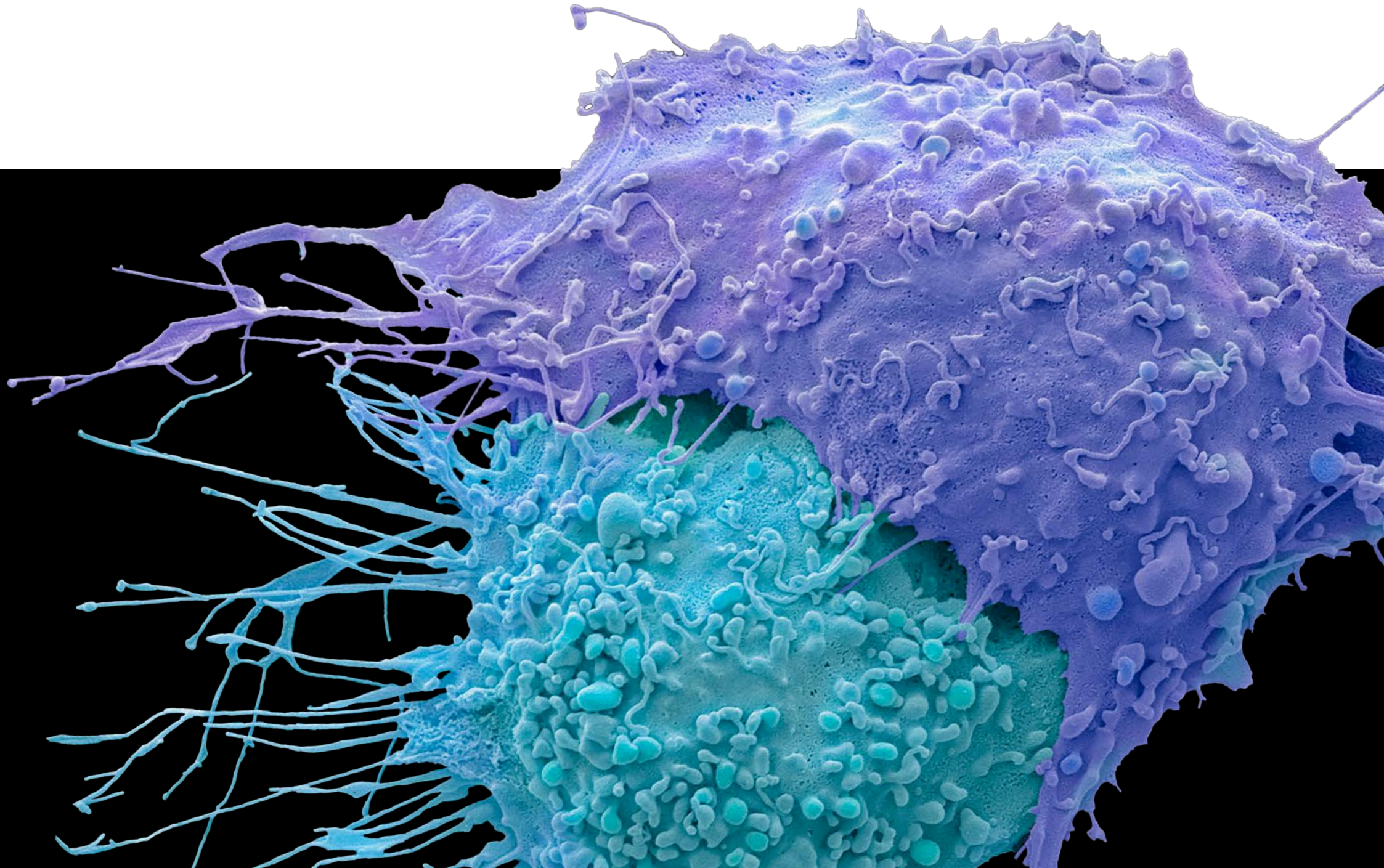
MAKING DISCOVERIES. DRIVING PROGRESS. BRINGING HOPE.

OUR RESEARCH STRATEGY

CANCER RESEARCH UK

Together we will beat cancer



CONTENTS

OUR VISION FOR A BETTER FUTURE

We know that it's unlikely there will ever be a single cure for cancer, but we also know that it can be beaten, and that research holds the key.

We asked people affected by cancer, researchers, clinicians, supporters and staff what beating cancer means to them. They told us that it's a world where everybody lives longer, better lives, free from the fear of cancer.

A world where:

- some types of cancer are effectively eliminated
- many more cancers are prevented from developing in the first place
- people who do develop cancer are diagnosed at the earliest possible stage so they can be successfully treated
- treatments are more effective, kinder and more targeted, so people can lead better, more fulfilling lives
- everyone shares in this progress equally, regardless of who they are, where they're from or what type of cancer they have

EXECUTIVE SUMMARY

We will:

- invest in world-class research undertaken by a diverse and inclusive community where participants reflect everyone who is affected by cancer
- put discovery research and excellence at the heart of everything we do to help us understand how tumours develop, grow and spread, how they interact with the rest of the body and how they evolve and evade treatments
- continue to fund outstanding research on the early detection of cancers and pre-cancers, sharpen our approach to cancer prevention and support work across the pathway of discovering, developing and optimising cancer treatments
- remain committed to improving outcomes in cancers of unmet need and cancers that affect children and young people by building collaborative networks and funding excellent research
- grasp the ever-growing opportunities to use data science wisely and fairly to answer important questions in cancer research
- support high-quality clinical research that is informed by discovery science, addresses critical clinical questions and is underpinned by biological mechanisms
- provide effective pathways, teams and facilities for therapeutic innovation to ensure our research is translated into treatments and interventions that can be deployed, not only in health systems across the UK, but globally

To achieve all this, we will:

- continue to train and develop our research workforce
- create equitable and sustainable research environments
- create a culture where translation and commercialisation are explicitly valued
- build transformative partnerships to access funds, capability and capacity

Dr Iain Foulkes
Executive Director Research & Innovation

PUTTING DISCOVERY AT THE HEART OF EVERYTHING WE DO

Professor Charles Swanton
Chief Clinician

Professor Karen Vousden
Chief Scientist

Over the past 120 years, our work has revolutionised what we know about cancer and how it can be beaten.

We have made discoveries that have saved countless lives and benefitted millions around the world each year. The tools we now have at our disposal to unravel cancer's secrets, and to diagnose and treat those affected by it, are beyond anything we might have imagined just a few decades ago.

Many of these tools are rooted in insights from scientific disciplines beyond cancer research. And that, of course, doesn't surprise us. Biology – in health and disease – has no regard for how we choose to label certain scientific or clinical disciplines. That's why it's so important that discovery research is pursued without being constrained by a tight definition or disciplinary boundaries. For us, this means we must create environments that allow rapid cross-fertilisation of ideas.

Cancer Research UK and its founding organisations have an unrivalled track record of making scientific discoveries and translating them into interventions to save and improve lives the world over. Discovery has underpinned everything we have been about – from Alexander Haddow's observation that early nitrogen mustard chemotherapies weld DNA's double-helix together, to Paul Nurse and Tim Hunt's Nobel Prize-winning studies of dividing yeast and sea urchin cells, through to Margaret Frame's work on cell adhesion networks.

And yet, despite all this progress, too many people still die prematurely from cancer. The disease isn't picked up early enough in many people, resistance develops to the most sophisticated therapies and we know too little about how cancer evolves to evade the body's systems. As a result, living with cancer can be fraught and unpredictable.

Despite everything we know about cancer, there is still so much about it that is shrouded in mystery. How do the different subclones in a tumour cooperate with each other to survive? How does cancer affect disparate and distant bodily systems, causing pain, muscle wasting and fatigue? How do inflammatory signals initiate cancer? Why isn't cancer more common, given the numerous mutations we now know exist in normal tissue? How do signals from the environment contribute to tumour initiation and how, in turn, do tumours subvert their niche and influence the body as a whole to promote their survival? How can we understand the risks to any individual of developing different types of cancer and minimise these?

To find answers to these and many more questions, and drive progress for people affected by cancer, we now need to build on the strategy we set out back in 2014. We are incredibly proud of the work our research community has done since then, and it's only right that we refresh our approach as our understanding grows, as technologies advance and as new questions arise, building on what has already been achieved. We remain committed to supporting a broad portfolio of excellent discovery research, as we know this is the essential foundation to enable innovation and development of effective interventions to beat cancer. This is discovery with purpose. Indeed, we believe that the distinction between 'discovery research' and 'clinical research' is holding us back and that we need to remove the barriers between these disciplines, with more clinicians working in research labs, and more basic scientists engaged with studies involving human participants. This will enable us to support clinical studies of the highest quality that are informed by biological understanding and that, in turn, maximise new insights into mechanisms that can be generated from data and samples.

We also want to rethink our approach to drug discovery and other treatments, building on the promise of biotherapeutic and new drug discovery technologies, as well as the detection and prevention of cancer. We need smarter trials to develop and understand effective therapies that can control and even cure cancers. And we want to see more of the discoveries made as a result of funding from Cancer Research UK translated efficiently to ensure people affected by cancer benefit from them. We will place more emphasis on this and support researchers with new funding routes for translation, as well as providing clinician scientist and entrepreneurial training programmes.

Removing barriers between disciplines has been key in our growing understanding that cancer is a whole-system condition. We will continue to build on this recognition to incorporate a more integrated and complex view of tumour ecology. And we will look to bring together expertise from diverse disciplines in new forums to drive discussion, debate and collaboration.

By putting discovery and patient benefit at the heart of everything we do and making an absolute commitment to ensuring research excellence drives our decisions, we are uniquely poised to help lead the next phase in humanity's mission to beat cancer.

OUR STRATEGIC FRAMEWORK

OUR PRINCIPLES

Valuing our people	Reducing cancer inequalities	Involving patients and the public in our research

OUR RESEARCH OBJECTIVES

Discover	Prevent	Detect	Treat

OUR APPROACH: MAINTAINING MOMENTUM

Prioritising cancers that affect children and young people	Tackling cancers of unmet need	Deepening our understanding in radiobiology and radiation oncology	Driving further progress in early detection	Going further with clinical research

OUR APPROACH: NEW OPPORTUNITIES

A new vision in cancer prevention research	A new strategic approach to data science	Driving therapeutic innovation

OUR ENABLERS

Drive innovation	Build transformative partnerships	Create a positive research environment and culture

OUR PRINCIPLES

VALUING OUR PEOPLE

Our investment in creative people who can deliver research of the highest quality will underpin everything we do.

We believe that the best research happens when researchers collaborate effectively and work in fair, inclusive and supportive environments. We will develop an even more diverse research community that will attract senior leaders to the UK and where researchers at all career stages will thrive. By drawing on a wide range of ideas from a variety of backgrounds, our community will bring a breadth and depth of perspectives to maximise creativity and scientific innovation for the benefit of everyone with cancer and at risk of developing it.

We will engage with researchers, people with cancer and the wider public to regularly review and improve our funding and evaluation processes, policies and culture. And we will be uncompromising in our expectations of the research environment and culture in the organisations that receive our funding, and proactive in supporting and monitoring progress across this important area, working closely with others across the sector who share this commitment.

We want researchers from all backgrounds and disciplines to be excited by the opportunities and feel supported throughout their careers in cancer research.

We will:

- continue to prioritise training and career development, providing funding opportunities at all career stages and working with partners to reduce the lack of job security at transitional career points
- foster diversity of talent and work with our partners to continuously improve equality and equity issues in our research workforce
- work with our networks and partners to deliver the right training and mentoring to enable a healthy, productive and inclusive research culture
- improve the career path for high-quality clinician scientists by encouraging our institutes to train clinicians in discovery research and by promoting greater interaction between clinician scientists and discovery, population and data science researchers. We'll also work with our partners, including the NHS and universities, to address the increasingly challenging environment that trainees and consultants must navigate in their clinical academic training pathways
- review the mechanisms that support training for all PhD students, including doctoral training programmes, to ensure these are delivered in host institutions that provide optimal environments and that graduate students have effective support to achieve their potential
- build on our targeted support for a broad range of multidisciplinary researchers – from both traditional cancer and non-cancer fields – and ensure this is available for those at mid-career stages
- consider co-funding senior research awards to attract inward recruitment of talent in strategic areas, in partnership with leading universities

PROFESSOR KAIRBAAN HODIVALA-DILKE

Professor Kairbaan Hodivala-Dilke began work as a research assistant in London before studying for a degree in biology and a PhD in cell biology. She spent five years working as a postdoc at MIT in the US before returning to the UK with a tenure-track fellowship from the Imperial Cancer Research Fund, which is now part of Cancer Research UK. In 2004, she joined Barts Cancer Institute at Queen Mary University of London and became Professor of the Tumour Microenvironment and Deputy Director of the institute in 2009.

With a Cancer Research UK programme grant, Kairbaan and her team are researching molecular mechanisms in the tumour microenvironment that influence tumour growth, metastasis and treatment efficacy. They are working to improve the effectiveness of immunotherapy, chemotherapy and radiotherapy in solid tumours, and have patented approaches for targeting angiogenesis that they believe will translate into patient benefit.

In recent years, Kairbaan has been awarded Fellowship of the Academy of Medical Sciences, the British Society for Cell Biology's Hooke Medal, EMBO membership and Queen Mary University of London Woman Scientist of the Year, all of which she says were possible thanks to her Cancer Research UK funding.

SPOTLIGHT

OUR EDI IN RESEARCH ACTION PLAN

In terms of equality, diversity and inclusion (EDI), at Cancer Research UK we're already leading by example by:

- ensuring fair and inclusive funding processes
- providing career support and development opportunities that attract and support underrepresented groups
- promoting inclusive research design
- developing a robust evidence base to drive change

However, we know there is more to do. Our action plan sets out the steps we are taking to build an even more equal, diverse and inclusive research community. In developing this plan, we listened to feedback from our research community on how to effectively tackle systemic issues, such as racial bias and inequality.

We're focused on addressing inequalities in who is applying for and being awarded our grants, and increasing applications from, and awards to, female researchers and researchers from ethnic minority backgrounds. We're also committed to ensuring equality of opportunity for all – whatever their socio-economic background – and removing any barriers to this.

An example of how we will achieve this is to engage with groups of people who are currently less represented in research to understand the barriers and issues they face. We will also support more young people from underrepresented backgrounds to enter academia and stay in research, including working with school-age children to encourage them to consider a future in science. And we'll continue to promote a positive research culture, including for people with disabilities.

We know that diverse teams working with diverse samples and participants will result in research that stands to impact the greatest number of people in our society. So we have set rigorous diversity targets for our funding committees and are encouraging grant applicants to consider diversity in their teams. We'll also ensure our communications with researchers are inclusive and accessible, and champion the work of researchers from a wide range of backgrounds.

REDUCING CANCER INEQUALITIES

Cancer doesn't affect everyone equally. There are differences in cancer types, stage of diagnosis and treatment between different groups of people and these lead to differences in outcomes and experiences.

The reasons why this happens are complex and deeply woven into the structural, demographic and socio-economic inequalities in our society, which affect all aspects of living healthy lives.

Research to understand what causes and exacerbates these differences is essential to enable us to tackle inequalities in cancer incidence and improve patient outcomes for everyone. For example, we would like to fund more research to understand more about the potential biological underpinning of ethnic differences in cancer aetiology.

We will continue to build on our work to tackle inequalities in cancer by funding ambitious, multidisciplinary research into the issue, such as investigating how ethnicity, geography and socio-economic factors relate to differences in people's cancer journeys, from the first primary care consultation through to diagnosis and eventual outcomes.

Research needs to be designed differently – so that it's truly inclusive – to ensure the outcomes benefit everyone. For example, we will address underrepresentation of some populations in our cancer trials and wider clinical research work. And we expect large-scale population studies to involve a diverse group of participants.

Tackling and eliminating cancer inequalities is a long-term challenge. Everyone – researchers, research institutions, research funders, industry and policymakers – needs to act now and work together to bring about systemic change.

INVOLVING PATIENTS AND THE PUBLIC IN OUR RESEARCH

To make our research as impactful as possible, we are committed to involving people affected by cancer in our work.

This means supporting patients, and their carers and families, to influence and shape our research. For example, we consulted our patient panels on this research strategy and their views have informed its development, and we will continue to involve them in our implementation plans and report on our progress in delivering it.

We will also seek input from members of the public, who may not have previous experience of cancer, particularly for our research on cancer epidemiology, prevention, early detection and diagnosis.

This work involves samples and data from those with and without cancer to ultimately provide new options for screening and potentially preventing cancer.

To ensure working with us is a positive experience, we will provide ongoing support and training for patient and public representatives, working with partners and research organisations to share knowledge and best practice in this important area.

OUR RESEARCH OBJECTIVES

We fund world-class research to tackle the burden of cancer through the delivery of four objectives: discover, prevent, detect and treat.

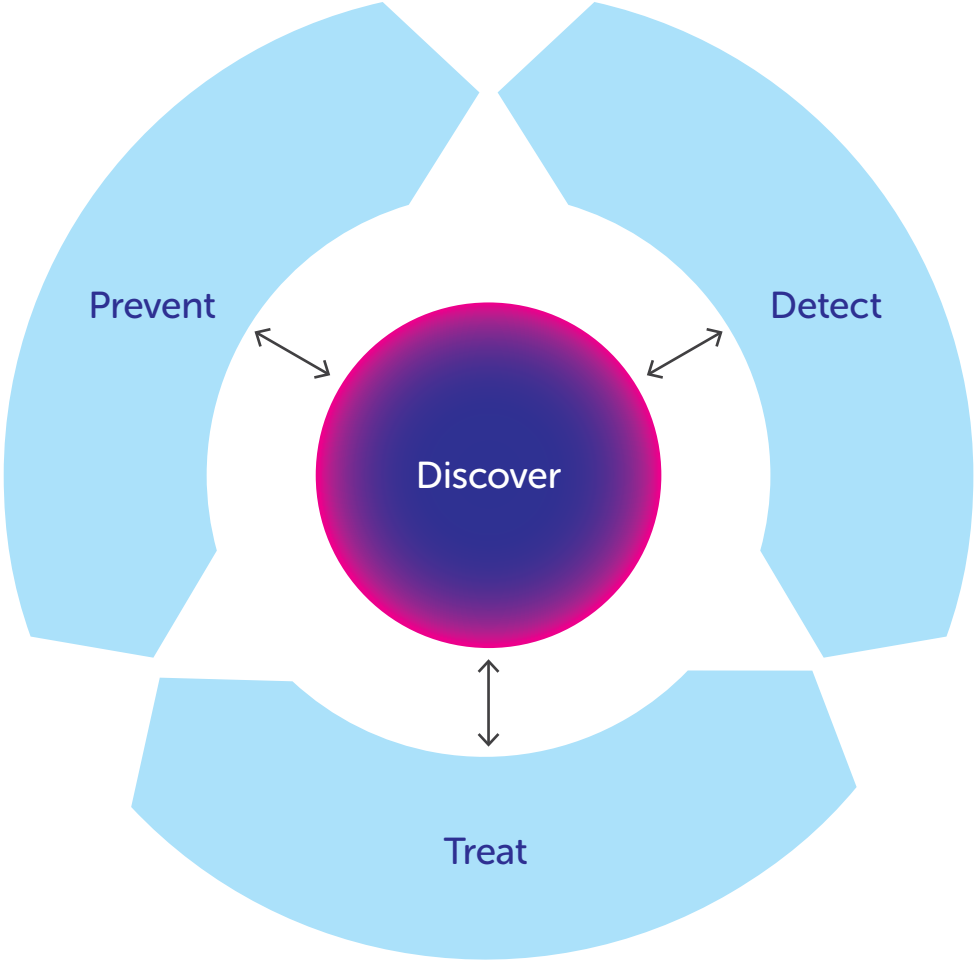
These objectives are not isolated from one another; they form a virtuous cycle where deeper understanding of every aspect of cancer ultimately leads to longer, healthier lives.

Discover: We will understand the mechanisms of how cancer develops and progresses to unlock new and better ways to prevent, detect and treat it

Prevent: We will use biological insights to inform a new wave of preventive interventions that decrease cancer incidence equitably across society

Detect: We will detect cancer at the earliest point of intervention by understanding the underlying biology of cancers and the transition from health to early disease

Treat: We will use biological discoveries about the mechanisms of how cancer evolves to inform clinical studies



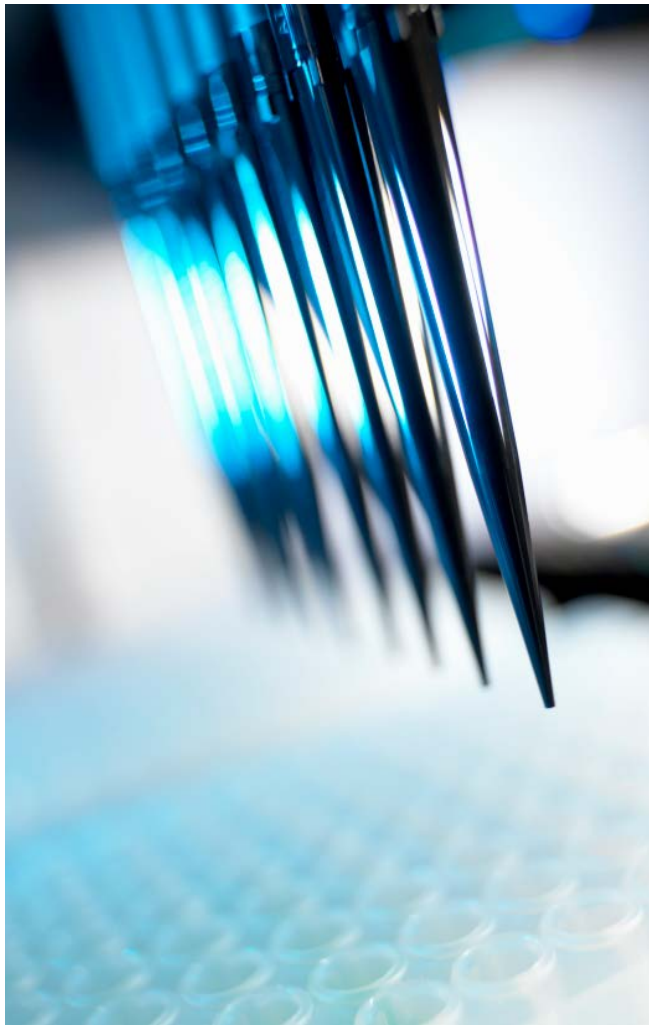
DISCOVER

We will capitalise on our exceptional track record and keep discovery research at the heart of all we do.

Discovery research is a strength for Cancer Research UK and for the UK as a whole, and we believe that it is crucial in order to continually increase understanding of how and why cancer develops and progresses, and therefore how it can be most effectively prevented, detected and treated. We will take the opportunity to develop this further by encouraging more collaboration across a diverse range of research fields, such as immunology and inflammatory disease, cardiology, neurology, endocrinology, and metabolism and appetite regulation.

Increasingly, discovery research involves big data, informatics and machine learning. We value hypothesis-generating work that seeks to find correlations – for example, through omics, data science and epidemiology – and works hand-in-hand with hypothesis-led discovery research aiming to uncover underpinning mechanisms. And we believe that data can and should be repurposed and reused for other relevant research, so we will make sure it's curated and stored in safe environments.

Discovery research also needs to take advantage of cutting-edge model systems to gain deep mechanistic insights into cancer and progress findings into human-specific contexts. Where appropriate, this will be through the use of patient-derived samples and data. >>>



KEY INVESTMENT IN OUR INSTITUTES

Our institutes in Cambridge, Manchester, Glasgow (Beatson) and London (Francis Crick) provide an exceptional environment for discovery research. They are home to more than 120 research groups who work across the breadth of cancer science, supported by state-of-the-art facilities, and who have an outstanding track record, including producing four Nobel Prize-winners.

These institutes will remain our flagship investments in long-term, strategically relevant discovery research, which we'll continue to complement with a broad portfolio of response-mode funding.

To gain the most value from them, we will continue to work closely with their scientific leadership to ensure their world-leading work is aligned with our strategy.

We will prioritise their role in training and support innovation and commercial development of their research outputs for potential patient benefit.

Going forward, our institutes will serve as key technical and knowledge hubs, facilitating wider access to world-leading facilities and capabilities.

DISCOVER

We will also increase our focus on whole-body physiology and how tumours interact with their immediate and more distant environments. For example, modulation of immune factors, insights into the biology of cancer initiation and evolution, and the disruption of human physiological processes will inform (and be informed by) our work in our prevent, detect and treat objectives. In order to achieve this, we will proactively bring together researchers across a wide range of disciplines to accelerate translation into effective interventions, building on work from our previous strategy that successfully developed our immunology and multidisciplinary communities.

While we maintain the strength of our existing research portfolio to inform treatment of established disease, we will increase our focus on understanding the mechanisms of early disease development and progression to help develop new detection and therapeutic interventions aimed earlier in the disease course.

Already, we have created an Early Detection and Diagnosis of Cancer Roadmap that aims to unite fragmented efforts across the UK, connect discovery science into other fields and drive progress in this area. We will produce similar roadmaps and implement them to move from discovery-led research, through to translation, commercial development and adoption in health systems across the UK, in areas such as data and cancer prevention.

In our clinical research, we will support high-quality biologically rich trials and studies that utilise innovative and adaptive designs to maximise what we learn from every participant. We will also continue to support some trials that look to refine current treatments, including trials for radiotherapy and surgery, and for children and young people affected by cancer, which are less likely to be funded by industry or other bodies.

In all of these areas, we expect mechanistic insights to be embedded in new research proposals and built upon in our existing portfolio, creating an overall shift towards greater mechanistic understanding.

This is an opportunity not only to consider whether an intervention is effective, but also why. And to gain a better understanding of, for example, how tumours evolve to be resistant to therapies, how toxicities can be better predicted and managed, and how combinations of therapies can be optimised to tumour biology.

We want to accelerate the virtuous cycle between discovery, translational and clinical research to spark more major advances and help us realise our ambition to beat cancer.

DRIVING RESEARCH TOWARDS PATIENT BENEFIT THROUGH OUR CENTRES

Our centres bring together research teams from universities, NHS hospitals and other research organisations to fund training and support technologies and projects to translate cutting-edge discoveries into direct benefits for people with cancer.

Over the next five years, we're investing £100m into seven centres: Cambridge, City of London, Convergence Science, Manchester, Newcastle, Oxford and Scotland.

This investment will create opportunities for the next generation of scientists and provide vital infrastructure to drive translational research in the locations where the majority of our discovery research can be found.

SPOTLIGHT

CANCER GRAND CHALLENGES

Cancer Grand Challenges is our global funding initiative, co-founded with the National Cancer Institute in the US.

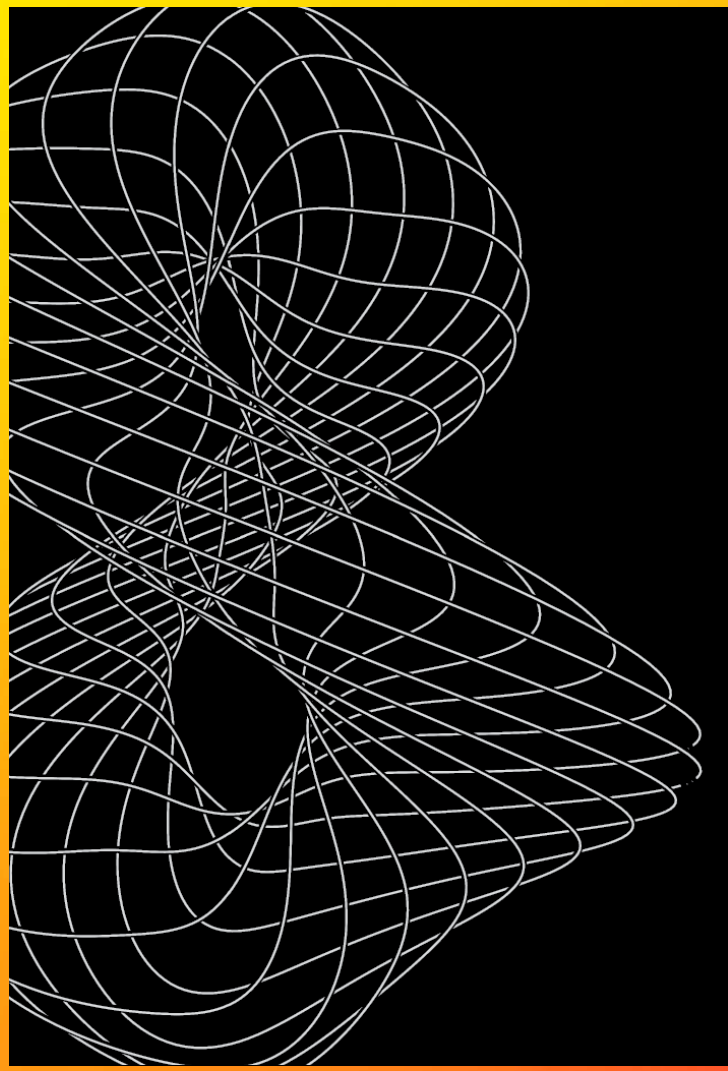
It supports a worldwide community of investigators to come together, think differently and take on the challenges that continue to impede our progress against cancer.

Investigators are empowered to rise above traditional boundaries, with biologists, chemists and clinicians uniting with astronomers, computer scientists and even video game designers to produce novel technological platforms, optimise model systems and probe the underlying mechanisms of tumour biology to answer long-standing questions in cancer research.

For example, in taking on the 'Unusual mutation patterns' challenge, one team brings epidemiologists together with cancer biologists and genomics experts. Together, they are developing novel animal models and machine learning approaches, and connecting patient samples and clinical data from 26 countries to understand why the incidence of certain cancer types varies so dramatically around the world.

This new way to study the epidemiology of cancer has enabled researchers to look at population-wide patterns of mutations to explore exposure to specific carcinogens and the role played by DNA damage in the journey to malignancy.

Among other important findings, this collaboration – the first of its kind at such scale – has challenged the classical view of early tumour development, revealing that many carcinogens act via non-mutational processes to promote the growth of mutated cells.



CANCER GRAND CHALLENGES

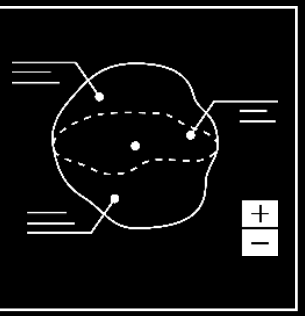
The toughest challenges in cancer research

Cancer Grand Challenges works with the global research community and people affected by cancer to identify the toughest challenges in cancer research, and then dares diverse, world-class teams to take them on.

Here is a selection of the challenges currently being addressed by the Cancer Grand Challenges community.

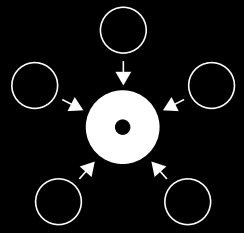
3D tumour mapping

Map the molecular and cellular tumour microenvironment in order to define new targets for therapy and prognosis



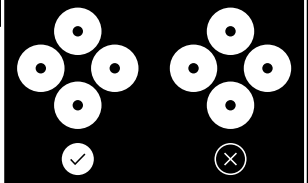
Cancer causes

Understand how lifestyle factors, such as obesity, cause cancer



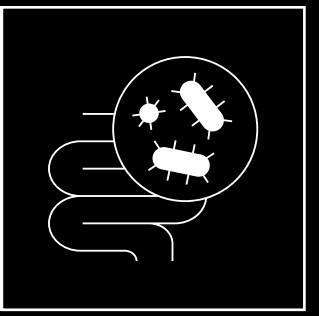
Lethal vs non-lethal cancers

Distinguish between lethal cancers that need treating, and non-lethal cancers that don't



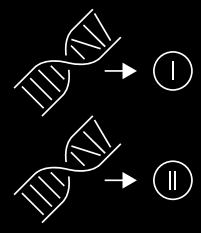
Microbiota

Understand how microbes inside our bodies affect cancer treatment



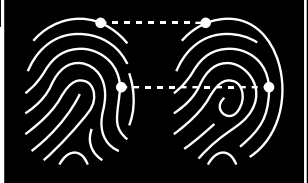
Tissue specificity

Understand why mistakes in certain genes only cause cancer in specific parts of the body



Unusual mutation patterns

Discover how unusual patterns of mutation are induced by different cancer-causing events



PREVENT

We have a strong history of supporting important epidemiology and behavioural research that has transformed our understanding of cancer risk factors and how to modify these to prevent cancer.

But with cancer incidence increasing, prevention research remains critical for saving lives and reducing pressure on health systems across the UK.

We will sharpen our approach to cancer prevention by focusing on research that redefines our understanding of which cancers could be prevented and how. This means deepening our understanding of cancer risk and harnessing fundamental biological insights to provide new prevention targets. It also means gaining a better mechanistic understanding of the complexities of interrelated cancer susceptibilities in order to deliver precision prevention, including improving our understanding of how metabolism, obesity, nutrition, alcohol, physical activity, polluted air, infection, immunity and the microbiome impact on cancer initiation.

And finally, it means addressing the stark impact of inequalities in cancer incidence and attracting new researchers with new ideas to build prevention research capacity.

Our aim is to inform a new wave of preventive interventions that are precisely targeted to drive down cancer incidence equitably across society.

Explore our vision for prevention research on p42.

> “It’s a great time to increase our ambition in prevention research. The tech – which has been lacking – is now catching up, allowing population studies to properly measure exposures and aspects of biology”
>
> Professor Kay-Tee Khaw,
> University of Cambridge

DETECT

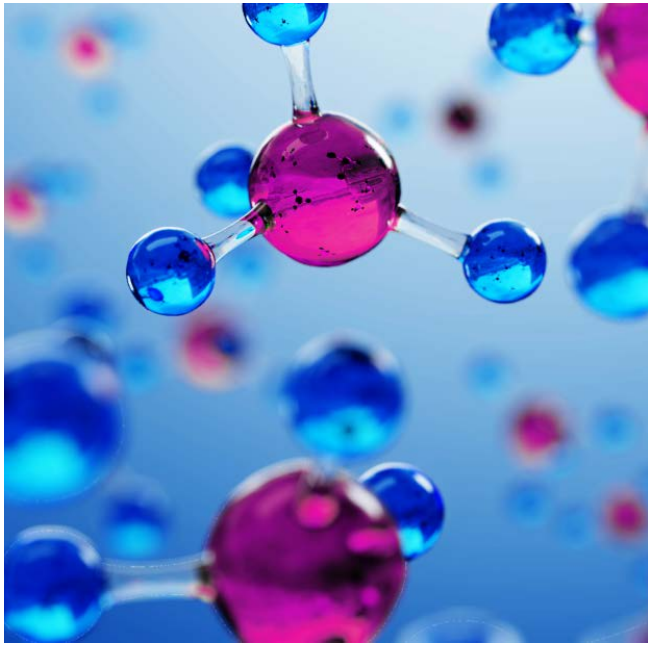
We know that when cancer is diagnosed earlier, treatment is often more effective and cures are more readily achievable.

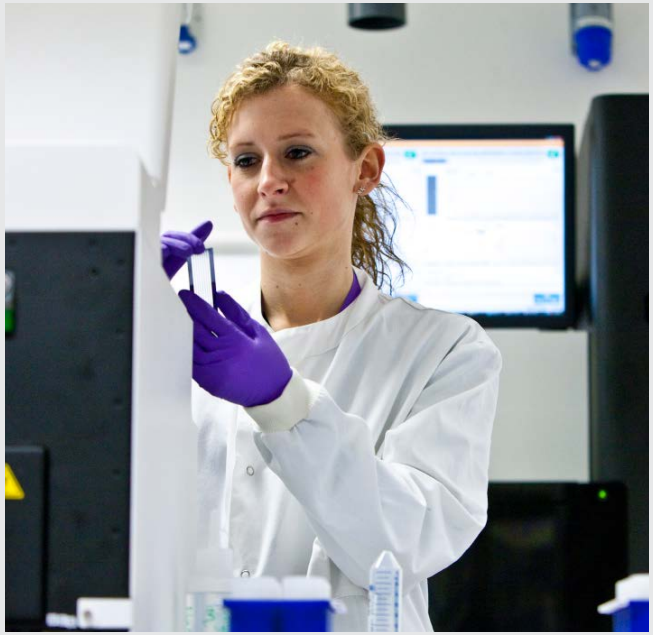
So we will continue our strategic focus on the early detection of cancers and pre-cancerous changes. This will be built around an understanding of the underlying biology of cancers and the rest of the body, and of the transition from health to early disease. Crucially, it will also entail increasing our understanding of the mechanisms through which some early cancers and pre-cancerous changes will go on to be consequential and life-threatening, and some will remain indolent and inconsequential.

With this knowledge, we will be able to ensure that consequential cancers or pre-cancerous states are detected at the earliest timepoint at which an intervention might be made. Meanwhile, understanding more about how cancers develop will inform translational research into how they can be 'intercepted' and, in turn, lead to more precise ways to prevent, detect and treat them.

To achieve this, we will continue to build capacity in early detection research in the UK and promote multidisciplinary approaches and international collaboration to identify new ways to diagnose cancers, including effective ways to identify and screen people at higher risk.

Read about how we're driving progress in early detection on p36.





INTERNATIONAL ALLIANCE FOR CANCER EARLY DETECTION

The International Alliance for Cancer Early Detection is a £55m partnership between Cancer Research UK and teams of world-leading researchers in the UK and US.

Together, they are working to translate research into realistic ways to improve cancer diagnosis, which can be implemented into health systems and benefit people with cancer around the world.

This ambitious, collaborative approach means we can take on the biggest challenges, break down research silos and align efforts.

TREAT

We will continue to support research across the pathway of discovering, developing, optimising and evaluating cancer treatments. Our goal is to deliver effective treatments that are better tolerated to enable people to return to healthy, cancer-free lives.

We also recognise that, at least for now, a significant proportion of people's cancers will only be diagnosed when they are already locally advanced or as metastatic at later stages, where opportunities for cure are currently more limited. We want to ensure cancer treatments for people in this position are both kinder and more targeted, so people can lead better, more fulfilling lives for longer.

Improvements in cancer detection will see more cancers diagnosed when they are small and localised, which increases the possibility of surgical removal and/or treatment with radiotherapy, chemotherapy and adjuvant therapies. For many patients, this will achieve a cure; however, in some patients the cancer will return and is then often much harder to treat. We will need insights from discovery, imaging and data science to help identify people who may be at a higher risk of recurrence – for example, through better surveillance of micro-metastases and circulating tumour DNA and circulating tumour cells – and improved strategies so that we can help prevent recurrence or detect it earlier, aiming to improve the chance of successful treatment.

Also, as we learn more about how cancer evolves and evades treatments, we will seek to develop more rational approaches to combining and sequencing treatments to improve and prolong cancer control for people with metastatic cancer.

These innovations in treatment, whether surgery, radiation or drug-based, will be made possible by deep biological understanding of the mechanisms of how cancer evolves and the processes that enable it to evade treatment, subvert the immune system and ultimately progress. These discoveries must then inform clinical studies that use innovative designs to reach answers sooner.

And we must also make the most of the valuable contribution every person makes when they join a clinical study and learn as much as possible about their physiology and the biology of their tumour through clinical data, blood samples and, where it's ethical, safe and practical, biopsy analysis.

Furthermore, enabling scientists to access normal and tumour autopsy material donated by patients after their death will further enhance our biological understanding of metastatic disease and drug resistance.

We will work with people with cancer and the public to continue to develop effective and secure routes to making data and samples readily available to discovery scientists to inform and advance our understanding of cancer.

NEW HOPE WHERE TREATMENTS HAVE FAILED THROUGH OUR DETERMINE TRIAL

Our Centre for Drug Development has partnered with the University of Manchester and Roche to launch the nationwide DETERMINE trial. Researchers will enrol children and young people with cancer and adults with rare cancers who have run out of treatment options on to the trial, and they will be offered treatments according to genetic alterations in their cancer that are already approved for use in other cancer types.

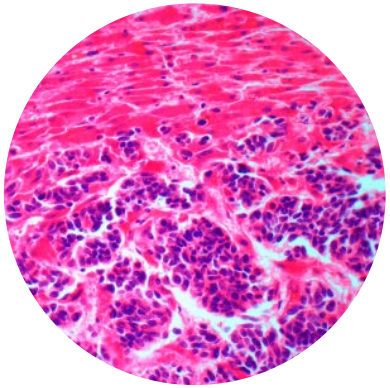
The researchers will then evaluate the patients' genomes, transcriptomes and immunology, and how they influence the response to treatment. Any treatment shown to benefit patients on the trial could be fast-tracked towards approval in UK health systems via the Cancer Drug Fund.

OUR APPROACH: MAINTAINING MOMENTUM

When we published our previous research strategy in 2014, we laid out a set of priority approaches where we knew progress was needed to improve outcomes for people affected by cancer.

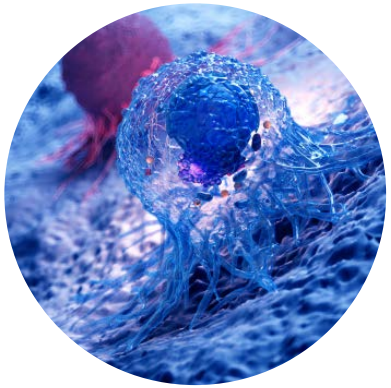
These continue to be important and so here we restate our approach in these five areas. We'll build on our successes and ensure our work brings benefits to more patients in the future.

Prioritising cancers that affect children and young people



Tackling cancers of unmet need

Deepening our understanding in radiobiology and radiation oncology



Driving further progress in early detection

Going further with clinical research

PRIORITISING CANCERS THAT AFFECT CHILDREN AND YOUNG PEOPLE

Despite improvements in overall survival over the past 40 years, cancer remains the leading cause of death by disease in children and young people (aged 0-24 years) in the UK.

Survival for some children's cancers hasn't improved much since the 1970s. And many of those who do survive experience serious, long-term side effects from their treatment. We need more research to better understand this disparate group of diseases and develop more effective and less toxic treatments.

However, we need more researchers to contribute to this area and to increase connections between those with relevant expertise. We want to address the lack of data and research models, and insufficient industry support.

We'll continue to work closely with partner organisations who share our ambition to tackle these challenges and potentially scale our activities.

Our statement of intent for children's and young people's cancer research sets out how we will continue to invest in this area:

- **Building research capacity in the UK**

  We will support research across this area and invest in developing a highly skilled workforce to ensure that some of the brightest researchers are supported to build their careers in tackling cancers that affect children and young people.

  We've invested in an initial round of Cancer Research UK–Children with Cancer UK Innovation Awards to support researchers answering questions in children's and young people's cancers and attract researchers from other areas. In parallel, our SU2C-CRUK Paediatric Cancer New Discoveries Challenge is providing international funding to drive multidisciplinary, transatlantic collaboration and knowledge-sharing.

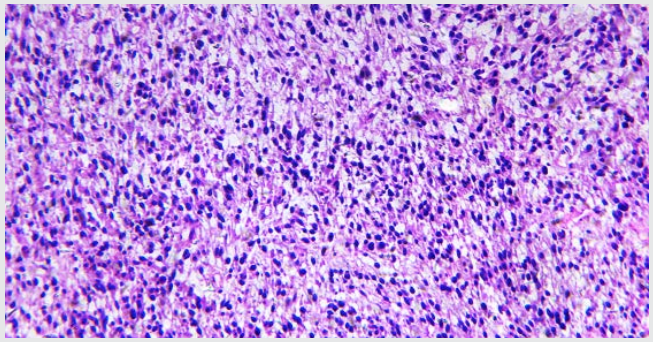
- **Developing and supporting a coordinated research community**

  We will convene scientists and clinicians from different disciplines to build the networks necessary to drive progress. By engaging and collaborating with research communities not usually associated with cancers that affect children and young people – such as developmental biology and neuroscience – we will encourage them to apply their wide knowledge and expertise to this area of cancer research.

- **Ensuring the research community has the tools and infrastructure it needs to progress**

  Many cancers in children and young people are relatively rare, so carefully curating and sharing data and samples is vitally important to accelerate progress. Of course, this must be done under conditions that stay true to the intent of those patients and families who agreed to provide them. We will build and link together resources, for example research data and tissue samples, and fund the development of vital research tools through our funding award schemes. We will also work in partnership with funders, researchers, the pharmaceutical industry, and people with cancer and their families to drive progress, awareness and advocacy.

By focusing on these priority areas, we aim to increase high-quality research across the translational pipeline and in all types of paediatric cancer. We want to support researchers to overcome the challenges so we can increase the chance of survival for children and young people with the disease and improve their quality of life during and after treatment.



UNCOVERING THE ORIGINS OF RHABDOMYOSARCOMA

Rhabdomyosarcoma is believed to originate from cells in the developing embryo that don't usually exist after birth. We're funding researchers at the Wellcome Sanger Institute, UCL and the Institute of Cancer Research, London to create an atlas of 250,000 tumour cells taken from people with newly diagnosed and relapsed rhabdomyosarcomas.

They are studying tumour DNA and RNA at a level not achieved before in terms of both detail and number of samples. And they are combining this genomic and transcriptomic insight with mathematical modelling to better understand how these cancers grow, spread and resist treatment, which could lead to potential therapeutic targets.

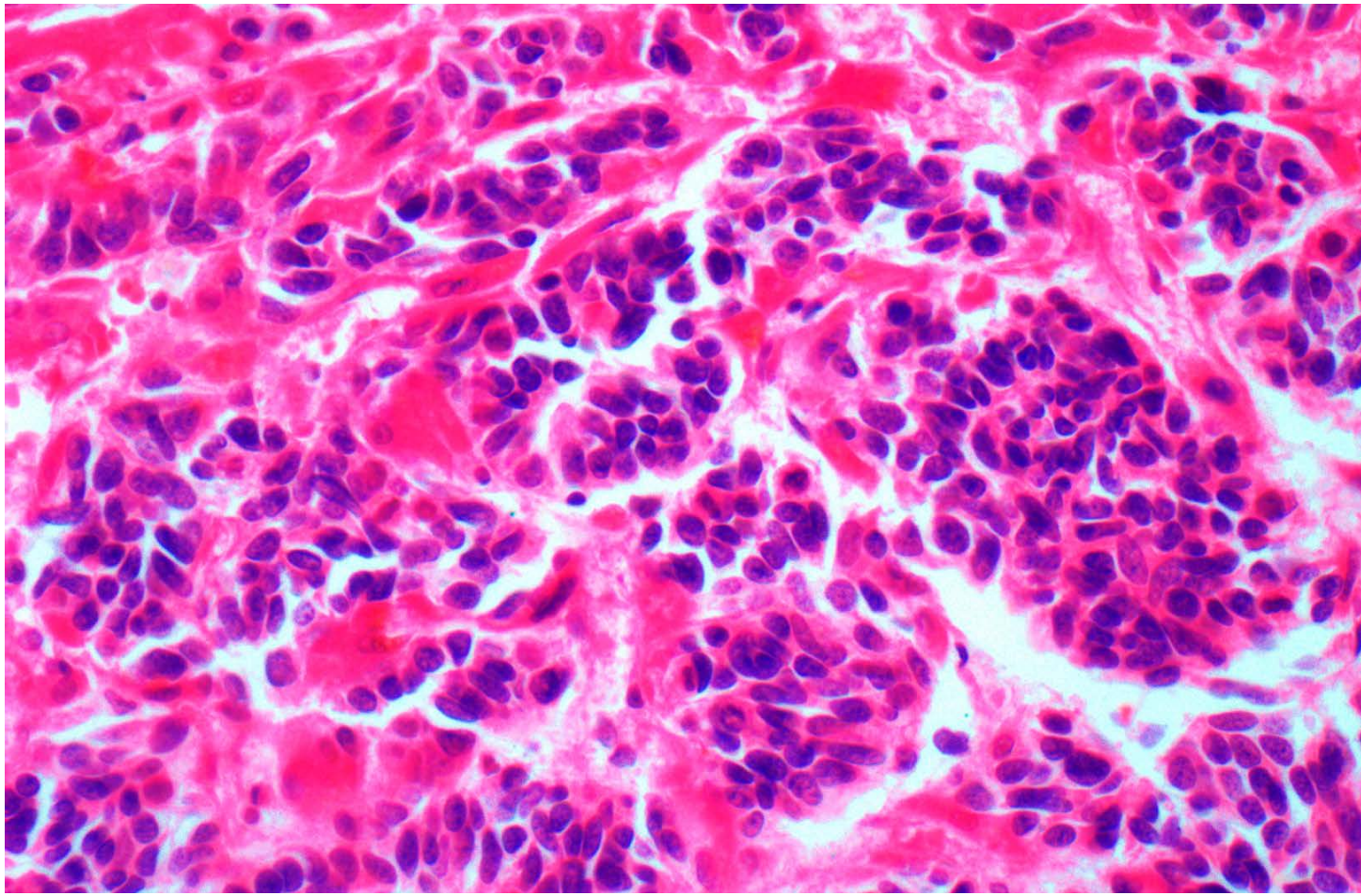
The team will make all their data freely available so other researchers can build on their findings to drive momentum in the field.

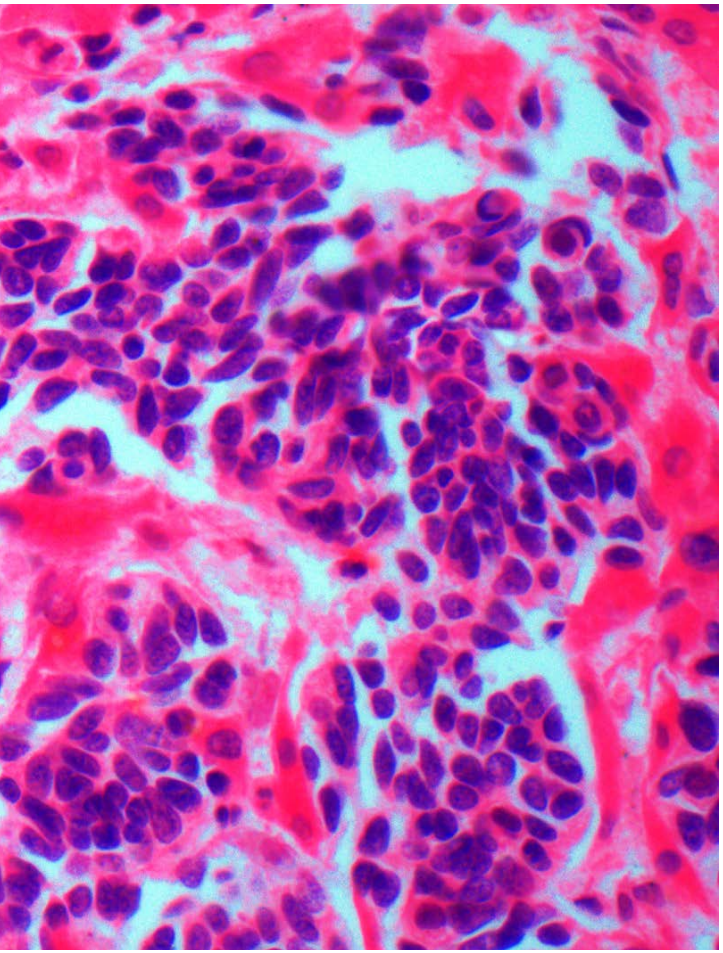
TACKLING CANCERS OF UNMET NEED

In the UK, overall survival for people with cancer has doubled in the past 40 years, with 2 in 4 now surviving their disease for 10 years or more.

However, there are some forms of cancer where survival has improved very little and there are limited routes to new therapeutic avenues. Since 2014, we have increased funding for research into brain tumours, and lung, pancreatic and oesophageal cancer, which have some of the poorest five-year survival figures.

We will maintain a focus on improving outcomes for these four cancers, as well as liver and stomach cancers, which also have five-year survival below 25%. Improving outcomes for these cancers is vital if we are to accelerate progress and see 3 in 4 people survive their cancer for 10 years or more by 2034.





In order to improve outcomes in these specific cancers, we will:

- build on our successful investments and learn lessons from where there's been less progress since 2014. For example, we know that joining together excellent research teams and creating environments that have the depth of capacity and quality to deliver step-changes in research leads to progress. In particular, we'll support efforts to understand the underlying mechanisms of cancer and apply this knowledge to improve outcomes for people with the disease
- support improved training for our researchers working in these cancer types, especially clinical academic scientists, and fund research to create better disease models such as the engineered cell lines developed by researchers in Edinburgh and UCL to study brain tumours and how they respond to treatments
- work with partners to leverage added value from our funding and promote greater visibility of programmes such as Cancer Grand Challenges

We do also recognise that there are unmet needs in all cancers and will continue to ensure that our portfolio addresses these where high-quality research is proposed.

UNITING EXPERTISE TO MAKE INROADS IN BRAIN AND LUNG CANCERS

In collaboration with the University of Manchester and UCL, we have created a centre of excellence for research into lung cancer.

We've also established two joint centres of excellence in brain tumour research: one at the University of Edinburgh and UCL, and the other, which focuses on paediatric brain tumours, at the University of Cambridge and the Institute of Cancer Research, London.

These three centres are building much-needed research capacity and are developing the people and tools needed to improve outcomes for these two cancers of unmet need.

DEEPENING OUR UNDERSTANDING IN RADIOBIOLOGY AND RADIATION ONCOLOGY

More than a quarter of people with cancer in the UK receive radiotherapy as part of their treatment and it's a key component of curative and palliative care and long-term cancer control.

However, radiotherapy could bring even more benefits to people if we can grow our knowledge of the underlying biology, further refine treatment approaches and improve our understanding of how to combine radiotherapy with other treatments.

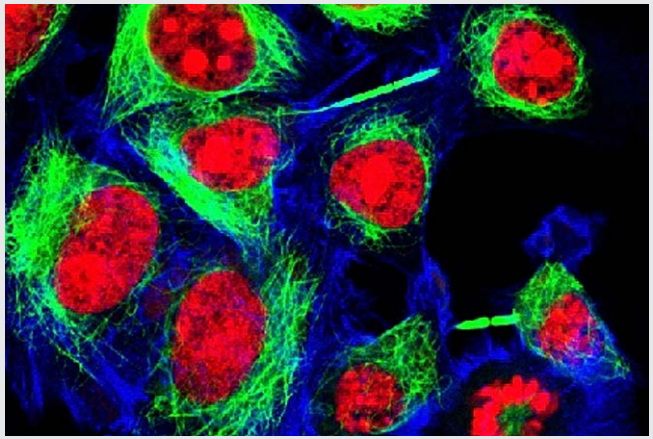
In 2018, we commissioned an independent review to ask how we should best support radiobiology and radiation oncology in the coming years. The review highlighted the need for a coordinated research network with access to cutting-edge facilities and the importance of building the UK radiation research community through training, events and collaboration.

Subsequently, we launched RadNet, our network of seven centres of excellence based in Cambridge, Glasgow, Leeds, Manchester, Oxford, City of London and the Institute of Cancer Research, London with the Royal Marsden Hospital. Together, they are providing the infrastructure and expertise needed to research how to make radiotherapy more effective while minimising side effects.

We've also invested in an allied health professionals' academy in Manchester and funded more PhDs and early career researchers through the centres of excellence.

In order to build on our understanding in this area and drive better patient outcomes, we will:

- support and fund researchers who are improving our understanding in the area. This includes work to develop models to study the effects of radiation on cancer cells, radiation-resistant cancer cells and healthy tissue, and studies investigating how the immune system and combining treatments can impact the effectiveness of treatment, while reducing damage to healthy tissue
- capitalise on recent NHS investments in proton beam therapy by supporting RadNet researchers to understand the link between the biological understanding and clinical application of this technology. This includes our recent funding of the UK's first proton beam clinical trial, TORPEdO, which will determine whether proton beam therapy reduces long-term side effects and improves quality of life for people with oropharyngeal cancer



DEVELOPING A DRUG TO BREAK DOWN CANCER CELLS' DEFENCES

Cells activate repair mechanisms when they suffer DNA damage. Our research has shown that these mechanisms can begin to fail in cancer cells and when that happens, they can switch on a 'reserve' repair mechanism controlled by DNA polymerase theta, or POLθ. Studies have also revealed that POLθ is overexpressed in many tumours and high levels of the enzyme are associated with poorer outcomes in people who have been treated with radiotherapy.

Based on these findings, scientists in our Therapeutic Discovery Labs initiated a POLθ inhibitor project. The first potential POLθ inhibitor drug to enter the clinic, developed in partnership with Artios Pharma, is now entering early trials.

DRIVING FURTHER PROGRESS IN EARLY DETECTION

The earlier detection of cancer is an essential element in improving overall cancer survival. But we cannot rely on existing diagnostic techniques. We need more research and development to bring new early detection and diagnosis approaches into health services across the UK.

In our 2014 strategy, we recognised that research into the early detection of cancer was historically underfunded and we've made great efforts to counter this. We will continue with this work; however, the field is still hampered by a lack of infrastructure and industry investment, significant regulatory hurdles, unclear pathways to adoption and an undervaluing of these technologies by health systems.

Since 2017, we've been helping to establish a mature and sustainable early detection community.

Our statement of intent sets out our approach:

- Accelerate early detection discovery and validation to understand the biology of cancer emergence and progression, find the markers and innovate the technology to detect early and accurately.
- Accelerate the translation of early detection approaches by working with key stakeholders across sectors and requiring line-of-sight to clinical or population impact for all research investments.
- Continue to encourage an integrated, multidisciplinary, systems approach by bringing together physical, data and social scientists and engineers alongside biomedical scientists through our international Early Detection Conference, sandpit workshops and other events.
- Work with partners to fund research that adopts a multidisciplinary approach, and which considers early and pre-cancer at a systems level.
- Engage industry by delivering networking events to build collaborations and supporting research partnerships between academic researchers and industry.
- Build capacity and develop infrastructure to grow a sustainable early detection research community.
- Support early-career and established researchers from related research fields.
- Invest in new cohorts, sample collections and model systems where there is a clear need for resource.

We will actively engage people with cancer and the public in developing interventions for early cancer detection and diagnosis, partnering with them to help improve health outcomes.

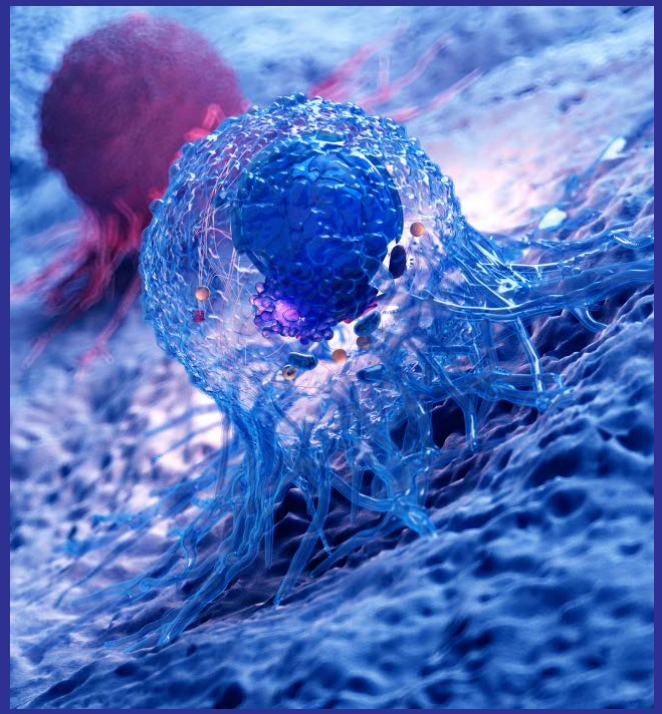
However, we know that to deliver real change in early detection and diagnosis there is a crucial need to bring together a wide cross-sectoral community to commercialise new developments, evolve health systems and change government policy.

One clear way we will do this is by delivering the recommendations of our Early Detection and Diagnosis of Cancer Roadmap.

SPOTLIGHT

EARLY DETECTION AND DIAGNOSIS OF CANCER ROADMAP

Derived from extensive consultation across the early detection and diagnosis community, our Early Detection and Diagnosis of Cancer: A Roadmap to the Future report aims to unite fragmented efforts across the UK to drive progress.



The report contains a series of recommendations grouped into four themes that address the future of research, development and healthcare:

Understanding risk and prognosis

Identifying who is at risk of developing cancer and understanding which early pre-cancerous lesions will develop into lethal disease.

Biomedical data science and systems

Unlocking NHS data for research, developing artificial intelligence risk stratification technologies and, ultimately, working towards a personal-data-driven model to inform proactive cancer detection.

Incentivising and supporting development and commercialisation

Addressing the current lack of incentives and the blockers to developing, investing in and commercialising new approaches.

Healthcare system innovation and adoption

Building on the strengths of the current health system to support validation and implementation of new approaches.

This report represents the views of the whole early detection and diagnosis ecosystem and progress will only be possible through collaborative action from many sectors.

GOING FURTHER WITH CLINICAL RESEARCH

We have a robust portfolio of clinical studies that aim to improve outcomes for people with cancer.

For example, the IMPORT LOW trial has helped to maintain the effectiveness of radiotherapy treatment for breast cancer, while minimising the risk of side effects. And for prostate cancer, the STAMPEDE trial has shown that giving abiraterone alongside hormone therapy reduces the risk of the cancer spreading and improves survival.

However, in the future we want to support more studies that not only seek to answer important clinical questions, but also enhance our understanding of biological mechanisms. We will only make substantial progress if we study areas such as tumour heterogeneity, evolution and the interplay between cancer cells and their surrounding environment to understand why treatments work in some cases, but not in others. In turn, trialists can use this growing knowledge base to create better informed clinical studies that lead to more effective and less toxic treatments.

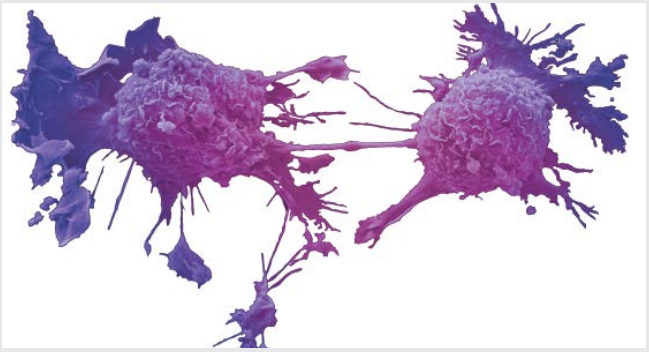
We want to gain maximum insight from the commitment that every patient makes when they take part in a clinical study, including trials, so we will need smarter and more adaptive designs. Already, we're leading the way in adopting innovative trial methodology, for example through supporting multi-arm studies such as STAMPEDE and the National Lung Matrix trial, which allow multiple clinical questions to be addressed simultaneously. But we want to see other innovative trial methodologies being used that allow the biological and clinical data generated from patients to inform the trial in real time – for example, by using emerging data on how certain biomarkers correlate with clinical response to direct how to enrich or deplete certain cohorts. This will only be possible with input from our community of highly skilled statisticians, who we will continue to support and develop.

We also want to ensure that data and samples collected and generated during studies are stored securely and made available to maximise the research value we can get from them. And we will continue to work in close partnership with patients, researchers, clinical teams and support staff in health systems across the UK to optimise and make best use of the capacity within the health systems for cancer research, particularly as we navigate recovery from the substantial impacts of the COVID-19 pandemic.

Our researchers are key to achieving these changes, so in 2022 we'll begin work with the clinical and discovery cancer research communities to shape a renewed approach to clinical studies.

This might include:

- more training to support our clinical teams to develop and deliver innovative trials that enable increased understanding of cancer mechanisms and reflect advances in discovery science
- bringing our discovery and clinical communities closer together to co-create collaborative clinical studies
- reviewing the way we fund clinical studies to ensure we have the right mechanisms to support the type of research we believe will drive progress in the future
- ensuring our funding committees have the right balance of expertise required, including clinical, translational and discovery scientists alongside expert statisticians and people affected by cancer
- adjusting the way we monitor clinical studies we support to ensure that they continue to deliver against their objectives and our strategy



UNLOCKING NEW WAYS TO TACKLE LUNG CANCER

Our large-scale longitudinal lung cancer study, TRACERx, is not a clinical trial of new treatments, but a discovery project that looks at multiple samples of tissues and cells from people with lung cancer over time to understand some of the underlying reasons why it's such a difficult disease to treat.

Discoveries made as part of TRACERx about the heterogeneity of tumours, the evolution of cancer in the body and how tumours interact with our immune system have changed our understanding of lung cancer.

These discoveries have already led to new approaches for tackling lung cancer that are currently being tested in clinical trials, including a test that may give lung cancer patients a more accurate prognosis, and treatment strategies informed by insights into the interaction between cancer and the immune system.

OUR APPROACH: NEW OPPORTUNITIES

The 2014 research strategy was the culmination of a two-year review and extensive consultation with our research and patient communities.

It was developed to be long term, recognising the journey from discovery research to impact, and that the shifts we wanted to see would take time, especially those aimed at building capacity from a low base.

In reviewing our progress since 2014, we've identified other areas where more research is needed, such as cancer prevention, and emerging areas where we see enormous potential in coming years, such as data science and therapeutic innovation.

We've explored these topics more deeply, and we'll publish fuller strategies in the coming months.

A new vision in cancer prevention research

A new strategic approach to data science

Driving therapeutic innovation

A NEW VISION IN CANCER PREVENTION RESEARCH

Research suggests that around 4 in 10 cancers could be prevented through known modifiable risk factors, such as tobacco use and obesity.*

But by understanding more about how cancer develops and translating this knowledge into more precise interventions, we could prevent many more cases of the disease.

Compared to research into cancer treatments, research into preventing cancer has been relatively under-studied, both in the UK and worldwide. The field has also been constrained by the huge scale of studies and the lengthy timelines needed to deliver definitive outcomes. These limitations have resulted in an insufficient pipeline of new investigators in the field and contributed to a market failure in delivering new cancer prevention interventions to society.

To develop a new prevention research strategy, we gathered input from more than 100 global researchers working across the research spectrum, from molecules to populations.

We also worked with our panel of people affected by cancer, who voiced strong support for the strategy, particularly highlighting the importance of addressing health inequalities.

Our prevention research strategy will be published in full in 2022. It will explain our vision and ambition in this area, identify priority research themes and establish what will be required to make progress in these areas.

The main strategic themes of the strategy will be:

- **Bringing biology to prevention**

  Harness fundamental biological insight to provide new targets for cancer prevention
- **Deepening our understanding of risk**

  Deliver a more thorough and integrated understanding of population and individual risks of developing cancer in order to develop precision prevention measures
- **Reaching further with precision prevention**

  Develop novel, disruptive preventive interventions, precisely targeted to risk factors and mechanistic pathways, through behavioural, pharmacological and immunological means
- **Understanding and addressing health inequities in cancer incidence**

  Deliver research to support a more effective and equitable public health agenda in cancer prevention
- **Building prevention research capacity and community**

  Attract new researchers and novel thinking across career stages and disciplines

This is an area of research where the opportunity to improve health is enormous and we believe there are significant opportunities to engage our world-leading discovery scientists. With our new prevention research strategy, we want to set an ambitious agenda to support a new wave of high-quality prevention research that will have impact for decades to come.

* Brown, K. et al. The fraction of cancer attributable to modifiable risk factors in England, Wales, Scotland, Northern Ireland, and the United Kingdom in 2015. British Journal of Cancer 118, 1130-1141 (2018)

FINDING RISK FACTORS THAT CAN BE CHANGED

Through the Integrated Cancer Epidemiology Programme, our researchers in Bristol are combining large-scale population studies with genetic, metabolomic and epigenetic technologies to understand causal risk factors, mechanistic targets and predictive biomarkers in a variety of cancers. They are particularly looking for factors that could be addressed to reduce cancer risk, such as lifestyle and diet.

In the past five years, the researchers have developed studies using cutting-edge statistical methods and genetic data from hundreds of thousands of people to provide high-quality evidence on the causes and progression of nine cancer types. For example, in a genetic study they found strong evidence to suggest that women who take statins in the long term could be less likely to develop ovarian cancer. This opens the possibility of repurposing a cheap drug to help prevent ovarian cancer, especially in women who are at a higher risk.

A NEW STRATEGIC APPROACH TO DATA SCIENCE

Already, data science is helping us gain insights into cancer biology, prevention, detection and therapies that will lay the foundations for improvements in patient outcomes in the future.

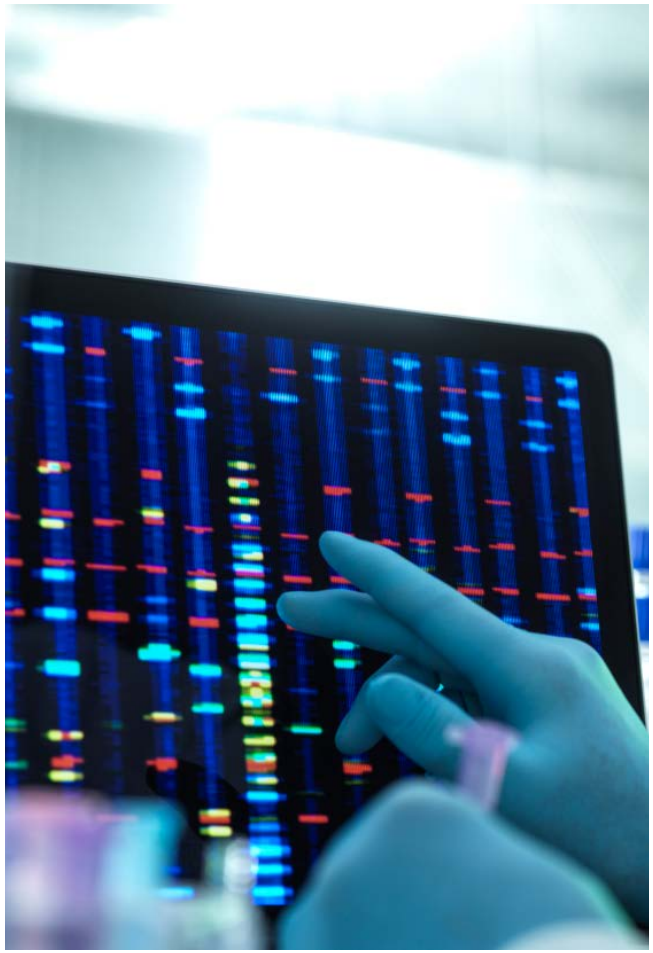
So far, we have taken a reactive, project-by-project approach to supporting big data in research. However, as the leading funder of cancer research in the UK, we are in a unique position to influence the whole data lifecycle.

We can set standards for data generation and storage, fund research that uses data to explore cancer questions, and bring in the commercial capital to translate promising assets. And we can also help patients and the public understand the value of their data and how they are protected in research.

There are many areas of cancer research to which data could be applied. For example, drug discovery driven by artificial intelligence could hold the key to new, less toxic treatments for children and young people with cancer, while data could help document the longer-term health complications of survivors of childhood cancer. Data-enabled research could also transform our ability to prevent cancers and detect them earlier through identifying patterns across disparate data types to identify those at highest risk of the disease.

Now we are developing our first research data strategy to set out how we intend to maximise the impact of our research data. We are consulting with the wider research community and patient groups, including identifying the cancer-related challenges that might benefit the most from a data-centric approach.

Our work has already begun to create the appropriate research environments, culture, support and tools to facilitate timely, community-minded, well-informed, transparent, sustainable and inclusive use of research data with equal benefits across all society. We believe this work will ultimately unleash the enormous potential of data science and advanced analytics, including artificial intelligence, to help discover better ways to prevent, detect and treat cancer.



The new strategy will be published in 2022. It will set out how we will:

- realise the potential of data science and advanced analytics through the development of exemplar research proposals for ambitious programmes
- enable secondary use of data by researchers through an overhaul of our data-sharing policies, best practice for consenting, funding selection criteria, award conditions etc. We will also make our research datasets more findable and accessible to the wider research community through the creation of data catalogues
- identify and help to meet the data science training needs and career support of our research community and beyond, and work to ensure diversity and sustainability is built into the strategy
- ensure the rights and interests of patients are respected by defining best practice for how intentions are communicated to them and how data is handled
- establish a data advisory board, including people affected by cancer, for expert independent advice
- work with partners to align efforts and add value to the data ecosystem for cancer. This will include working with the Government to influence policymaking on research data and expanding the involvement of patients and the public in our data science

> “Advances in machine learning and AI can revolutionise early diagnosis and detection. Now is the time to plan how we will use big data wisely and fairly”
>
> Professor Mihaela van der Schaar, University of Cambridge

DRIVING THERAPEUTIC INNOVATION

Discovery and clinical research will only bring benefit to patients and society if discoveries are translated into treatments and interventions that can be deployed in the UK's health systems.

At present, not enough of our world-leading research is progressing from the lab to the clinic.

We know that the pathway to novel therapeutic innovation is difficult on multiple fronts, from the challenge of identifying and validating relevant therapeutic targets, to the demanding technical hurdles in attempting to modulate target activity, to the scale of resource required to create meaningful patient impact.

Our long-term investment in drug discovery and development has helped to bring temozolomide, abiraterone and rucaparib to the market, and there is currently a pipeline of potential therapies at various stages of clinical development.

Since 2014, we have driven forward therapeutic discovery through:

- funding substantial programmes of work in key locations across the UK with a strong focus on engaging with our research network
- leveraging funding and in-kind resource through alliances with commercial partners, such as AstraZeneca, Merck, Bristol Myers Squibb, Astex and Ono Pharmaceutical
- supporting the creation of spin-out companies from our science and drug discovery projects, for example iOnctura and Artios

However, we must continue to strive for an environment where more science is translated more rapidly into prevention measures, diagnostics and treatments for people affected by cancer.

Following external consultation and review of our therapeutic innovation activities, we've set out to create an ambitious new organisation that combines our drug discovery expertise and capabilities – some 200 drug discovery scientists – under a single leadership team operating with a single portfolio and strategy. We will formally launch this initiative in 2022, with a vision to:

- engage with world-leading discovery and translational science, not only through our institutes and the local ecosystems we're embedded in, but also more widely. By collaborating with a greater critical mass and range of expertise in drug discovery, we'll be able to focus on deep biology and validation, adding great insight to clinical positioning strategies for highly novel approaches. In support of this, we established a Therapeutic Catalyst funding scheme in 2021
- build differentiated capabilities and technologies to address challenging targets and novel biology
- diversify therapeutic platforms beyond small molecule and antibody-based approaches
- create seamless integration with our Centre for Drug Development and clinical network to enable pre-clinical projects to be expedited into clinical trials
- partner in innovative ways with biopharma and venture capital investors to bring their capacity and capability where it's needed to attract increased leverage for larger scale activities

We'll also support innovations in cancer through the process of commercialisation, including supporting researchers to secure intellectual property for their discoveries and creating spin-out companies to develop better cancer tests, treatments and interventions.

Our aim is to create a sustainable pipeline of new prevention measures, diagnostics and treatments with the potential for profound impact on people with cancer.

THE STORY OF RUCAPARIB

The PARP inhibitor rucaparib was developed at our Drug Discovery Unit in Newcastle in the 1990s. Experiments suggested that inhibiting the DNA repair enzyme PARP made cancer cells more sensitive to DNA damaging agents. This promising work led to a partnership with Agouron Pharmaceuticals (later bought by a subsidiary of Pfizer) to develop rucaparib. We then sponsored a phase 1 trial for the drug, which showed it was safe when used alone, but caused too many side effects when combined with chemotherapy.

Around this time, research was revealing that BRCA1 and BRCA2 genes encode DNA repair proteins, suggesting that people with germline mutations in a BRCA gene may harbour cancers that could be particularly sensitive to a PARP inhibitor. Phase 2 and 3 trials confirmed the effectiveness of rucaparib against BRCA-mutated tumours and the drug gained FDA approval in 2016 as a treatment for ovarian cancer. It's now one of four PARP inhibitors with FDA approval that are helping to treat people with breast, ovarian, prostate and pancreatic cancer.

The story of rucaparib shows how long it can take to get a drug from early discovery work through to trials and then approval for use. Through our new organisation, we will strive to make this process much faster.

OUR ENABLERS

DRIVE INNOVATION

We will proactively drive translation and innovation to achieve patient benefit.

We will:

- create a culture where translation and commercialisation are explicitly valued through incentives, reward and recognition in review processes, so that we maximise the chance of innovations from our portfolio being picked up and progressed to market through partnership with industry and investors
- secure funding where necessary to bridge gaps in our translational pipeline and work with a diverse range of partners to help us pursue a greater number of projects and accelerate those that progress
- drive a therapeutic innovation strategy that diversifies our portfolio beyond classic small molecules to advanced biotherapeutics and create more opportunities to progress medtech, digital and data-based assets
- evolve our research data strategy to ensure we incentivise and support data-sharing and use across the scientific community

BUILD TRANSFORMATIVE PARTNERSHIPS

Many organisations around the world share our mission to beat cancer. We already work with more than 120 partners and philanthropists in the UK and around the world and we will continue to build transformative partnerships to maximise funds, capability, capacity, networks and expertise to advance our mission and optimise impact.

We will:

- build and maintain international research partnerships to accelerate our strategy – for example by bringing in a greater diversity of partners to sustain the long-term future of Cancer Grand Challenges
- partner with cancer charities and other medical research funders to align efforts and leverage investment in strategic areas and infrastructure
- partner with industry across the drug, data, diagnostics and devices sectors, where it allows us to better address a scientific question or drive progress towards health benefit more efficiently. For example, we will seek to maximise the discovery science that can take place around industry-supported trials, and the samples and data they generate
- form new cross-sector consortia – of researchers, research institutes, health systems, businesses, people with cancer and the public – to drive shared strategic priorities, such as the early detection and diagnosis of cancer
- develop partnerships to address cancer risk and prevention in areas where there are common mechanisms, for example in obesity
- maintain and grow our close working partnerships with universities and healthcare services that deliver and support our research and its implementation to benefit those affected by cancer

CREATE A POSITIVE RESEARCH ENVIRONMENT AND CULTURE

We will create sustainable and equitable research environments that foster access to research technologies, collaboration and innovation.

We will:

- make our investments in research technologies and expertise more accessible to our researchers in our wider community
- support the networking and continual development of our research community and foster an environment where skills and facilities are shared
- develop a robust policy and campaigning position to help shape the wider research ecosystem, sharing and insisting on best practice in research management, governance and integrity. This is vital if we are to generate the best, most robust research and to maintain the trust of the public
- further deliver on our relentless commitment to remove bullying and harassment from research environments
- work with our partners and our research community to drive more environmentally sustainable research practices

ACKNOWLEDGEMENTS

With thanks to members of the research community and people affected by cancer who provided their time, insights and perspectives to help shape this research strategy.

Explore our organisational strategy at cruk.org/our-strategy

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Together we will beat cancer