatments for Ewing sarcoma has found that quality of life was improved for children treated with ifosfamide. This rare cancer is only diagnosed in 60 children and young people in the UK each year but there

is no standard treatment for recurrent Ewing sarcoma. This study helped to compare different chemotherapies and demonstrate improvement to survival and quality of life.

These results were presented by Dr Martin McCabe at the American Society of Clinical Oncology Annual Meeting 2022.

Scan the QR code to find out more



Scan the QR code to find out more



## Groundbreaking Manchester partnership with Kenyan oesophageal cancer initiative gets £2.6m award

The funding contributes to the development of a "hub and spoke" system linking cancer hospitals and local healthcare authorities at KUTRRH in the capital Nairobi with five regional counties: Meru, Kiambu, Kisii, Nakuru, and Nyeri. Research will seek to accelerate early detection of squamous cell carcinoma of the oesophagus.

A unique partnership between The University of Manchester, The Christie NHS Foundation Trust, and Kenyatta University Teaching, Referral and Research Hospital (KUTRRH) will raise awareness of squamous cell carcinoma of the oesophagus (OSCC) in Kenya. OSCC is the third most common cancer in Kenya and the most lethal: 99% of patients die from their disease within 5 years.



### The Christie is the first UK hospital to become a European Prostate Cancer Centre of Excellence

The Christie has been named as one of the inaugural European Prostate Cancer Centres of Excellence. The specialist cancer centre in Manchester is the only facility in the UK to be given the accreditation. The Christie was judged to have met several criteria across three key areas: clinical care, research and education that were set by the European Association of Urology.

### Cancer Researchers Recognised as NIHR Senior Investigators

The Government's main funder of health research, the National Institute for Health and Care Research (NIHR) has announced the appointment of its new Senior Investigators from The University of Manchester and The Christie NHS Foundation Trust. Of the 27 new appointees and the 29

re-appointees, congratulations to newly appointed NIHR Senior Investigators:

- Professor Corinne Faivre-Finn
  - Professor Janelle Yorke
  - Professor Katherine Payne
- and the re-appointment of:
- Professor Tim Illidge

Scan the QR code to find out more



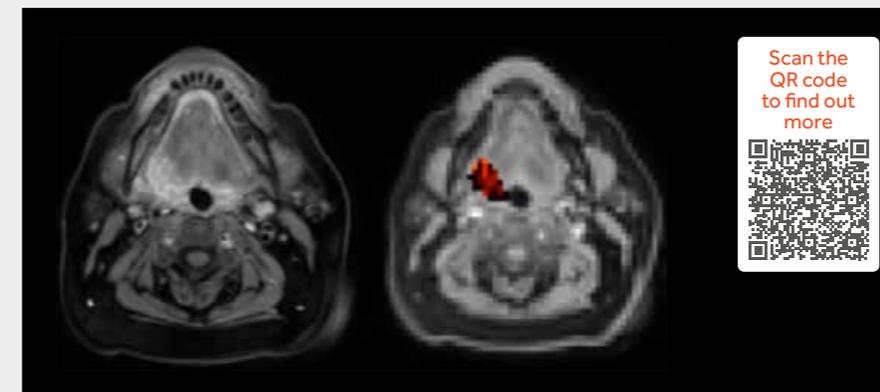
### GM Cancer Conference 2022

Between the 18th and 19th October 2022, GM Cancer held its latest conference bringing together patients, healthcare professionals, and researchers for an event focusing on equality, innovation and collaboration. Alongside the conference, GM Cancer also hosted an awards night with the following research-focused award winners:

- Commitment to Equality Award going to the digital Experimental Cancer Medicine Team for commitment to inclusive technology in clinical trials
- Research Award going to Prof. Emma Crosbie and her research group for their work testing womb cancer for Lynch syndrome
- The Innovation Award went to the Christie electronic patient recorded outcomes measures (ePROMs) group



### Scientists advance dream of targeted real time treatment of hypoxic cancers



New research from The University of Manchester, working with scientists at the Institute of Cancer Research, UCL, and The University of Leeds, and published in the Journal Radiotherapy and Oncology has demonstrated a major step towards their goal of identifying cancers that are starved of oxygen so that altered treatment can be used to target them more effectively. The breakthrough was achieved by successfully scanning 11 patients with head and neck cancer on the MR-Linac at The Christie and obtaining maps of oxygen levels in the body evaluating areas of hypoxia in tumours.

# MCRC Vision

“  
*Cancer Precision For All: Uniting translational science and driving clinical excellence to create a future free from the burden of cancer*  
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## Mission

To enable us to achieve our vision, we need to ensure precision treatments and medicines are equitable and embrace the diversity of our entire population. The MCRC will lead in the development of cancer precision research that enables cancer to be identified earlier and curative treatments to be delivered to everyone.

Our aim is to unite the best science with world-leading clinical care by leveraging our synergistic Team Science approach, to break down research silos and enable interdisciplinary and inter-organisational collaboration.

By encouraging innovative thinking and creating opportunities for collaboration, we can unite and translate the basic and discovery scientific work performed in state-of-the-art laboratories with novel patient treatments. These will influence clinical practice and ultimately change patient outcomes.

It will take a One Manchester approach to align the best research across the University, trusts, and funders directed towards improved outcomes in Greater Manchester and beyond.

## Values



**Openness and Transparency**



**Interdisciplinary Scientific Excellence and Research Co-creation**



**Championing Innovation**



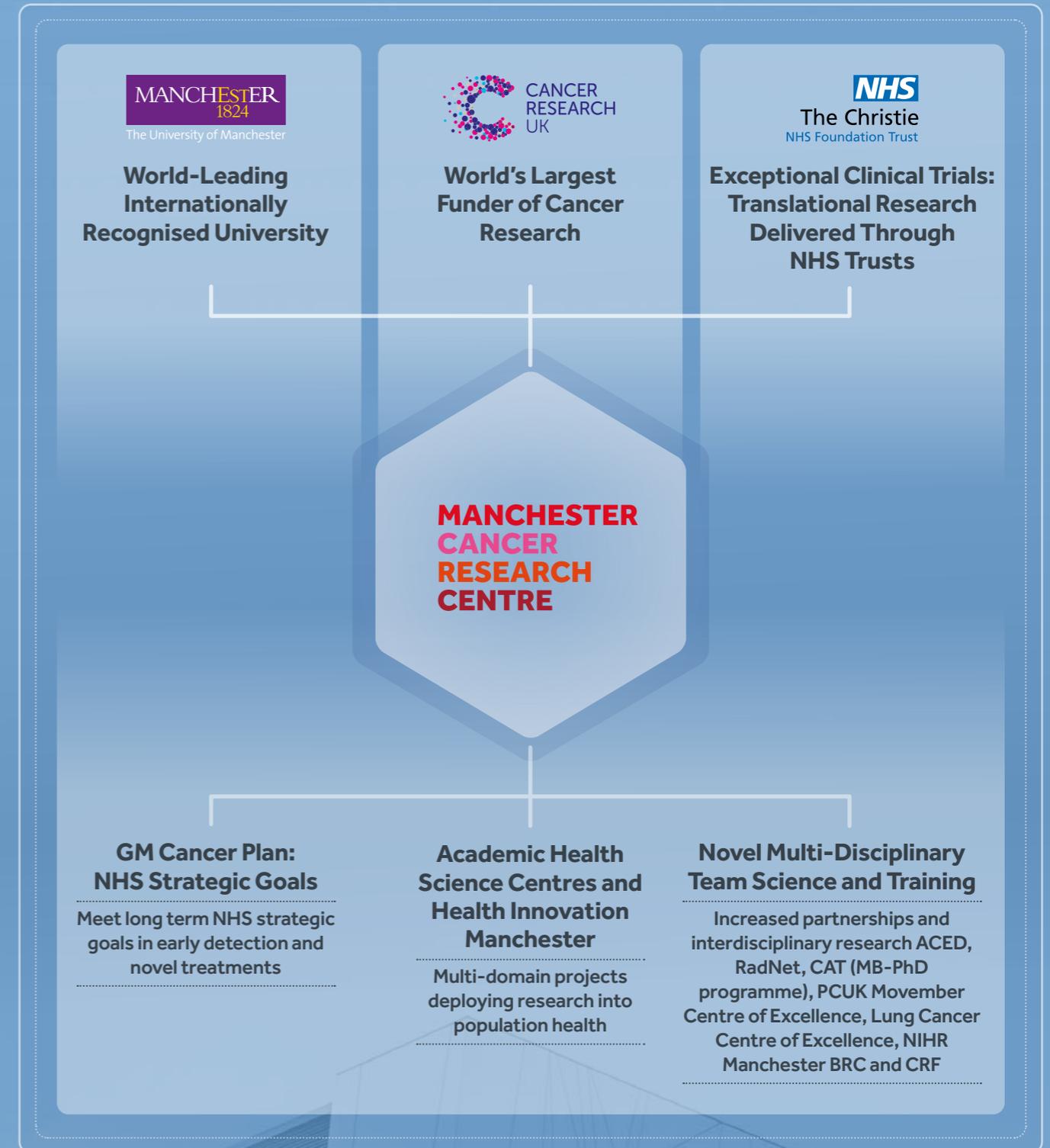
**Scientific Integrity**



**Creating Opportunities to Excel**



**Equality, Diversity, and Inclusivity**



# International Advisory Board: Peer-Reviewed Research Excellence

Supporting our world-leading cancer research, the MCRC established its International Advisory Board, meeting annually to assess and advise on scientific direction, current work and future ambitions of the MCRC and CRUK Manchester Centre. After meeting multiple times virtually, in November 2022, the IAB met in-person in Manchester, touring our world-leading facilities and meeting our researchers.

## The board

The MCRC IAB comprises experts from across the world with specialisms in multiple research fields spanning basic and clinical research. Their input is vital for the MCRC to remain at the forefront of innovative cancer research.

**Prof. Henricus De Koning,** Deputy Head and Professor of Public Health & Screening Evaluation, Department of Public Health, Erasmus MC University Medical Centre, Rotterdam, The Netherlands.



**Prof. David Jaffray,** Chief Technology and Digital Officer, MD Anderson Cancer Center, Texas, USA.



**Prof. Karen Knudsen,** Chief Executive Officer of the American Cancer Society (ACS) and its advocacy affiliate, the American Cancer Society Cancer Action Network, USA.



**Prof. Patricia LoRusso,** Professor of Medicine (Medical Oncology), Yale University/Yale Cancer Center,



**Prof. Ignacio Melero,** Professor of Immunology and Co-head Immunology and Immunotherapy, Universidad de Navarra and Senior Oncology Consultatnt, Clínica Universidad de Navarra, Pamplona, Spain.



**Prof. Sheila Singh,** Professor of Surgery and Biochemistry, Chief Paediatric Neurosurgeon at McMaster Children's Hospital and Director of the Centre for Discovery in Cancer Research at McMaster University, Toronto, Canada.



**Prof. Bertrand Tombal,** Chairman of the Department of Surgery and Full Professor of Urology at the Université Catholique de Louvain (UCL), Cliniques Universitaires Saint-Luc, Brussels, Belgium.



**Prof. Daniel Zips,** Chair of Radiation Oncology and Director, CCC Tübingen-Stuttgart, University Hospital and Medical Faculty, Berlin, Germany.



## Important benchmarking for the MCRC

Following the IAB's November 2022 evaluation, the IAB were impressed with the quality and impact of research presented and provided insight into how this could be enhanced.

The session focused on four of the MCRC's research themes, including: the Digital Cancer Centre, Advanced Materials Group, Experimental Cancer Medicine, as well as specific projects and disease sites, including: the Lung disease site group, the Breast disease site group, the Manchester-Kenya collaboration, Early Career Haematology programmes.

Particular attention and emphasis were placed on the MCRC Town Hall events which have now realised multiple projects, including Dr Mark Williams haematology project (see page 12).

EDI was also a spotlight that the IAB highlighted seeing projects such as the Kenya – Manchester Global Health Research programme as an example of impactful international co-creation (more detail provided on Page 29).



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