BRISTOL CANCER

a multidisciplinary research community dedicated to finding new breakthroughs against cancer
Cancer research at Bristol received over £19 million in funding from UK Research Councils and other funders in 2020-2021, supporting exploratory work in the prevention, early detection, and treatment of this deadly disease. Our research spans across areas of expertise including cancer biology, epidemiology, engineering, physics and clinical work. This interdisciplinarity has made Bristol Cancer an international leader in the field – an achievement we are justifiably proud of and continue to support through our University Cancer Research Fund. Between 2018-2022 this fund has supported 31 early- stage projects by Bristol researchers. These exploratory studies are critical to attracting additional funding for larger and more ambitious projects that contribute to our ground-breaking understanding of how cancer works, and how we can best support those who suffer from it. Bristol Cancer continues to grow and thrive.

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Introduction

Bristol cancer researchers are a vibrant cross-disciplinary community combining expertise from scientists at the University of Bristol and clinical researchers at University Hospitals Bristol and Weston NHS Foundation Trust (UHBW) and North Bristol NHS Trust (NBT). Together, they build on the long tradition of significant contribution to medical science in Bristol, from Sir Michael Epstein, the discoverer of the Epstein-Barr virus, the first described cancer virus in humans, to the Avon Longitudinal Study of Parents and Children (ALSPAC), collecting data on 14,500 families to further health research, and enrolling over 400,000 men in the CAP / ProtecT trials of prostate cancer screening and treatment.

We have the infrastructure to deliver world-leading research across cancer and a number of clinical areas, such as the National Institute for Health and Care Research (NIHR) Bristol Biomedical Research Centre (BRC) conducting innovative translational medical science research to drive through improvements in health and healthcare; the Bristol Centre for Surgical Research evaluating novel surgical approaches and surgical trials in cancer; the NIHR Applied Research Collaboration West (ARC West) applying health research and implementing research evidence to improve health and healthcare across the West of England; the NIHR Bristol Clinical Research Facility (CRF) which brings together early phase translational and experimental medicine research studies with a focus on cancer and immunity-based treatments; and the NIHR Academic Health Science Centre, a regional partnership bringing together expertise from universities and NHS organisations to improve health and care services by translating early scientific research and discoveries into benefits for patients.

There have been many advances in our understanding of cancer biology, with a concurrent expansion of drugs that might target abnormalities in cancer cells. The Clinical Trials Unit based at Bristol Haematology and Oncology Centre recruits cancer patients to over 100 trials across different tumour types; they aim to double this number over the next 5 -10 years to enable access for our patients to the most promising drugs. The Cancer Research UK Integrative Cancer Epidemiology Programme (ICEP) combines cutting-edge genomic technologies and large-scale bioinformatic platforms to establish causally relevant cancer risk-factors and identify novel molecular, predictive biomarkers and chemoprevention agents.

With the help of Bristol and Weston Hospitals Charity and North Bristol Trust’s Southmead Hospital Charity, we are aiming to fund the next generation of clinical cancer researchers to build on this success.

The cancer community is determined to further expand and develop cancer research in Bristol, leveraging our strengths in population health science, clinical trials, cancer cell biology, surgical and health technology innovation, and health services research. In addition to recruiting and developing top cancer researchers including clinical academic trainees, we will address healthcare inequalities, continue to build interactions with cancer patient networks to develop research priorities, and grow our cross-cutting research across fields of expertise including chemistry, physics, engineering and health data science with a view to achieving breakthroughs that might not come within a single field of research.

A significant strength of Bristol is the coherent cancer community, with a leadership group made up of researchers at different career stages and from a broad range of expertise who interact to cross-fertilise research ideas and develop novel insights. These are exciting times for cancer research, with both the University of Bristol and NHS partners supporting this ambitious vision for increasing cross-disciplinary research and partnership. We are proud of the achievements of the Bristol Cancer community so far and look forward to further ground-breaking work by our colleagues, some of whom we introduce within this publication.

Prof Anne Ridley FMedSci FRS
Professor
University of Bristol
Co-Lead Bristol Cancer Network

Prof Richard Martin
Professor of Clinical Epidemiology
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Dr Helen Winter
Consultant Medical Oncologist
Bristol Cancer Institute UHBW;
Clinical Director, Somerset, Wiltshire;
Avon and Gloucestershire Cancer Alliance

Reducing the burden of cancer through prevention and early diagnosis

Previous work by Richard Martin, Professor of Clinical Epidemiology, and Caroline Relton, Professor of Epigenetic Epidemiology, has shown that lifestyle changes and modification of certain risk factors can have dramatic effects on cancer prevention. Their research distinguishes between risk factors that are possible targets for therapeutic or behavioural interventions (including lifestyle and metabolic factors) and biomarkers that can predict who may be at risk of developing the disease.

They now lead the Integrative Cancer Epidemiology Programme (ICEP), a major 10-year programme funded by Cancer Research UK, to identify modifiable risk factors for developing cancer and gene targets that could be exploited for drug prevention; characterise the interaction between genes and environmental factors in the development of cancer; and isolate blood-based ‘omic biomarkers for cancer risk prediction. They particularly focus on the common cancers: bowel, brain, prostate, breast, and lung, as well as kidney, ovarian, endometrial and head and neck cancers, accounting for well over half of all new cancer cases annually.

ICEP is hosted by the University of Bristol, in collaboration with the International Agency for Research on Cancer (ARC, Lyon, France) and McGill University (Montreal, Canada). Other international links include the Nord-Trøndelag Health Study, one of the largest longitudinal population health studies ever performed, based in Norway.

Building on the success of the CAP and ProtecT trials led by Professors Martin and Donovan (see next page), Professors Martin and Relton are also developing new early cancer detection tools to address cancer mortality by finding cancer at a stage when it is still easily curable.

https://www.bristol.ac.uk/integrative-epidemiology/programmes/icep/

The CAP and ProtecT trials

The CAP trial (Cluster randomised triAl of PSA testing for Prostate cancer) is the largest trial of prostate cancer screening ever, addressing the controversial question as to whether a routine single PSA (prostate specific antigen) test can reduce deaths from prostate cancer.

Almost 409,000 men without known prostate cancer were either invited for a single PSA blood test or nothing, referred to as NHS standard care. Forty percent of the men invited to the blood test had this done, of whom around 4,700 had or later developed prostate cancer, compared to approximately 3,400 in the control group who developed prostate cancer over the 10-year follow-up period. During this period, there was no difference in the rate of men who died from prostate cancer, but longer studies are ongoing to see whether differences emerge as the treatment of prostate cancer has also become more effective over this timeframe.

Embedded within the CAP trial was the ProtecT (Prostate Testing for Cancer and Treatment) trial, looking at the best treatment for those prostate cancers detected within the CAP trial, enrolling over 3,000 men with early prostate cancer into the three treatment arms: surgery, radiotherapy, and surveillance (with further treatment if required), showing that surveillance is as effective as surgery or radiotherapy in preventing prostate cancer deaths, potentially saving thousands of men from life-changing treatment consequences.

Bowel cancer [also known as colorectal cancer (CRC)] remains the second highest cause of cancer mortality in the UK. Research in Bristol focuses on understanding the early biology of CRC with the aim of identifying novel approaches for both the prevention and treatment of colorectal cancer.

The team in Bristol have focused on cancer prevention for a number of years contributing to institutions such as the National Health Service (NHS), the National Institutes of Health (USA) and the Mayo Clinic (USA) encouraging people to eat a high fibre diet to reduce the risk of bowel cancer. The University of Bristol’s Colorectal Tumour Biology (CTB) group, led by Professor Ann Williams, continues to participate in international clinical prevention trials assessing the use of aspirin in people at increased risk of developing bowel cancer (CAPP3).

Currently the CTB group is focused on two areas of research: in collaboration with Mr Adam Chambers (see page 8) they are investigating the role of BCL-3/NF-kB signalling on stem cell plasticity and therapeutic resistance; in collaboration with Dr Emma Vincent (see page 21), they are studying the effect of non-steroidal anti-inflammatory drugs (NSAIDs) including aspirin and 5-ASA on cancer metabolism, identifying novel metabolic vulnerabilities that can be exploited both for the prevention and treatment of CRC.

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Understanding mechanisms of therapeutic resistance in colorectal cancer

Colon and rectal cancers (the two types of bowel cancer) are often treated with anti-cancer therapies designed to shrink the tumour and reduce the risk of recurrence after surgery. There is considerable variation in how tumours respond to these therapies. Therapy response can often dictate further management of the cancer, including how a tumour might be managed surgically. Therefore, understanding the biology underlying therapy response/resistance is critical in improving survival/cancer outcomes and management options for patients.

The research carried out by Mr Adam Chambers focuses on how inflammatory signalling pathways such as BCL-3 and NF-kB contribute to therapy resistance in colorectal cancer. As a colorectal surgeon, Mr Chambers has set-up a study (SectR) to collect blood and tissue samples for analysis in the lab; these laboratory findings can then be translated across to clinical samples. Several novel techniques have been introduced to the wider Colorectal Tumour Biology (CTB) group (see page 7) such as ultra-low pass whole genome sequencing (a DNA-sequencing technology used to detect genetic variation within the genome), ATAC-See and ATAC-Seq, which enable the analysis of small pieces of DNA that are released into a person’s blood by tumour cells as they die (known as circulating free DNA or ctDNA). The use of ctDNA focuses on the measurement therapeutic response, but the techniques also help to determine how changes to chromatin compaction alter therapy response in rectal cancer samples. These data support other findings from the group showing that the mechanism of action of BCL-3 may be through driving changes to chromatin state leading to the downstream effects observed in transcriptional regulation and the DNA damage response.

Through collaboration with clinicians at University Hospitals Bristol and Weston NHS Foundation Trust, the group has published data regarding the changing incidence of early-onset colorectal cancer. This work will also make use of the novel assays on ctDNA to elucidate differences in biology between early and late onset sporadic colorectal cancers.

https://www.bristol.ac.uk/people/person/Adam%20C-Chambers-62e0c87e-d883-423f-9c64-a1cacf1677e0/

- Chambers AC et al. (2022). BCL-3 loss sensitises colorectal cancer cells to DNA damage by targeting homologous recombination. DNA Repair.
- Chambers AC et al. (submitted). BCL-3 is a critical mediator of colorectal cancer apoptosis through repressing BIM expression.
**In-silico** calculations of DNA damage for a better understanding of the radiobiological effectiveness of radiotherapy treatments

Around half of all cancer patients have some form of radiotherapy included in their treatment management. A significant challenge with external beam radiotherapy is that the beam deposits doses in all traversed tissue and thus damages healthy tissue as well. Damage to normal tissues can lead to unwanted side effects which negatively impact patients’ quality of life. In brachytherapy and radionuclide therapy, radiation sources are placed directly inside the body such that the radiation dose is deposited locally, inside the tumour, and does less damage to the healthy tissue.

In the Bristol Particle Physics group, researchers are using computational algorithms known as the Monte Carlo methods, developed to calculate the deposited energy in particle detectors, to calculate the deposited energy in DNA during irradiation and how much of it is damaged during the process. These models can improve our understanding of how DNA damage occurs.

The team around Professor Jaap Velthuis is mainly focusing on the evaluation of the effectiveness of α-particle-based therapies by investigating in-silico (experimentation performed by a computer) the distribution and complexity of radiation induced DNA damage in these treatments. The high linear energy transfer of α-particles causes more complex DNA damage which is harder for the cell to repair. As a result, the α-particles do a lot of damage to the DNA. Furthermore, α-particles have a limited range in the body and thus will only damage the cells in the tumour. This work will lead to a better understanding of novel treatments and allow the comparison of the effectiveness of different treatment modalities.

https://www.bristol.ac.uk/people/person/Jaap-Velthuis-9847498a-837b-4212-bdc0-5fe5230c9325/

- Pritchard JL et al. (2020). High-resolution MLC leaf position measurement with a large area MAPS. IEEE Transactions on Radiation and Plasma Medical Sciences.

**Brain cancer research: accelerating discovery and clinical applicability**

Since the early 1990s the incidence of cancers of the brain, central nervous system and intracranial tumours has increased by almost a third. Primary brain tumours are the biggest cancer killer of children and people under 40. In terms of the numbers of life years lost, it is the most fatal of all cancers.

The University of Bristol Brain Tumour Research Centre led by Kathreena Kurian, Professor of Neuropathology, works across complementary areas of research, linking Bristol’s ground-breaking research in cancer epidemiology and population health with molecular biology and drug delivery. The centre aims to discover novel risk factors, biomarkers of progression, and drug targets for brain cancer using population health data; use in vitro models and clinical biobanks to screen and validate targets using machine learning; and translate work to in vivo with direct drug delivery into the brain cancer using nanoparticles and nanocarriers.

To date, pre-clinical model systems in brain cancer fail to predict efficacy and adverse effects of novel compounds when tested in clinical trials. This is compounded in the case of brain cancer by problems with drug delivery to the brain cancer, which is hidden behind the blood-brain barrier. Overall, the chance of success from target identification to the approval of a new drug is around four percent, at huge cost. Using world-leading population health expertise in Bristol to select genetically supported targets could double success at 25 percent lower costs. In collaboration with industry and other research partners, validation of targets and testing direct delivery of these to the brain could revolutionise our treatment of brain cancer.

https://www.bristol.ac.uk/clinical-sciences/research/neurosciences/research/brain-tumour/

Harnessing the power of healthy tissue to contain tumour growth

It is becoming increasingly clear that the communication between tumour cells and surrounding healthy cells plays an important role in tumour growth. Recent efforts in cancer research aim at better understanding the nature and impact of this bidirectional communication to identify novel anticancer strategies.

Eugenia Piddini, Professorial Research Fellow in Cell Biology, uses mammalian cell culture models and Drosophila intestinal tumours to model the early stages of tumorigenesis and to investigate how communication between tumours and healthy cells impacts on tumour growth.

Using the Drosophila fruit fly, a very powerful genetic model organism to study tumorigenesis, the Piddini group have shown that tumour cells kill surrounding normal host cells, a phenomenon known as “tumour host cell competition”. Her team has further shown that this process fuels tumour growth, as it allows tumour cells to clear space that they can expand into. Indeed, the Piddini group have been able to contain growth of these intestinal tumours by protecting healthy cells from cell competition and from being killed by the tumour.

The Piddini group continues to investigate the competition between tumour and host cells to identify the molecular mechanisms that allow tumour cells and healthy cells to compete. Their aim is to identify molecular interventions that by modulating cell competition help to contain tumour growth. This could help in the design of a new class of anticancer treatments that exploit and bolster the ability of healthy cells surrounding the tumour to contain tumour growth. This would be a complementary strategy to traditional anti-cancer therapies that focus instead on killing tumour cells directly.

https://piddinilab.wordpress.com/

Chemotherapy often causes unwanted side effects by drugs being delivered throughout the body, rather than just targeting the cancer. Researchers at the University of Bristol are exploring how smart delivery vehicles (nanoparticles) could be used to treat a variety of cancers, from leukaemia to brain tumours, by carrying drugs directly to the cancer while avoiding the surrounding healthy cells.

The University of Bristol provides a unique cross-disciplinary environment that brings together clinical researchers, chemists, bioengineers, biologists and engineers to design the nanoparticles of tomorrow. For example, Sabine Hauert is Associate Professor in Swarm Engineering; a ‘swarm engineer’, her group builds new computational models to understand the behaviour of trillions of nanoparticles in the body when their design is subtly changed.

There are many ways to design nanoparticles, some with molecules to recognise cancer cells, some using materials that react to lasers or magnetic fields to release anti-cancer drugs or heat to kill cancer cells. Nanoparticles could potentially be made specific for different tumour types, offering new therapeutic avenues. Nanoparticles can also “fight-up” in various ways, which is helpful to locate cancers in a non-invasive way, or to assess the response to treatment.

Dr Hauert’s models are helping clinicians in Bristol understand which nanoparticle designs will give rise to the most effective treatments, for example, by making sure that all the cancer cells in a tumour receive the optimal drug dose. Data generated from these simulations are currently being used in conjunction with machine learning to automatically design nanoparticles for different tumour scenarios. Her team is currently building a ‘tumour-on-a-chip’ device using 3D printing to test her models using real nanoparticles under the microscope. She is also working with bioengineers to understand what the first in-human clinical trials of nanoswarms for cancer treatment might look like.

http://hauertlab.com


Dr Claire Perks is an Associate Professor in Tumour Cell Biology in Translational Health Sciences in Bristol Medical School. Her team is based in the Learning and Research Building at Southmead Hospital, which facilitates their collaborations with clinical colleagues that specialise in breast, urological and colorectal cancers. With the increasing prevalence of obesity, patients in Western societies are now likely to present with co-morbid conditions such as diabetes. Dr Perks’ laboratory pursues collaborative multi-disciplinary research projects to delineate the impact of altered metabolic conditions on cancer, to determine ways in which risk and progression can be ameliorated and treatment optimised. They have a particular interest in insulin-like growth factors that are complex fundamental, nutritionally dependent regulators of growth and metabolism and together with insulin, have been increasingly associated with cancers linked to a Western diet and lifestyle. The team performs mechanistic studies using cell lines to understand the molecular processes underpinning a range of phenotypes important for tumour development including proliferation, survival, migration, and invasion. The team also plays an integral role in clinical studies, through analysis of human samples, including tissue and blood. Their overall aim is to identify better and more effective ways of treating patients and the work may lead to implementing interventions to prevent the cancer from developing. It is also hoped that this work will highlight the negative impact that obesity/type 2 diabetes can have on how cancers develop and respond to treatment. This may empower people to take positive approaches to tackling obesity/type 2 diabetes to benefit from the improved health that could be achieved.

https://www.bristol.ac.uk/translational-health-sciences/research/imag/

Improving outcomes for women having oncoplastic and reconstructive surgery for breast cancer

Over 55,000 women every year are diagnosed with breast cancer in the UK and despite improvements in treatment, almost 40% of these will require surgery to remove the whole breast (mastectomy). Having a mastectomy can dramatically affect women’s well-being and breast reconstruction is routinely offered to address this.

Decision-making for breast reconstruction, however, is complex. This is because several different procedures can be performed, and women need detailed and accurate information about the short and long-term outcomes of different operations so they can make an informed decision about surgery. Such information is currently lacking.

Over the last decade, Shelley Potter, Associate Professor of Oncoplastic Breast Surgery, has been working to establish a much-needed evidence base for reconstructive breast surgery. She leads research into the outcomes of implant-based breast reconstruction and studies to determine whether it is possible to use oncoplastic breast conserving surgery, operations that combine removing the breast cancer with plastic surgical procedures to rebuild or reshape the breast, to avoid the need for mastectomy. Her work is funded by the National Institute of Health and Care Research (NIHR), the Royal College of Surgeons, Association of Breast Surgery and the Bristol and Weston Hospitals Charity.

Miss Potter also currently leads the NIHR-funded Brighter Study which is using routinely collected hospital record data and questionnaires to investigate the long-term clinical and patient-reported outcomes of different approaches to breast reconstruction. This internationally novel work will help women make more informed decisions about breast reconstruction in the future.

https://www.bristol.ac.uk/population-health-sciences/centres/surgical-research/

- Sewart E et al. (2022). The impact of radiotherapy on patient-reported outcomes of immediate implant-based breast reconstruction with and without mesh. Annals of Surgery;
- Potter S et al. (2020). Therapeutic mammoplasty is a safe and effective alternative to mastectomy with or without immediate breast reconstruction. British Journal of Surgery.

Left: Performing reconstructive breast surgery needs to be an informed decision. Right: Miss Shelley Potter.
Understanding cancer metastases to develop new treatments

If a cancer was detected before it had spread, it could be treated more effectively, and the patient would have a much higher chance of being cured. However, if a cancer has spread from organ of origin to other parts of the body, for example bone, brain or lung, then it becomes more difficult to treat and patients are rarely cured.

Anne Ridley FRS, Professor of Cell Biology, studies how prostate and breast cancer cells spread and form secondary tumours, known as metastases. In order to spread, cancer cells first detach from the tumour, then enter blood vessels and circulate in the blood stream. If they then attach to and migrate through the blood vessel wall in a different tissue, they may grow there to form a metastasis. Professor Ridley has shown that prostate and breast cancer cells need to change their shape to move through tissues, and to attach to blood vessels. She has also identified several molecules on the surface and inside of cancer cells that are needed for the cells to attach to blood vessel walls.

For some of these molecules, therapeutic chemicals known to reduce their activity already exist. Professor Ridley’s group is currently testing some of these chemicals to see if they could be used to treat patients with prostate or breast cancer in future. This type of treatment is particularly important for patients with aggressive cancers that are likely to metastasise early and, if successful, could lead to treatments that prevent or reduce cancer metastases and thus increased cure rates for prostate, breast, and other cancers.

https://www.bristol.ac.uk/people/person/Anne-Ridley-68d1b7e-4a1b-4cb-4b86-93cc-d4908d201c71/

Turning cancer’s quirks into its vulnerabilities

Cancer cells are biologically different from normal cells. Despite these differences, many current anti-cancer therapies are unselective, meaning they kill both cancer and normal cells equally. This lack of selectivity is the major source of treatment side effects in patients.

Dr Siang Koh’s laboratory aims to address this by developing cancer-specific treatment strategies. They study cellular abnormalities found in cancer and use this knowledge to identify drugs that target them, in the hopes of discovering better and kinder treatment options that improve quality of life. The group focuses on three themes:

Understanding cancer initiation. Abnormalities such as BRCA1/2 gene mutations in cells and environmental toxins (like alcohol) have been known to increase cancer risk. The team studies how these mutations and toxins work together to turn normal cells into cancer cells. Insights will enable early cancer detection, allowing better disease management and preventative measures in high-risk patients.

Designing potent drug regimens. Small differences in chemotherapy doses will lead to severe toxicities. A potential solution is to use targeted drugs that attack cancer-specific abnormalities. They have identified how a class of drugs called ATR/CHK1 inhibitors amplify cellular stress in pancreatic cancer but not in normal tissues, leading to an ongoing drug combination trial for patients with advanced tumours.

Beating drug resistance. Cancer relapse occurs when a previously effective drug no longer works, and the group is searching to identify ways to prevent this. They have found how abnormalities in a RAS-related protein cause resistance to one class of drugs but sensitivity to another class of drugs. Findings will help clinicians select the right drug for the right patient at the right time.

https://www.bristol.ac.uk/people/person/Siarg%5C20Boon-Koh-478895-7c0d-4b86-93cc-d4908d201c71/
Exploring the role of metabolism in cancer development

Senior Lecturer in Molecular Metabolism Dr Emma Vincent’s research group is focused on the link between metabolism and cancer. They are interested in both whole body metabolism and metabolism within cells, and investigate how dysregulated metabolism influences cancer development and whether they can be targeted to prevent or treat the disease.

One area of interest looks at why people with metabolic diseases, like obesity and type 2 diabetes, are at an increased risk of cancer. Given the dramatically increasing prevalence of metabolic disease, the associated elevated cancer risk needs to be investigated. They mainly focus on colorectal cancer (also known as large bowel cancer) as it has been shown to be caused by obesity. They study how having a metabolic disease causes changes to the body’s cells and how this might drive colorectal cancer development. The group are particularly interested in colorectal cancer prevention and whether losing weight or adhering to a particular diet might reduce colorectal cancer risk.

The group take an interdisciplinary approach to research, using techniques in epidemiology to guide and inform laboratory-based cell biology. For example, they analyse samples and data from randomised control trials of dietary intervention studies (e.g., a very low-calorie diet) to determine how losing weight changes the body’s cells and tissues. They use techniques in genetic epidemiology and laboratory work to determine whether these changes might protect against colorectal cancer.

Another topic of interest is investigating and understanding how metabolism is altered in colorectal cancer cells as they develop. Cancer cells must metabolise nutrients in order to support their growth and proliferation. The group are looking to understand how they do this and how this process might be targeted for cancer prevention and treatment.

https://www.bristol.ac.uk/people/person/Emma-Vincent-712bb62c-1bde-43e5-ac46-2f3493af1997/

Encouraging the immune system to increase the body’s anti-tumour activity, a process called immunotherapy, has transformed the management and outcomes for patients with advanced melanoma. The development of compounds that prevent tumours from growing, called checkpoint inhibitors, has achieved unprecedented results and changed the landscape for patients with many solid tumours. Accelerated approval and access to immunotherapy has led to areas of active research in improved patient selection and the identification of additional pathways for targeting. A collaboration between Consultant Medical Oncologist Dr Helen Winter and Chair in Translational Immunology Professor Linda Wooldridge in Bristol Veterinary School is exploring the role of a specific type of white blood cell, known as a T cell, in cancer and the impact of checkpoint inhibition. The research is looking for genes and proteins (biomarkers) that can provide more information about the cancer. Identifying these allows us to predict how effective our checkpoint inhibitors are in the treatment of metastatic melanoma patients which, in turn, helps us understand the mechanisms that resist checkpoint blockades and determine alternative approaches that would make the therapy more effective. This research collaboration explores why some patients fail to respond to immunotherapy and identifies predictive biomarker and additional pathways that may be targeted to improve response and overcome resistance.

As the Bristol lead on the Microbiome Immunotherapy Toxicity and Response Evaluation (MITRE) study, Dr Winter and colleagues are also investigating the role of the microbiome with immunotherapy treatment. This is specifically looking at the gut microbiome “signature” to see if it can predict for immune checkpoint inhibitor treatment efficacy in patients with advanced cancers.

https://www.swagcanceralliance.nhs.uk/

Contact information

If you would like to find out more, or would like to help support research into the causes, prevention and treatment of cancer, please contact:

Bristol Cancer Research Network
bristol.ac.uk/cancer

University Cancer Research Fund
bristol.ac.uk/cancer/ucrf

Bristol and Weston Hospitals Charity
bwhospitalscharity.org.uk

Southmead Hospital Charity
southmeadhospitalcharity.org.uk

Elizabeth Blackwell Institute for Health Research