



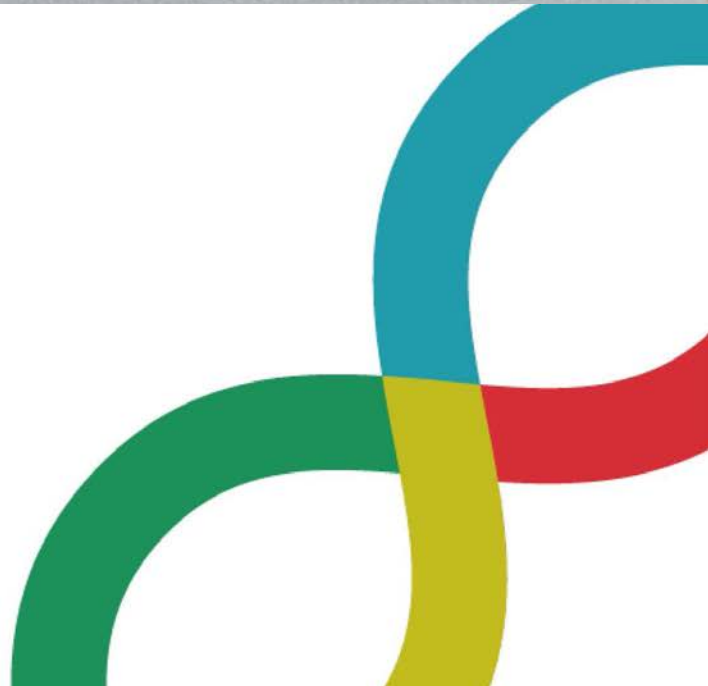
Canolfan  
Ymchwil  
Cancer  
Cymru

Wales  
Cancer  
Research  
Centre

Ymchwil Iechyd  
a Gofal Cymru  
Health and Care  
Research Wales

 Ariennir gan  
Lywodraeth Cymru  
Funded by  
Welsh Government

# 2022 - 2023 Annual report



# CONTENTS

<b>Page 4</b>	<b>Foreword</b>
<b>Page 8</b>	<b>Introduction</b>
<b>Page 10</b>	<b>Key highlights</b>
<b>Page 12</b>	<b>A year in the PPI Team</b>
<b>Page 16</b>	<b>Supporting research journeys</b>
<b>Page 20</b>	<b>Features</b>
<b>Page 29</b>	<b>A look to the future</b>

# FOREWORD



**The Wales Cancer Research Centre (WCRC)** is a Health and Care Research Wales funded research development infrastructure. We aim to be the front door to cancer research in Wales – providing strategic oversight and coordination, promoting cooperation between cancer researchers, institutions and stakeholders across Wales, and directly supporting research within the six priority research themes in Wales’ Cancer Research Strategy (CReSt) launched in 2022.

Our vision is for Wales to have a well-connected, high-performing cancer research community that is delivering world-leading research, impacting cancer incidence and patient outcomes both in Wales and beyond. Our mission is to grow the cancer research base in Wales, by creating a clear focus and reputation for excellence in thematic areas of strength, attracting multi-sector investment to expand research capacity and maximising research opportunities for Welsh cancer patients.

There are many examples of excellent, internationally competitive cancer research being carried out

today in Wales, across the spectrum from discovery science through to clinical trials, and population and behavioural research, and highlights are included in this report.

Our aim at the WCRC is to work with the cancer research community across Wales, build on existing strengths in cancer research with renewed focus and energy, support a growing community of researchers, and provide opportunities for Wales’ future cancer research leaders.

The WCRC’s work is underpinned and influenced by our Patient and Public Involvement (PPI) group, who have had considerable success over the last year with the launch of the Public Involvement in Research Impact Toolkit (PIRIT) which will be featured later in this report.

The WCRC cannot deliver CReSt alone, and we are working with other HCRW funded infrastructures including the Wales Cancer Bank (WCB), Wales Gene Park (WGP), the Secure Anonymised Information Linkage Databank (SAIL), and the Centre for Trials Research (CTR), along with the Welsh Government funded Wales Cancer Network

(WCN) to coordinate collective delivery of CReSt, and to ensure that patients across Wales benefit from research.

The WCRC has worked closely over the last year with many NHS and academic institutions to grow the cancer research base across Wales, and we will continue to build these key relationships and connections into the future. I am delighted to present this WCRC stakeholder report that highlights some of the careers and important research we support across Wales. Finally, I would like to thank the whole cancer research community in Wales for their support and engagement throughout the year. Diolch yn fawr iawn.

**Prof. Mererid Evans, Director**

# OUR RESEARCH IN NUMBERS

## Core metrics

Reporting period 2022/2023

**Health and Care Research Wales Infrastructure award to the WCRC**



**Direct funding awarded**  
**£975k**



**Researchers directly funded by WCRC**  
**31**

## Grants won during reporting period

Grants awarded	Led by research group	Group collaborating
Number	14	3
Value	£4.4m	£1.4m
Funding to Wales	£4.4m	£1.4m
Additional jobs created for Wales	13	1



**Number of publications by WCRC researchers**



**Number of public engagement events**



**Number of public involvement activities**



# CENTRE STRUCTURE 2022/23

## WCRC ACADEMIC LEADERSHIP



**Prof. Mererid Evans**  
Director

**Prof. Duncan Baird**  
Associate Director

**Prof. Sunil Dolwani**  
Associate Director

**Prof. Steve Knapper**  
Associate Director

### WCRC HUB TEAM



Jenni Macdougall  
Strategy



Dr Ceri Morris  
Operations

Plus ~3FTE of comms, project and admin support

### WCRC LAY RESEARCH PARTNERS



Julie Hepburn  
Lead Research Partner



Bob McAlister  
CReSt Research Partner

Plus 5 more Research Partners aligned to CReSt themes

### CREST THEME LEADS

Cohort of 12 academic leaders responsible for:

- coordinating research activity for their theme
- acting as champions for research in their area
- identifying opportunities for collective progress within and across thematic areas

### WCRC FUNDED RESEARCHERS

Cohort of researchers funded or part-funded by WCRC based at:

- Cardiff University
- Swansea University
- Bangor University
- Velindre University NHS Trust
- Cardiff and Vale University Health Board
- Swansea Bay University Health Board
- Betsi Cadwaladr University Health Board

★ Member of WCRC Senior Leadership Group

# INTRODUCTION

*“Our vision is for Wales to have a well-connected, high-performing cancer research community”*



Above: Dr Hannah Reed, WCRC funded Clinical Research Fellow, Cardiff University

Welcome to the (WCRC) stakeholder report for 2022-23. In July 2022, Wales’ first Cancer Research Strategy (CReSt) was launched, and the WCRC was given a key role to play in coordinating collective delivery across organisations and institutions in Wales.

It has been a busy year! We successfully re-bid for WCRC funding for 2023-25, revising our delivery model, thematic structure and research funding (workstreams replaced by 6 CReSt themes) and governance groups to enable effective oversight and coordination of CReSt. The WCRC also successfully bid for an extra £1m Health and Care Research Wales funding with the CReSt Catalytic award, to accelerate delivery on some key areas within CReSt, namely to increase capacity in cancer bioinformatics, cancer data and to accelerate researchers towards independent programme funding.

Our refreshed delivery model for 2023-25 has 3 strands:

- ◆ Investing in research positions along the career pathway
- ◆ Brokering collaborative and integrated working
- ◆ Delivering project work that enables research activity.

**Investing in research positions along the career pathway:** During this last year, the WCRC activities were restructured to align with CReSt and the research posts that are continuing into the 23/25 period have been realigned with the six CReSt themes, each with academic research leads to oversee each thematic area of research.

There is an ongoing recruitment drive across five organisations (Cardiff, Swansea and Bangor Universities, Cardiff & Vale University Health Board (UHB) and Velindre University NHS Trust) to recruit **15** new posts, many of which will be jointly funded between the WCRC and their hosted organisations.

These positions are varied and include lecturers, research fellows and associates, data scientists and bioinformaticians, clinical researchers and academics. Eight researchers have been appointed to date with the process underway for the remaining positions. There are another nine posts that will be recruited under the CReSt Catalytic funding, which will bring our research community to **31** for the next two years.

Some WCRC researchers from the



Above: WCRC partnerships span across Wales: Cardiff, Bangor & Swansea University, Cardiff & Vale University Health Board (UHB), Swansea Bay UHB, Betsi Cadwaladr UHB and Velindre University NHS trust

previous quinquennium are in the process of moving on to other sources of funding and continuing their careers and we are delighted that the Centre has been able to help them on their journey. In celebration of the **96** researchers that the WCRC have supported over the last 8 years, this stakeholder report showcases some of the research activity and careers that have been enabled by the WCRC and that continue to be enabled and supported.

This Stakeholder report also focuses on notable successes from the last 12 months that the WCRC has facilitated, including several ground-breaking studies: for example, see the articles on Grace McCutchan’s leading work on the YESS study, Stephanie Burnell’s advancement of organoid research, Michelle Edwards’ work on the international SERENITY study and Magda Meissner’s leadership of the QUICDNA study which has received publicity and attention across the country and USA. These examples highlight the important advances WCRC researchers are making across many of the broad themes outlined in the CReSt strategy and how they are at the forefront of innovative new cancer research across Wales.

**Brokering collaborative and integrated working:**

We are also working hard to find ways to support collaboration and interaction across Wales between researchers and institutes, and this year has seen us start to re-evaluate our research groups and find ways to bring funding opportunities proactively to researchers in Wales.

The WCRC supports multiple Multidisciplinary Research Groups (MDRGs), with most groups currently focussed on a site-specific cancer, to bring researchers from across Wales together. These have been instrumental in starting new conversations, building new collaborations and stimulating new areas of cross-cutting research.

We will continue to support the community in this way, with cross-disciplinary meetings aligned to the CReSt themes and other events designed to foster connections across the research community in Wales.

**Delivering project work that enables research activity:**

An important part of what we do is to facilitate task and finish style projects that have potential to benefit the cancer community across Wales as a whole. For example, the WCRC supported our Academic PPI Lead, Alisha Newman, and our Research Partners’ group in the development of the new Impact Tool, named PIRIT (Public Involvement in Research Impact Toolkit). PIRIT is an Impact and Tracking Tool for PPI that consists of a checklist and spreadsheet to ensure that PPI engagement is fully considered and costed in the planning stages of a study and that the engagement is recorded appropriately against the UK standards.

PIRIT was formally launched at the National Marie Curie Conference on 6 February 2023 and is now available for use in research trials free of charge. The PIRIT launch was a notable success generating widespread interest in its use. The toolkit is a great example of a PPI-led piece of work spanning two infrastructures, WCRC and Marie Curie Research Centre (MCRC) which stands to benefit the research community in Wales and beyond.

We are also looking to aid our research community by organising webinars aimed at increasing the number of applicants from Wales to funding opportunities. An example of this was our workshop in March on the MRC Clinical Academic Research Partnership (CARP) scheme, which aimed to raise the awareness of a source of funding that could benefit clinical cancer researchers.

**Update on the WCRC Team:**

During this report period, three new WCRC staff members started with the Hub team, including a new Operations manager, a Senior Comms Officer and an Admin Officer, and we are recruiting a Scientific Project Manager to complete the team. To highlight the different types of support the team provides the cancer community and to raise awareness of other relevant opportunities, the WCRC newsletter was refreshed recently and our new website launched in October 2022, with new website graphics and content to reflect the revised mission and aims for the Centre. We have recently started to build on our online community with an increased presence on Twitter and a new LinkedIn account which will be used to share funding opportunities, news and events and to help promote the work of our funded researchers. Our team is looking forward to continuing to build collaborations between researchers and Institutes and continuing to support the cancer community across Wales through this funding cycle.



Above: Dr Kevin Norris, WCRC funded Research Associate, Cardiff University

# KEY HIGHLIGHTS

## Launching the first all-Wales Cancer Research Strategy, CReSt

CReSt, the first all-Wales Cancer strategy, was launched in July 2022. This landmark sets out a shared direction of travel, and the document was met with support from organisations across Wales including Health Boards, Universities and the Wales Cancer Industry Forum.

Its core principles include the need for organisations to take collective responsibility for cancer research in Wales, and the importance of building depth rather than breadth to focus in areas of key research strength.

Following the strategy's development led by Health and Care Research Wales and the Wales Cancer Network, the WCRC took on the finalisation and launch of CReSt, and

is now engaging with individuals and organisations across the research community to coordinate its implementation.

You can access the strategy to see how it applies to you at: [walescancerresearchcentre.org/crest](http://walescancerresearchcentre.org/crest)

The launch of CReSt received coverage from BBC Wales (radio and online), ITV Wales (TV and online) and Wales 24/7 (online), with a potential total reach of 394,000 people across Wales. This was complemented by social media activity around the launch days, with more than 5,000 tweet impressions, and 348 Twitter video views and 222 YouTube video views of our CReSt introductory video, produced in both Welsh and English.

Mark Edwards, one of the WCRC's patient and public Research Partners based in North Wales, shared his thoughts on why CReSt matters to patients. "The value of collaboration between individuals and bodies who are active in research comes across loud and clear in the strategy. From my viewpoint, seeing how cancer research groups manage to work in concert has been inspiring. The old maxim of the whole being greater than the sum of the parts certainly applies here." You can read his article in full on [our website](#).

If you are a researcher in Wales, or your organisation supports research activity, you can stay in touch with opportunities to engage with CReSt via the WCRC website.



Moving Forward: A cancer research strategy for Wales

Wales Cancer Resear... [Analytics](#) [Edit video](#) [Share](#) [Save](#) [...](#)

### CReSt priority research themes



**Theme 1**  
Precision and mechanistic oncology

Leads: Duncan Baird, Magda Meissner



**Theme 2**  
Immuno-oncology

Leads: Awen Gallimore, Alan Parker



**Theme 3**  
Radiotherapy

Lead: James Powell



**Theme 4**  
Cancer clinical trials

Leads: Steve Knapper, Richard Adams



**Theme 5**  
Palliative and supportive oncology

Leads: Simon Noble, Anmarie Nelson



**Theme 6**  
Population health-based cancer prevention, detection, primary care and health services research

Leads: Sunil Dolwani, Kate Brain, Dyfed Huws

## Taking the CReSt strategy forward for Wales

To catalyse the implementation of CReSt, the WCRC secured additional funding from Health and Care Research Wales to accelerate areas of activity that were emerging early on in implementation discussions as being key to building a secure base for cancer research in Wales.

The first area receiving a boost of support is cancer bioinformatics, to make sure we are growing our expertise in Wales to make the most of the huge amount of data already being generated. Funding will support a mixed model of academic fellowships that pursue their own research agenda, and a bioinformatician who will support laboratories across Wales with a blend of analytical resource and training.

The second area of work focuses on unlocking cancer data. We have rich population-level data sets in Wales that are not yet being fully exploited in cancer research, and also have the opportunity to join up new data sets such as genomic data collected through the NHS with existing resources. The catalytic funding will support a data scientist with

a cancer focus to work alongside the SAIL databank, to produce insight reports and research-ready data assets that will make it easier for cancer researchers to design and implement their own studies using the data. There is also some funded time for a clinician and a technical data lead to ensure that the implementation of the Welsh Government's Genomics Delivery Plan published in 2022, as well as other national data initiatives, have strong representation from the cancer community.

Thirdly, it is important to support talented researchers in Wales to establish their own programmes of competitively funded work. Programmatic funding is essential to being able to build a cluster of activity around a single topic area, bringing the kind of focus and 'depth' of research that the CReSt strategy emphasises is key to success. Securing major grants can also open up funding and training opportunities provided by the research funder. Three scientists are receiving a boost through this award, to accelerate them towards major funding applications:

- Dr Helen Pearson at Cardiff University will build on her existing work to explore how heterogenous fibroblast populations in the tumour microenvironment affect the regulation of the PI3K/AKT signalling pathway in hard to treat (hormone resistant) prostate cancer.

- Dr Chris Staples at Bangor University is scaling up his work on identifying and validating novel cancer targets and uncovering the regulatory networks determining cancer cell chemosensitivity, using genome-wide CRISPR screening.

- Dr Carly Bliss at Cardiff University is expanding her work on anti-cancer vaccines, including exploring how adenoviral vectors used as vaccines against COVID19 could be re-purposed for use in cancer, and developing novel adenovirus vectors that are not affected by the body's pre-existing immunity.

This funding runs from 2023-25, and will complement the work WCRC is already doing to coordinate CReSt academic leadership and to facilitate collaborative working within each theme.

# A YEAR IN THE PPI TEAM

## Julie Hepburn, our Lay Lead for Patient and Public Involvement, shares her thoughts on the past year



would like to increase usage of this group, so please look at the WCRC website for more information if you are unaware of what it has to offer.

Face to Face meetings have now started to happen occasionally for us but we are currently still having our 3 monthly meetings on Teams, which works well for us most of the time and allows distant and local members to participate equally. There is also of course the need to consider whether the benefit of being face to face outweighs the compelling 'green' reasons for unnecessary travel!

This year has seen the introduction of the new CReSt structure for WCRC setting out the six priority research themes described in detail earlier in this document. We have now restructured our lay research partner (RP) links with one research partner linked to each theme, making it easier to build a strong targeted PPI/researcher relationship going forward. The research partners have now attended initial workshops with theme researchers and will be working closely with them in future. A document outlining our research partner 'Core Offer' to researchers has also recently been sent to theme leads to help them identify the areas in which we are able to offer help.

Multi Disciplinary Research Groups are currently being restructured and we will ensure that our RPs are realigned to fit into the new groups as appropriate.

The operation of the Rapid Response Group which provides PPI help quickly to researchers facing close deadlines has recently been reviewed. The results showed that although researchers and PPI members were happy with the way the group worked, we still have low numbers of researchers taking advantage of the help on offer. We

One major achievement this year has been the launch of PIRIT the PPI Planning and Impact Tool which a group of RPs, led by Alisha Newman, launched in February 2023. Further detailed information on PIRIT is included elsewhere in this report. Alisha put an enormous amount of work into this project and into all her work as the Academic Lead for our group. We will be very sad to lose her when she moves on to a new post in Bristol in July, but she hopes to continue the ongoing development of the PIRIT work alongside her new post.

Although the research partners only have a limited number of hours per year for WCRC work, we are also all involved in other aspects of cancer research which gives us a breadth of experience on which we can draw

to enhance our input for WCRC. One example of this is involvement in funding applications for related infrastructure groups and centres. Research partners contributed to bids for three research centres in Wales in the last year which will no doubt prove beneficial experience for approaching the WCRC bid for 2025 onwards.

We are currently assessing how much of our 5 year Action Plan we have already achieved, and what our priorities are for the time we have left. We plan to work with other PPI groups in our area (Experimental Cancer Medicine Centre (ECMC), School of Medicine, CTR Hub, All Wales Cancer Community, HCRW support Group) to co-ordinate work on common areas of interest such as:

- ◆ Increasing equality, diversity and inclusivity both in PPI recruitment and for participants in clinical trials
- ◆ Developing PPI training and development initiatives for early career researchers
- ◆ The role of PPI in projects concerning data and Artificial Intelligence

We look forward to continuing the provision of a helpful and effective public involvement service to researchers in the WCRC during the remainder of this funding period.



Above: Kathy Seddon (L), Public Contributor & PIRIT team member and Alisha Newman (R), WCRC academic lead for PPI

## PPI Group - helping to support our funded researchers

Research Partners are members of the public with lived experience of cancer as a patient or carer. Their main function is to help shape the WCRC's long-term research aims and interests. They also advise on the development and coordination of public involvement in research activities, working closely with many of the WCRC funded researchers.

Their core support offer is to:

1. Advise research staff on public involvement best practice, including use of the UK Standards for Public Involvement.
2. Provide a named Research Partner as a key contact for each Cancer research strategy for Wales (CReSt) work stream/theme.
3. Maintain a regular dialogue with strategic decision makers such as

WCRC Senior Leadership Group members and CReSt theme leads.

4. Help identify opportunities for meaningful patient and public involvement in strategic decision-making.

5. Contribute a public perspective through membership of WCRC strategic level groups and committees.

The WCRC have also recently established a Rapid Response Group (RRG). Involving patients and the public in funding bids for research projects is not just a 'nice-to-have'. These days, funders are keen to see evidence of public perspectives throughout the research cycle from day one. The RRG is a way for our researchers to access a group of people with experience of cancer who can respond quickly to call-

outs for input in the Health and Care Research Wales Public Involvement weekly bulletin.

The RRG provides an accelerated process to recruit patient and public members who have agreed to make themselves available to help.

The group is accessible to all WCRC funded researchers as well as all cancer researcher in Wales who would like help and guidance with PPI through contacting the Centre's Hub team.

Dr Ray Samuriwo, lecturer at the Cardiff School of Healthcare Sciences said: "Working with members of the Rapid Response Group on my grant application was a joy and a delight. I was lucky enough to work with a diverse range of people, each of whom brought their unique expertise to bear on the design of the proposed project."



"Our Research Partners have a breadth of experience in cancer research on which to draw from to enhance our input for WCRC"

Above: Bob McAlister, WCRC Lay Research Partner (PPI), Una Rennard (Right, public member) and Professor Ade Adebajo of Sheffield University (middle) at the launch of the UK Standards



## Embedding Patient and Public Involvement (PPI) in research in Wales and beyond – the SERENITY Study

A team of over fifty researchers and clinicians from across Europe are coming together to work on a €6m Horizon Europe Research and Innovations funded study to focus on the use of Antithrombotic Therapy (ATT) in end-of-life care and to help to change the decision-making processes involved with the issuing of the medication.

ATT is rarely discontinued in people with advanced cancer and can cause excess bleeding, an increased disease burden and a decrease in quality of life for cancer patients. The new study SERENITY will use various research methods to evaluate the use of ATT in patients and develop an easily accessible web-based shared decision-making tool to optimise its use at the end of life. It is hoped that this will then lead to enhanced empowerment, improved quality of life and treatment satisfaction of people with advanced cancer and their care givers.

SERENITY, will unite research teams from across 8 countries and 14 research institutions. A Cardiff University research team led by SERENITY Principal Investigator Professor Simon Noble and co-

investigators Professor Annmarie Nelson and Professor Adrian Edwards obtained over £1.1m from funders Innovate UK and will be working on SERENITY in Wales with researchers Dr Michelle Edwards, Dr Stephanie Sivell, Miss Elin Baddeley, Mr Ashley Akbari and Dr Kate Lifford.

Dr Michelle Edwards, WCRC funded research fellow for over 2 years, will be working on a qualitative element of the study to explore patients' and clinician's attitudes and experiences in relation to deprescribing ATT with another element focusing on the design and development of the shared decision-making support tool. Michelle is also the PPI lead for SERENITY along with a WCRC Research Partner, Dr Kathy Seddon

Along with Kathy, Michelle will strategically promote, manage and support public involvement in the SERENITY Study across all work packages in all countries involved in the study, they will also capture how PPI has had an impact on the research.

Michelle said: "PPI is gaining recognition both across Wales and

internationally as a vital tool that helps to ensure that healthcare systems and services are responsive to the needs and preferences of those they serve by actively involving patients and the public in decision-making processes, however PPI is unevenly implemented across Europe - we are hoping to help to improve this through the SERENITY study."

To help plan public involvement across the SERENITY work packages, Michelle has made use of the new Public Involvement in Research Impact Toolkit (PIRIT.) PIRIT was developed and launched as a result of a collaboration between the WCRC and Marie Curie Research Centre (MCRC). The free Toolkit aims to help researchers working with the public to plan meaningful involvement in research alongside helping to track and demonstrate the difference it makes.

Michelle continued "We have worked with the PIRIT tool to help us plan PPI in two Serenity work packages that are in operation and are currently tracking the impact of how we have engaged with patients and the public so far.

Over the 5-year study period we will be supporting all work package leads who are setting up future work packages to plan their PPI and encourage the use of the PIRIT tool."

At the end of the study, the SERENITY PPI team will publish their strategy and the impact of their PPI work as well as their guidance on creating a European PPI infrastructure. From their research, the team aim to develop a targeted implementation and dissemination plan to enable the use of the SERENITY shared decision-making tool across the eight countries in the study, as well as its incorporation in clinical guidelines and policies to help improve patient health communications across Europe and beyond.

Michelle has a research background in health communication, health literacy, self-management and patient involvement in treatment decision making. Her early work highlighted how health literacy was an important influence on how

patients engage in information exchange and shared decision-making in health care consultations and how patients can become more health literate and involved in decision-making through patient education, social interaction and self-directed learning.

Michelle said: "I am passionate about supporting and empowering patients to be involved in decision making about their treatment and care. Cancer treatment decisions can be complex within the context of patient's lives and the range of treatments and care options available.

It's important that patients are informed and are able to understand all the information to make a choice that they feel most comfortable with. Shared decision-making support tools can help patients develop health literacy and educate and empower them to achieve this".



## The launch of the PIRIT Toolkit

A free Public Involvement in Research Impact Toolkit (PIRIT) has been created as a result of a collaboration between WCRC and the Marie Curie Research Centre (MCRC).

The PIRIT toolkit aims to help researchers plan and track their work with the public to make sure the PPI research is impactful. PIRIT came to fruition after a review of existing tools found that none were linked to the UK Standards of Public Involvement. It consists of two pragmatic tools: the Planning Tool and the Tracking Tool.

The PIRIT tool was originally co-developed by public contributors and team members for use at the MCRC and the WCRC and was tested in three cancer-focused research studies (although it can be used in any research field); and refined in response to pilot feedback prior to its public launch.

Dr Daniella Holland-Hart and Dr Michelle Edwards, Research

Fellows co-funded by the MCRC and the WCRC, made use of the new Toolkit as part of a realist review (an investigation into why an intervention may or may not be successful.) The evidence synthesis from the review has informed the development of a grant application to a Palliative Care themed funding call for the NIHR HS&DR programme.

Daniella said: "PIRIT was used during our realist review on 'How do shared decision making approaches and patient aids influence treatment decisions for patients with advanced (non-curative) cancer?' The Tool was very useful in helping us to work together with members of the public to track their contributions including how they influenced the research throughout our study."

Michelle said: "Spending time carrying out a realist review using the PIRIT tool in collaboration with clinician and patient stakeholders has enabled us to develop a framework for a digital

intervention that patients with advanced cancer can use to better understand their cancer journey, navigate their way through cancer services, ask questions that are important to them, and keep their life preferences at the heart of their treatment and care decision-making experiences. We'd like to co-produce this intervention with patients and clinicians and for it to be tested in cancer service settings".

As the only Toolkit of its kind, PIRIT has generated considerable interest. Engagement with the research and public involvement community during PIRIT development revealed that there was demand for the resource more widely and as a result, PIRIT was officially launched for wider public use at the [Marie Curie Conference](#) in February 2023.





# SUPPORTING RESEARCH CAREER JOURNEYS

*The WCRC has funded or co-funded 96 researchers over the last eight years who have gone on to have careers in a wide breadth of cancer research. With WCRC support, many have been the recipients of large grants and scholarships, presented their research to international audiences and helped to develop better and more effective cancer treatments. We caught up with a few of them to find out about their career journey and how WCRC support has helped them along the way.*



**Dr Najmus Sahar Iqbal,**  
Consultant Clinical  
Oncologist, Velindre  
Cancer Centre

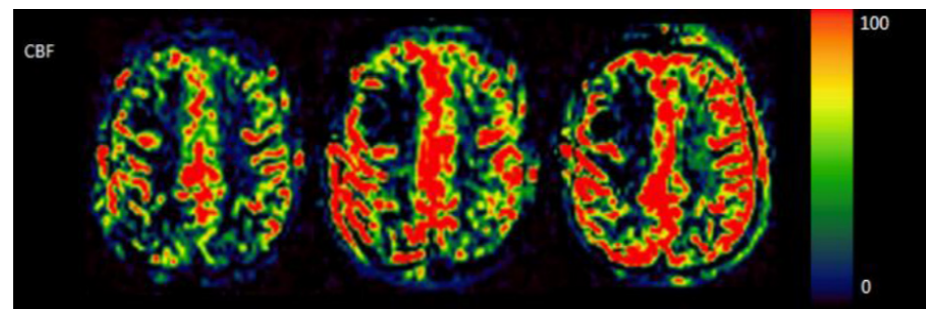
"I am a consultant clinical oncologist based in Velindre Cancer Centre specialising in neuro-oncology and lung cancer. During my specialist training, I applied for research experience. My PhD was supported by the WCRC and my research project was to study memory impairment in patients undergoing stereotactic radiosurgery (SRS) for brain metastases.

Up to 40% of patients can develop brain metastases during their cancer journey. There are a number of ways to treat brain metastases, one of the most common treatments given is called stereotactic radiosurgery which is a highly focussed way of giving radiotherapy and has the advantage of sparing most of normal brain. Despite its precision,

clinical trials have reported that up to 60% patients can develop impaired memory following this treatment.

We designed an observational study for patients undergoing SRS at Velindre Cancer Centre which was approved by Wales Research Ethics committee. Patients underwent memory testing before and after their treatment along with detailed MRI imaging at Cardiff University's Brain Research Imaging Centre (CUBRIC).

The scans were performed to study changes in blood flow, structure, metabolites and diffusion of the nerve tracts around the metastases following SRS. In addition, we studied these changes in the hippocampus which is a structure considered to be crucial in memory formation. This was the first study in the world where patients with brain metastases had imaging using the microstructural MRI scanner in CUBRIC. WCRC funded my time for research and allowed me to conduct a unique study to understand changes within the brain following SRS. With the support I have received from

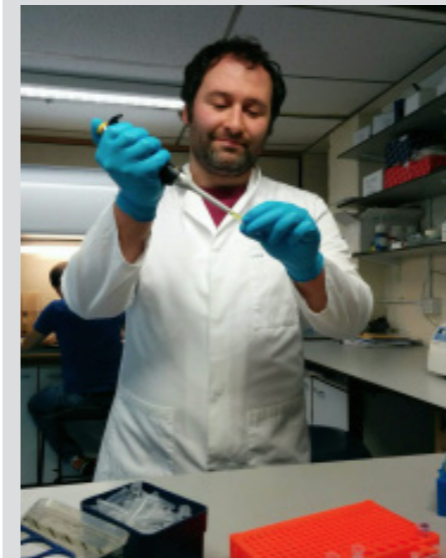


WCRC, I have presented at national and international meetings over the years including British Neuro Oncology Society Annual Meeting, International Society for Magnetic Resonance in Medicine and European Society for Radiotherapy and Oncology.

My PhD research data has led to securing significant funding from the Engineering and Physical Sciences Research Council to study oxygenation blood flow in patients with primary brain tumours and its impact on response to treatment.

We have been successful at building a collaboration with CUBRIC from the support I have received from WCRC and we plan to build this further for future studies in brain tumours."

**Below: Blood flow in the brain: red is high blood flow and blue is low blood flow. Where the tumour is present has lower blood flow which can impact how well the tumour might respond to radiotherapy. Left is before radiotherapy, middle 1 mth after radiotherapy and right is 3 mths after, showing that the cancer is lacking blood flow through out.**



**Dr Chris Staples,**  
Researcher,  
Bangor University

"I am a UKRI Future Leader Fellow working in the North-West Cancer Research Institute at Bangor University.

I began my journey in science with an undergraduate degree in Biochemistry at Queen's University, Belfast, and went on to do a PhD

with Prof Steve Keyse at Dundee University, where I studied the role of a group of cellular enzymes called phosphatases in the response to ultraviolet radiation. From there I joined the CRUK-funded laboratory of Dr Spencer Collis at the University of Sheffield, where we focused on identifying novel factors that protect the human genome from DNA damage.

In 2015, I moved to Bangor as a lecturer, in a post initially funded by the WCRC. Thanks to this initial funding, we went on to win a series of grants from North West Cancer Research and Cancer Research Wales, as well as a £1.8 million UKRI Future Leaders Fellowship.

The support from the WCRC was thus genuinely instrumental in allowing us to establish a well-staffed independent research laboratory in North Wales.

Research in our laboratory focuses on the molecular mechanisms that underpin cancer cell responses to various therapies. We are particularly interested in how

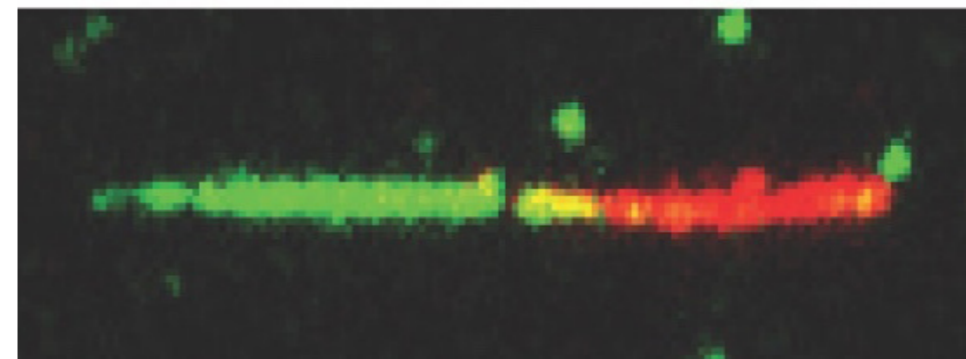
the regulation of DNA-digesting enzymes called nucleases can alter the choice of mechanism used to repair the damage caused to cancer cell DNA by certain chemotherapies. This has led us to identify novel anti-cancer drug resistance mechanisms.

We are also starting work to conduct screens that allow us to individually target every gene in the cancer cell genome, to ascertain which ones are important for resistance to therapy.

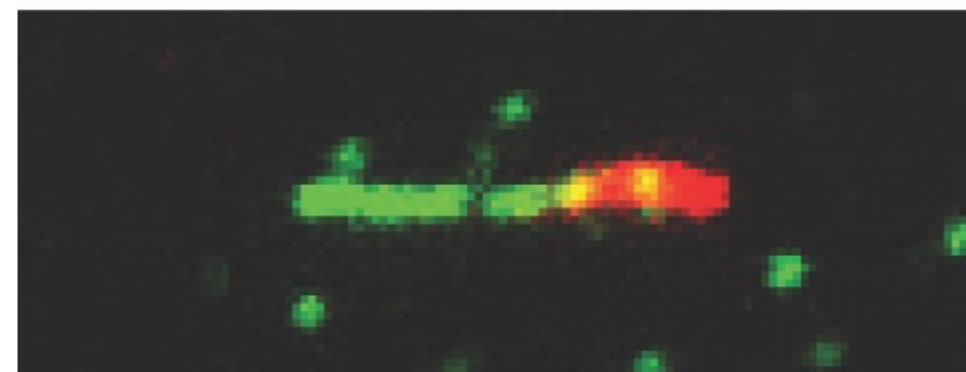
I have been very fortunate to benefit from the support of the WCRC. More recently the WCRC has generously provided funding to recruit a technician to help us work towards identifying novel cancer genetic vulnerabilities. In turn, this will help us secure additional funding to expand this work and capitalise on any findings via drug discovery initiatives, with the ultimate aim of improving patient outcomes."

*"Support from the WCRC was instrumental in allowing us to establish a well-staffed independent research laboratory in North Wales"*

## Replicating DNA



The DNA fibre assays (above) routinely performed in Chris's laboratory allow researchers to assess the impact of chemotherapeutics on DNA replication at the level of single DNA molecules.



This image shows that DNA replication is impaired in cancer cells in which a novel DNA repair protein (MRN complex interacting protein, MRNIP) has been deleted. The image shows unmodified cancer cells (top panel), cancer cells in which the MRNIP gene is deleted using CRISPR-Cas9 (bottom panel), both of which have been treated with chemotherapy. The areas of replicating DNA are shown in red.

# Supporting our researchers along the career pathway



**Dr Stephanie Smits,  
Behavioural Scientist,  
Cardiff University**

"I am a Behavioural Scientist working at Cardiff University, School of Medicine. I completed my Undergraduate degree at Cardiff University School of Psychology (2010), and then completed my PhD at Cardiff University, School of Medicine (2014). Following my PhD I went on to work on a variety of projects in different areas of cancer research, including cancer awareness and early detection. I have a passion for working on projects that involve bringing together the public, patients, health professionals and health services.

Following my PhD I worked as a Research Associate across the Health and Care Research Wales funded PRIME Centre Wales and WCRC (2015-2018). This post gave me the chance to build a portfolio of work and make connections with other researchers across Wales. Crucially, this post gave me grant writing experience on a variety of different projects.

One of the grant applications I worked on was my HCRW, Health Fellowship. The WCRC role enabled me to work on this grant, alongside other grants, whilst simultaneously

building up other key skillsets for example publications, collaboration, networking, project management and reporting to funders. The Fellowship is an opportunity for me to further develop my skills, transition towards becoming an independent researcher and help contribute to the cancer research field here in Wales.

I was awarded this prestigious award from Health and Care Research Wales in October 2018. During the Fellowship I have been applying my behavioural science expertise to explore the impact that multi-morbidity (presence of two or more long-term conditions) has on the Welsh Bowel Screening Programme. The impact of multi-morbidity on bowel cancer screening experience, completion and outcomes is currently unknown.

My research is using interviews and health data to understand the impact of screening participant multi-morbidity on 1) the participant, 2) screening staff and 3) the screening programme itself. Health data for participants, including screening, GP and hospital data, will be accessed via the SAIL databank. This

provides an opportunity to explore linked health data for people who have taken part in Bowel Screening Wales since the beginning of the screening programme. This work will lead to an understanding of factors affecting experience and completion of bowel cancer screening in terms of barriers, decision pathways and outcomes for people with multi-morbidity. It will also identify tailored strategies and interventions that need to be developed at the participant, healthcare professional and system levels.

I am currently in the final stages of my Fellowship, which is due to end in September 2023. I am writing up findings for publication, and also sharing my research with the academic and clinical community. This is a really exciting stage of the project as it is great to be able to share what I have been working on.

The final part of the project will involve writing up recommendations and ideas for future work in this area, which will hopefully lead to benefits for bowel screening patients in Wales, screening staff and the screening programme as a whole."



**Above: A bowel cancer home testing kit from Bowel Cancer UK**

# Spotlight on an early career researcher: Dr Amy Case



*Amy (above right) is a clinical oncology speciality-training doctor based in South-West Wales, about to enter the final year of training to become a Consultant Clinical Oncologist.*

"Research plays a key part of clinical oncology training, and from early on, I had many opportunities to become involved, from gaining clinical experience looking after patients taking part in clinical trials, to completing formal qualifications such as a PGCert in Oncology at the Institute of Cancer Research, where we were taught by international cancer researchers.

Working with inspirational academic consultants and researchers and witnessing first-hand how a strong research focus leads to the development of world-class clinical services, is what initially inspired me to pursue an academic career and start exploring 'Out of Programme Research' opportunities. Attracted by the strong track-record of radiotherapy trial development in South Wales (for example, SCOPE2 and PATHOS), I applied for a Radiotherapy Research Fellowship, and was successful in obtaining a post at the Southwest Wales Cancer Centre in Swansea in 2021, under the supervision of Dr Sarah Gwynne (part funded by WCRC and Swansea Bay University Health Board). Still in this role, I am now

nearing completion of an MD at Swansea University. My research interest is developing the role of radiotherapy for the treatment of gastric (stomach) cancer. Gastric cancer is one of the less survivable cancers in Wales, with the five-year survival only 18.3%. At present, the only treatment to try to cure gastric cancer is surgery (usually accompanied by chemotherapy). However, for patients who cannot undergo an operation there are currently no other options to try to cure their cancer. Radiotherapy is not currently a standard radical treatment option for patients with inoperable gastric cancer. Thus, our research is looking at whether it could play a role here. My work has involved a comprehensive review of all the research that already done around the world to date exploring this, as well as surveying opinions of oncologists from all over the UK to find out their views on gastric radiotherapy, and whether they would support a future clinical trial. I am now conducting studies to establish the optimum technique for delivering high doses of radiotherapy to the stomach safely and effectively.

WCRC have part-funded my research fellowship, allowing me to take time out of training to focus solely on this project and attain a research degree (MD) with Swansea University. Under the amazing mentorship and support of Dr Sarah Gwynne and Professor Hayley Hutchings, I have had some incredible opportunities to develop my skills as a researcher.

Working alongside Dr Gwynne (above left), I have been fortunate to join an exciting new research collaborative, PIPAC UK. This has given me the opportunity to not only experience clinical trial development first hand and be part of the trial management group for a large national study, but also to gain my first publication. Thanks to all of

the experiences afforded to me by this WCRC funded fellowship, and the countless opportunities that I have had to meet a huge variety of other cancer researchers from all over the world, I have been able to start developing my own research network for what I hope will be an ongoing academic career in the future.

One of the highlights of my research journey has been the opportunity to gain experience in publication and present our work internationally. An abstract of the systematic review of the role of radiotherapy for gastric cancer that I have conducted as part of my MD, was presented at the European Society of Radiation Oncology (ESTRO) in Vienna earlier this year.

I have also had an abstract accepted for the biggest radiation oncology conference in the world, ASTRO, in San Diego later this year. I am extremely excited to have the opportunity to present the research being conducted in Wales, but also to meet expert researchers in this field from around the world and forge international research collaborations.

Having such strong Welsh roots, I feel passionate about raising the profile of cancer research in Wales, and optimising the opportunities for Welsh patients to enter clinical trials close to home. On a personal level, the huge breadth of skills, knowledge and experiences that I have gained during my fellowship will certainly provide me a springboard to begin forging an academic career in clinical oncology here in Wales. However, more importantly, the eventual goal of this research project is to develop a clinical trial to investigate the role of radiotherapy for inoperable, non-metastatic gastric cancer - the first randomised clinical trial in this setting, here in the UK."

# FEATURES

## WCRC: Supporting research into cancer and the immune system



Above: Dr Carly Bliss, Lecturer in Cancer Immunotherapies

*"The Wales Cancer Research Centre brings people together from across the diverse breadth of the cancer research community to underpin research excellence."*

## Viruses as cancer vaccines - introducing the work of Dr Carly Bliss

Adenoviruses have very diverse applications in medicine. This includes their development as "oncolytic viruses" that are trained to recognise and only infect tumour cells, to "adenoviral vectors" that act like Trojan horses to deliver a protein to tumour cells for our immune system to recognise.

The latter is the premise behind adenovirus-based vaccines and is the focus of WCRC's newly funded Researcher Dr Carly Bliss' research. Carly has recently secured a permanent lectureship

within the Viral Immunotherapies and Advanced Therapeutics (VITAL) group in the Division of Cancer and Genetics, which will give her the opportunity to grow her own group and research portfolio whilst still keeping close ties with the VITAL group in Cardiff University led by Professor Alan Parker.

In the last 12 months Carly has tested a panel of different adenoviruses for their suitability as vaccines. This includes measuring how the immune system may respond to the adenovirus and also to the proteins

they deliver, and exploring which adenoviruses are better suited to a particular route of delivery (e.g. nasal delivery or delivery into the muscle). She has also investigated how these vectors could perform alongside other adenoviral vectors already being used in medicine. Through multiple collaborations, the team has interesting data on two new adenoviruses: one that they have identified as highly suitable for development as a vaccine platform, and another that has potential to be developed as a vector for gene therapy.

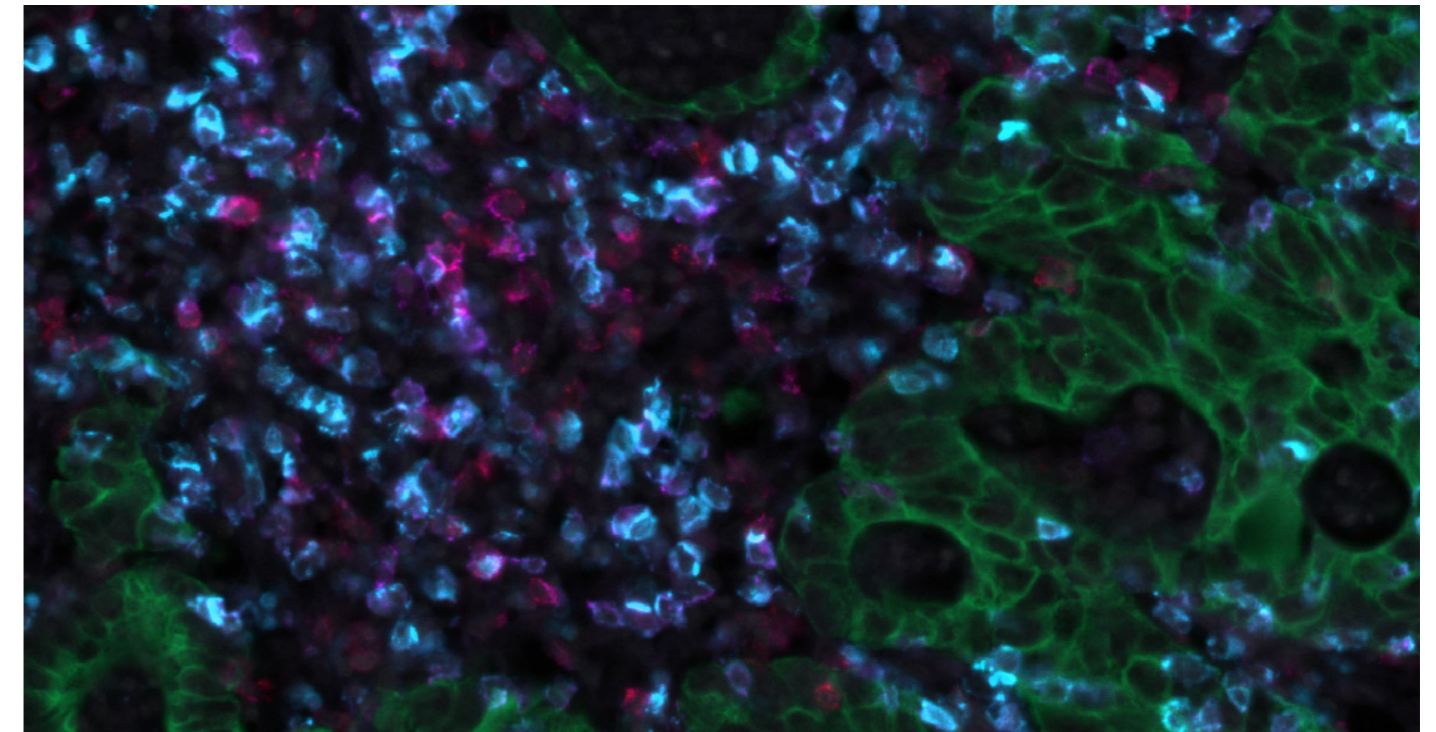
Previously Carly's research has focussed on inducing potent T cell responses against respiratory viruses. Support from WCRC, will allow her to expand on this research in cancer vaccines and therapeutics, which also require the robust T cell immunity the adenovirus-based platforms can provide. WCRC support has also facilitated a Postdoctoral Research Associate to work alongside her in the VITAL group, in addition to enabling her to commit to supervising undergraduate students on research placements. This broad support from WCRC will undoubtedly enhance the traction

of Carly's research, enabling greater outputs and impact going forward. Carly currently has manuscripts under preparation, which detail the two novel adenoviruses developed and tested for vaccine and gene therapy applications in the VITAL group. Funding applications are also under development that build on exciting preliminary data, whereby the powerful properties of anti-viral T cells are harnessed and retargeted towards tumour cells.

Carly said: "The Wales Cancer Research Centre brings people together from across the diverse

breadth of the cancer research community to underpin research excellence. This provides a unique platform that facilitates collaborative working and network building, which are highly valuable to me as this stage of my research career."

**Below: "Colorectal Cancer: T cells on the attack"** Colorectal cancer cells in green can be seen being attacked by immune cells (shown in red, blue and purple). Image produced by Michelle Sommerville. (PhD student in the Gallimore Godkin lab)



## Immuno-oncology WCRC CReSt lead wins £1.9m CRUK grant

Immuno-oncology CReSt theme lead Prof. Awen Gallimore and co-applicant Prof. Andrew Godkin have been awarded a £1.9 million 5 year programme grant by Cancer Research UK which started in April 2022. The research proposal for the grant was entitled 'Exploring the Relationship Between Antigen-Specific T Cells and the Tumour Microenvironment' with the research focussed on improving the success of immunotherapy. Awen

said "We know that white blood cells are capable of seeking out and killing cancer cells but that their efforts are often thwarted by barriers created by cancers. The essence of our work is to identify and break down these barriers with the aim of enabling white cells to more easily reach and kill their cancerous targets."

The research grant means that the team have also been able to employ 2 post-doctoral students, (a

bioinformatician and a research assistant) to work with them

Prof. Gallimore and Prof. Godkin are Principle Investigators in the Gallimore Godkin laboratory, which is part of the Systems Immunity University Research Institute in the School of Medicine and the College of Biomedical and Life Sciences at Cardiff University.

# Meet Professor Awen Gallimore

*We are delighted to introduce you to Professor Gallimore; Co-Director of the Systems Immunity Research Institute and CRSt Cancer Theme Lead for Immuno-oncology at Cardiff University*



Prof. Gallimore's interest in cancer immunology has led to a working partnership with the WCRC and our funded researchers. We asked her a few questions about her research and her hopes for future collaboration:

## **Tell us a little bit about your research and career trajectory.**

I'm an immunologist, with my first proper exposure to the field being as a DPhil student at the Institute of Molecular Medicine in Oxford. Working in Prof Sir Andrew McMichael's lab, I studied T cell responses to HIV and simian immunodeficiency virus, specifically asking whether there was a role for T cells in controlling infection. From there, and armed with a Wellcome Trust travelling fellowship, I went to Zurich as a post-doctoral researcher to the lab of the Nobel laureate Professor Rolf Zinkernagel. In Rolf's lab, I wanted to identify factors which determine the quality of T cell responses to viruses, ultimately leading to an interest in immune regulation and how the immune system controls the way it responds to different types of challenges. One of these challenges is cancer. After this, I went back to Oxford and set up my lab with the aim of understanding how we can harness knowledge of the way the immune system works to promote immune recognition of cancer cells.

I think it's really important that

immunologists are being drawn more and more into the cancer research field because it's increasingly understood that the immune system interacts with cancer on many levels, from cancer initiation, progression as well as its elimination. There's a real space at the moment for immunologists with years of training and understanding of how the immune system works, to redeploy their skills to tackle the problem of cancer.

## **How did you become involved with the WCRC?**

I've been part of the cancer immunology activities of the WCRC since it started. We've seen research in this area grow enormously in Cardiff over the last five or six years and there are now many more immunologists involved in cancer research; the WCRC has played a part in helping grow this community.

## **What has been the main benefit of your partnership with the WCRC?**

As the WCRC is keen to support radiotherapy and cancer immunology research, the Centre part-funded an MD student, Dr Hannah Reed to initiate a project to examine the immunobiology of radiotherapy. This wouldn't have been possible with normal funding streams as we had no track record in radiotherapy research. Hannah obtained ethical approval for the project with Velindre Cancer Centre which involved a detailed study of immune responses in patients receiving radiotherapy. She, and a GW4 PhD student, Jessica Oliver, worked with a team at Velindre to unpick the immunological effects of treatment in a cohort of patients. So, all in all, the WCRC has helped us set up a new project, leverage a PhD studentship and create an infrastructure for our research. We're now in a position where Jess has been able to establish a new collaboration with a lab in Monash, Hannah and Jess are writing up their

research findings for a paper, and we're using the preliminary data to write new grant applications.

## **How has the WCRC supported you as a Senior Leader?**

From the perspective of my own lab, the WCRC has supported projects such as the one above. It also supports a network of people both across Wales and further afield; I know a lot more about Cancer research in Wales because of the WCRC which coordinates activities, meetings and opportunities for us to meet. As a cancer theme lead for Cardiff University, it's really useful to have the WCRC as a local infrastructure which enthusiastically supports our initiatives.

## **What have been your career highlights so far?**

Science is a coalition of people who share enormous enthusiasm for discovering new things and I have had the privilege of working with amazing people, be that as bosses, colleagues or collaborators. Having an established lab with Professor Andrew Godkin is great - we have a fantastic team who go from mechanistic studies in mice through to clinical studies in patients, there is always something exciting going on. Every small success is a career highlight!

## **What are your hopes for cancer research in Wales over the next few years?**

I hope that we can grow the resources that we need to consolidate our research strengths so that we're an even stronger collective. For me it's about consolidation of investment and having sufficient support and funding to oil the wheels of success. Wales has fantastic scientists and several unique assets. With more sustainable support, strategic investment and a core infrastructure in biomedical science, we could make a very significant difference to cancer patients in Wales and beyond.

# Creating tools and techniques to enable cancer research in Wales

Advancements in tools and techniques for cancer research are crucial in improving our understanding of the disease and developing more effective treatments.

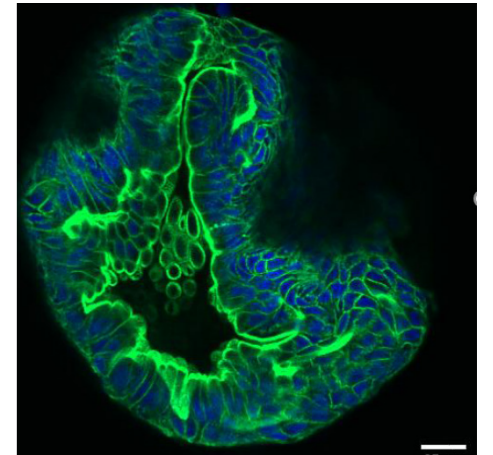
One of the areas where innovative tools and techniques are being developed to enable cancer research is in organoids and 3D models. Organoids are three-dimensional cell cultures that mimic the structure and function of organs. In cancer research, tumour organoids derived from patient samples can be grown and used for drug screening, studying tumour biology, and understanding drug resistance mechanisms. These models provide a more accurate representation of tumour behaviour compared to traditional two-dimensional cell cultures.

The WCRC is supporting research in this area through funded Research Associate Dr Stephanie Burnell who is working in Professor Awen Gallimore and Professor Andrew Godkin's immunology lab.

"I work closely with clinicians and patients in South Wales to collect samples that I use to develop

organoids, which are 3D samples of patient cancers we can grow in the laboratory. These are extremely useful because they provide us with a way of testing how different treatments affect growth of the cancer cells. Our lab is specifically interested in looking at how the immune system interacts with cancer, and we can do this using organoids and immune cells collected from the same patient. I'm developing imaging techniques which allow us to watch how the cells interact with each other over time and how we can change the nature of this interaction by testing different methods of stimulating the immune cells."

Funding from WCRC has made Stephanie's project possible and as part of this, she was awarded funding from the Future Leaders in Cancer Research (FLiCR) award which allowed her to visit a specialist lab in Utrecht, the Netherlands, to learn from 3D imaging experts. She was then able to come back and apply her new knowledge to her experiments in Wales. Stephanie said: "With better techniques, and more precise images, I will be able to observe and analyse the organoids with greater accuracy.



**Above: an organoid stained to show the nucleus (blue) and cell membrane (green)**

From this project, we have also successfully obtained funding to develop an educational computer game describing and explaining immunotherapy and the production of a flipbook detailing T cell killing of tumour organoids, in addition to a PhD studentship from the NC3Rs which will start in October 2023."

Stephanie now aims to find ways of making the bank of organoids that she has produced available to the global research community. She said: "Through WCRC funding we have created a rare and valuable resource."



**Above: Dr Stephanie Burnell, WCRC funded Research Associate, Immunology group at Cardiff University**



*"My WCRC Fellowship gave me the protected time and space to develop my research and apply for funding to help make my ideas for the QuicDNA pilot study a reality"*

## Revolutionising cancer diagnosis across Wales – the QuicDNA study

Dr Magda Meissner, a Medical Oncologist and previous WCRC funded Research Fellow, is leading the way on a new trial involving an innovative blood test to improve lung cancer treatment that has the potential to offer new hope to millions of patients across Wales and beyond.

A graduate of the Future Leaders in Cancer Research programme, she received a £230,000 Research for Patient and Public Benefit (RfPPB) grant from HCRW in October 2022 for her work on the study, which aims to shorten the time from referral to the start of treatment for lung cancer patients.

The QuicDNA study is supported by the All-Wales Genomics Laboratory and hosted at the Aneurin Bevan University Health Board (ABUHB) with additional support from Illumina technology, Life Sciences Hub Wales, Moondance Cancer Initiative and investment from multiple partner organisations. Focusing on lung cancer, the study involves taking blood samples at an early stage of the cancer pathway to explore the genomic profile of a patient's cancer. This means

that targeted treatments can then be decided and administered much more quickly improving patient outcomes and survival rates. "Lung cancer is the fourth most common cancer in Wales, and the majority of patients are diagnosed at an advanced stage," said Dr Meissner. "Cancer genomic profiling allows clinicians to select the most appropriate, personalised treatment for the individual patient. "But at the moment, the current pathway is not meeting nationally recommended standards. We want to speed up the process by testing lung cancer patients earlier in the diagnostic pathway using a blood test. This has the potential to save lives by increasing early access to targeted therapies."

Clinical trials have proved that targeted therapies improve patient outcomes, including survival, and have fewer side effects than chemotherapy or immunotherapy. Dr Meissner explained that as part of the project, personalised patient treatment will be guided by their blood test results. The QuicDNA study began enrolling patients in April this year, and the data

produced will be shared not only in Wales but also internationally, including the USA, to benefit researchers worldwide.

Magda's research and funding applications for the QuicDNA trial began during her funded Research Fellowship with the WCRC. "My WCRC Fellowship gave me the protected time and space to develop my research and apply for funding to help make my ideas for the QuicDNA pilot study a reality. Without the Centre I definitely wouldn't have progressed with the study so quickly and I am very grateful for the support."

The impact of Dr. Magda Meissner's QuicDNA study is far-reaching and inspiring hope among patients, their families, and the medical community. Through her unwavering commitment to pushing the boundaries of cancer research, Dr. Meissner is paving the way for a future where cancer can be effectively diagnosed, quickly, treated, and ultimately cured.

**Above: Dr Magda Meissner, Clinical Academic Medical Oncologist at Cardiff University and Velindre University NHS Trust and lead of the QuicDNA study**

## Supporting population research: cancer research that serves the community

Since its inception, the WCRC has supported funded researchers and academic partners to pursue cancer research that serves the community, helping to advance understanding of cancer, develop innovative treatments and improve patient outcomes.

At the heart of this, is WCRC funded Research Fellow Dr Grace McCutchan (Division of Population Medicine, Cardiff University) whose research is about reducing socioeconomic inequalities in cancer. Her research focuses on how best to encourage early diagnosis via screening and help-seeking for symptoms, and support cancer prevention. Over the last year Grace has been involved with several studies that have taken research into the community and worked with health professionals and local people to communicate messages about the importance of cancer screening, early detection and smoking cessation.

One of these studies is the Yorkshire Cancer Research-funded YESS (Yorkshire Enhanced Stop Smoking) study, led by Prof's Rachael Murray and Mat Callister at Nottingham University. Grace and Prof Kate Brain are co-applicants, and with Research Assistant Hoang Tong are leading on the process evaluation. The YESS study aims to test how best to support patients with quitting smoking when they attend lung cancer screening. The study has been testing whether a booklet containing scan images of patients' own heart showing areas of damage caused by smoking could motivate patients to quit smoking. The study has specialist smoking cessation practitioners trained to go through the booklet with patients. They have been specially trained to help patients to build confidence to stop smoking and reinforce the health benefits of quitting. The booklets were created in collaboration with members of the public with a history of smoking and living in deprived areas of S. Wales and Yorkshire. Input from

members of the community was essential to decide how best to present information about potential damage to their heart and lungs to make sure they understood what the booklet was telling them.

Another example of research that serves the community is the Cancer Research Wales-funded TIC-TOC (Targeted Intensive Community-based campaign To Optimize Cancer awareness) study, for which Grace and Prof. Kate Brain are Co-Chief Investigators. TIC-TOC aims to test the feasibility of delivering and evaluating a community-based vague cancer awareness campaign in deprived communities. The TIC-TOC campaign has been spreading positive messages about what vague cancer symptoms to look out for and why it's important to seek medical help early. The campaign involved putting messages out in the community in different ways, for example via social media, pharmacy

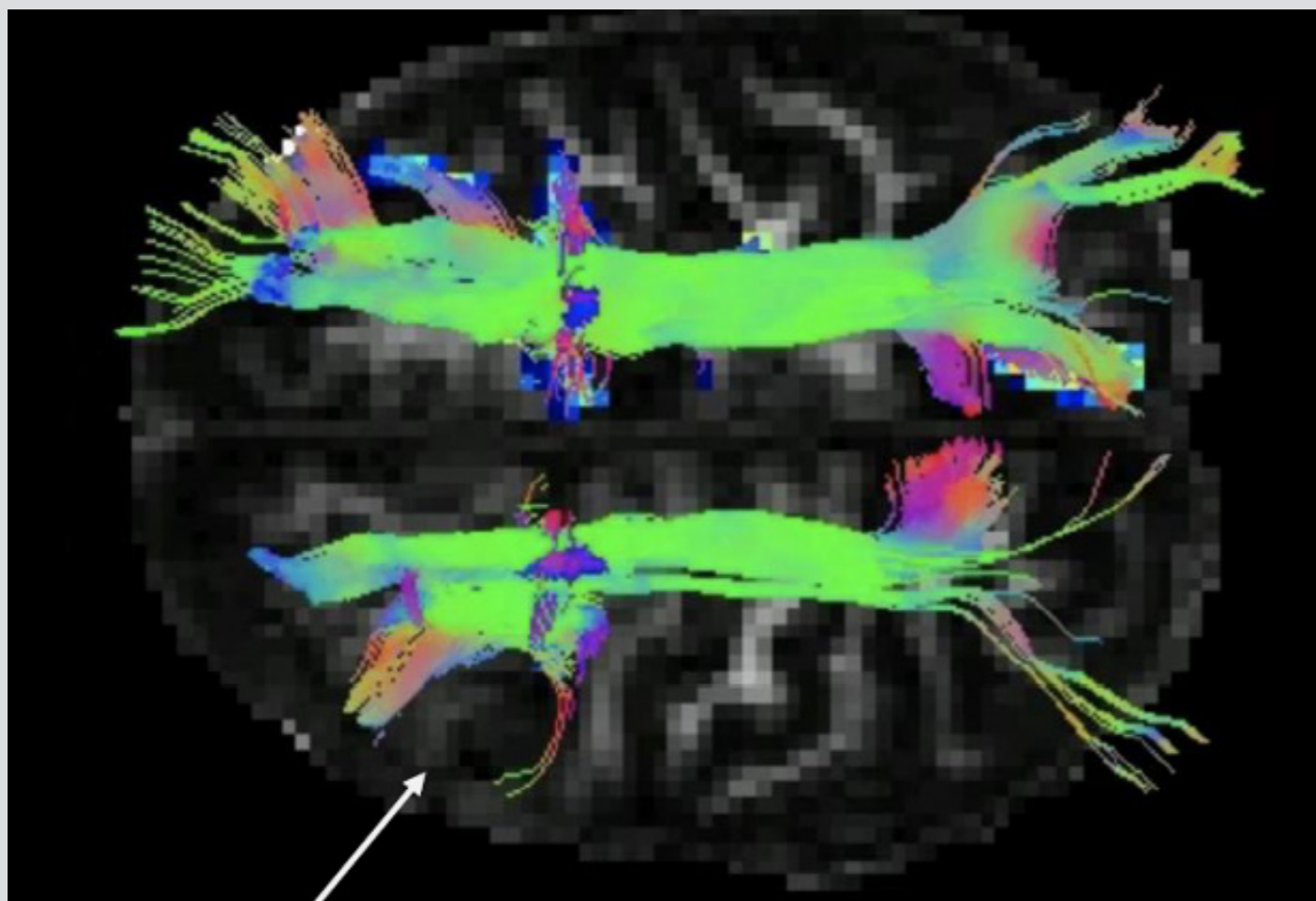
bags, posters and with 'Cancer Champions' - members of the local community trained to support and legitimise help seeking and visit community groups/community venues to distribute campaign information. The results are being finalised, with plans for further evaluation in progress.

Grace said: "To combat inequalities, we need high-intensity, easy-to-access and supportive interventions that take into account the wider determinants of health. Training local people who know their communities and how best to communicate key messages about early diagnosis and prevention has the potential to make a real difference. They can help to support people with major positive changes to their health like quitting smoking or provide that extra support to help people visit the doctor with symptoms."



*"Training local people who know their communities and how best to communicate key messages has the potential to make a real difference."*

**Above: Cancer Champions Lisa Howells (L) and Angela Brennan (R)**



## The WCRC Brain Multi-Disciplinary Research Group (MDRG) – supporting bids in brain cancer research

The Brain MDRG, led by Dr James Powell and Dr Florian Siebzehrubl, has promoted research excellence in neuro-oncology since its inception in 2018 by facilitating cross-cutting collaborations between NHS and academics in Wales.

The MDRG has attracted wide attendance from clinicians, researchers and other staff at all career levels across the tripartite hub in Cardiff (Velindre University NHS Trust, Cardiff and Vale University Health Board, and Cardiff University) as well as from across Wales. Several of the collaborations launched through the MDRG succeeded in attracting external funding and resulted in publications and other research outputs. Some key examples are given below.

The brain MDRG was successful in promoting research excellence in brain cancer to the wider community, for example through the Cardiff University's College of Biomedical and Life Sciences (CBLS), the Experimental Cancer Medicine Centre (ECMC) and the Centre for Trials Research (CTR). This has led to several new research posts jointly funded by WCRC and Cardiff University, including a research assistant in the Division of Cancer and Genetics, research associate in the Brain Repair and Intracranial Neurotherapeutics unit (BRAIN) and a research fellow in the Systems Immunity Research Institute (SIURI).

There was a successful collaborative application for the Cardiff Tessa Jowell Centre of Excellence application with contributions from

Velindre Cancer Centre (VCC), Cardiff and Vale University Health Board, the Marie Curie Research Centre (MCRC) and Cardiff University, resulting in Cardiff being awarded this prestigious designation in 2022.

A separate application for a Cardiff Brain Tumour Research Centre of Excellence this year involved 14 principal investigators across the College of Biomedical and Life Sciences (CBLS), the Cardiff University School of Engineering (ENGIN), and VCC, and garnered substantial support from Cardiff University, which provided in-kind contributions of approximately £2.5m. The application was reviewed positively and while the Centre status was not awarded, the funders highlighted the strengths, innovation, and range of expertise

engaged in brain tumour research in Cardiff.

The MDRG has supported a productive clinical collaboration between VCC and the Cardiff University Brain Research Imaging Centre (CUBRIC). Together, they have completed a novel, observational study measuring neurocognitive function in patients undergoing stereotactic radiosurgery for brain metastases where patients attended CUBRIC for novel MRI scan sequences before and after radiotherapy treatment (see photo below).

This was the first Oncology collaboration between VCC and CUBRIC, and was led by Dr Sahar Iqbal funded by the WCRC to complete a PhD. This project led to a subsequent collaboration between VCC & CUBRIC and a successful grant application to the Engineering and Physical Sciences Research Council. This EPSRC funded project has started to recruit patients and

will build on observations and themes from the initial CUBRIC collaboration.

The MCRC has an expanding portfolio of research in the field of brain tumours. It currently has ongoing studies in the areas of patient reported quality of life in glioma research, patient and family attitudes to structured physical activity in high grade gliomas, screening tools for radiotherapy-related cognitive deficits (PhD studentship) and has completed a Cochrane Review on early palliative interventions in brain tumours.

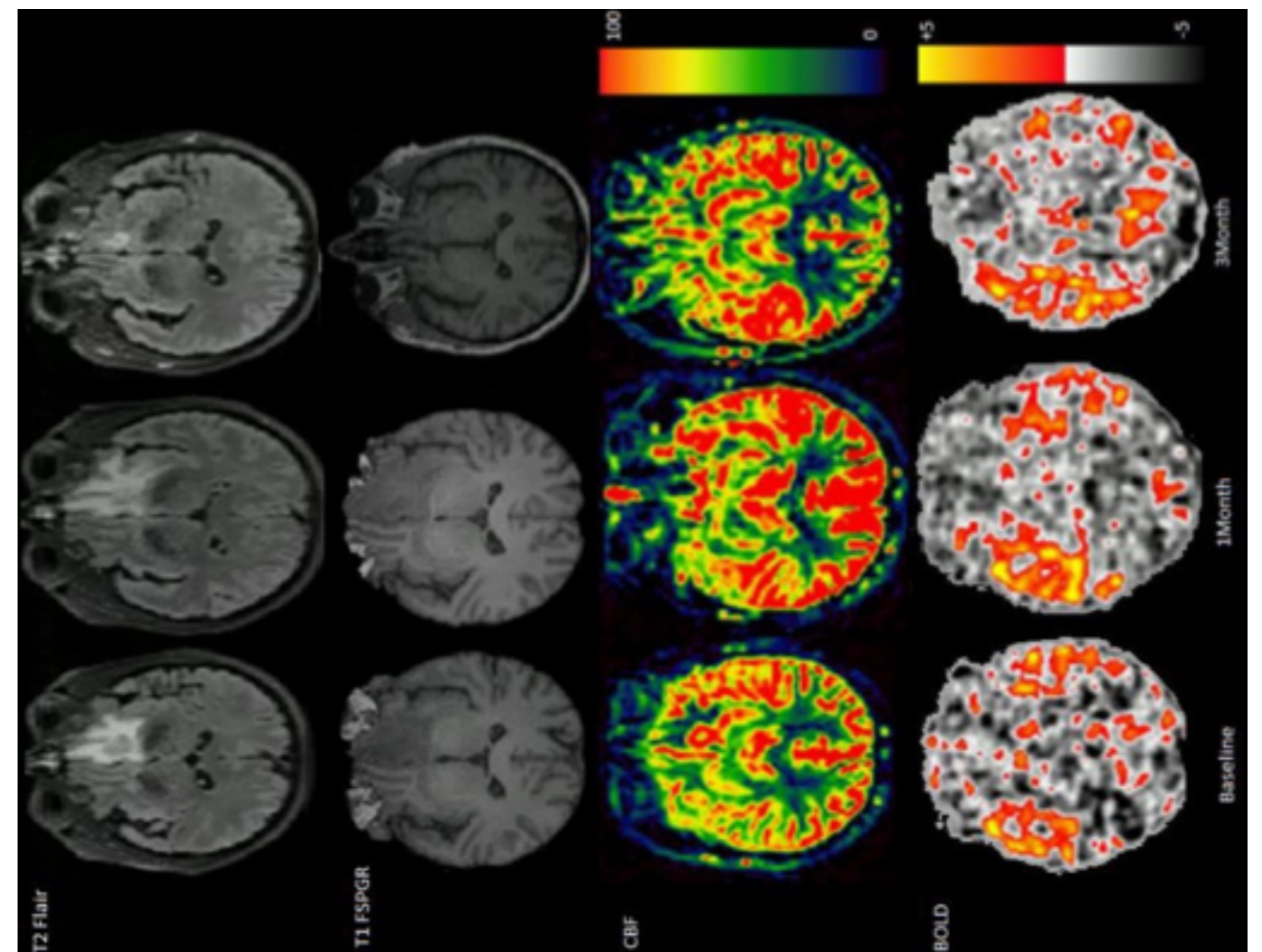
The MDRG helped foster a collaboration between VCC and the School of Engineering, studying the role of radiomics in high grade glioma and received a grant from the Engineering and Physical Sciences Research Council (EPSRC) & VCC Headfirst charitable fund for this project.

Translational research themes

currently being developed involve patient-derived 3-dimensional cultures to predict glioblastoma patient response to chemotherapy, patient-derived organoid models to study glioblastoma invasion and immune evasion, studies of T cell activation in the glioblastoma immune environment and new experimental oncolytic virotherapies to target glioblastoma cells.

**Opposite page: Nerve fibre tract in the brain - bottom tract is affected by the tumour (white arrow) whilst the top tract is unaffected. The tumour is pushing the bottom tract out of its place, whilst on the opposite (unaffected) side the nerve fibre is penetrating the surrounding brain normally**

**Below: From left to right, Structural, Cerebral Blood Flow Map and Blood Oxygen Level Dependent Map of the left inferior frontal lobe brain metastasis in a participant (bottom images), 1 month (middle images) and 3 months (top images) after radiotherapy.**



# Why data matters in cancer research - our future plans

Data plays a crucial role in cancer research and the WCRC is helping and supporting data analytics and bioinformatics capacity in Wales to grow.

Having access to cancer data helps with many vital aspects of cancer research including: the discovery of biomarkers (used for early detection and treatment selection), treatment development, providing insights into genetic changes, enabling the development of predictive models to guide treatment decisions and helping with collaboration among researchers through data sharing.

Due to its importance to the future of cancer research, helping researchers to develop the specialised skillsets and methodologies required to utilise large and complex datasets will be a key focus for the WCRC going forward. Support will be offered from the Centre through the recruitment of 10 new positions across Cardiff and Swansea University over the next two years. This will include 5 new data scientists, including 2 part-

time roles to provide specialised input from senior research leaders directed towards the 'unlocking' of genomic data in cancer for research purposes. There are also 5 bioinformaticians, with different remits, who will engage in the research of cancer researchers, as well as follow their own academic interests and build their own portfolio, ensuring that the large amounts of data being generated can be put to best use.

The WCRC is working with leaders in this field who will mentor and train the next generation of researchers. Professor Duncan Baird, CReSt theme lead for Precision and Mechanistic Oncology said: "The use of genomic data is ever increasing across many areas of cancer research ranging from discovery science to clinical application. These massively complex datasets require specialised skills to analyse that many scientists don't have. [This support] will stimulate the development of academic bioinformatics-based researchers, who will develop their research portfolios in Wales.

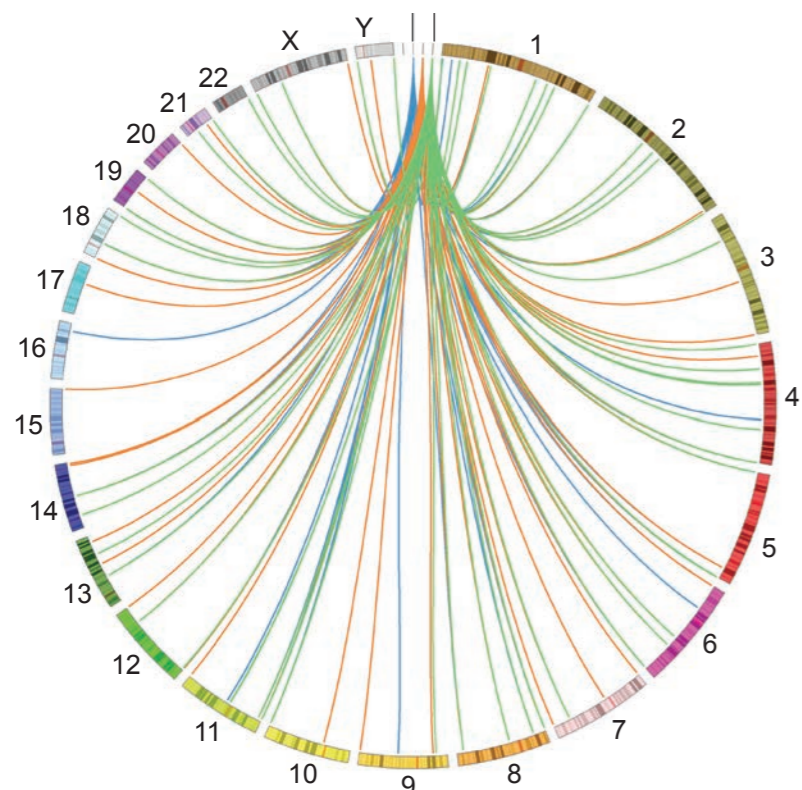
These PIs will bring new expertise and collaborations with existing researchers, in doing so it will stimulate new research activity and help cancer science in Wales compete in the international arena".

Dr Robert Andrews, theme lead at the Cardiff Systems Immunity Research Institute said: "It is recognised that growing capacity in bioinformatics and data handling equips cancer researchers with the necessary know-how and resources to help make sense of their data. This [opportunity] supports a vision to train cancer researchers in data skills, and facilitate the adoption of good practices, by recruiting a full time bioinformatician tasked to support these activities. This bioinformatician will perform training and small coding tasks across a number of labs and operate on-demand "data clinics" to help researchers analyse the data they generate locally, as well as make use of publicly available datasets from large cohorts such as the Cancer Genome Atlas Program (TCGA)."

Prof Sunil Dolwani, CReSt theme lead for Population Health-based Cancer Prevention said:

"The data scientist positions planned for the next two years will provide much needed capacity building in this exciting area of research. Expertise in methods and techniques is key to progression in this field. The opportunity to develop these skills by working on exemplar case studies will give an opportunity for early stage data scientists to develop the required skills and knowledge to grow and develop in this area and this in turn will lead to more research positions in this area, giving data scientists the opportunity to conduct further research."

The WCRC recognises that by harnessing the power of data, researchers can gain deeper insights into cancer biology, improve patient outcomes, and ultimately work towards more effective prevention, diagnosis, and treatment strategies.



**Above: A Circos plot showing several different types of genomic data across dozens of chromosomes in a single plot**

# A LOOK TO THE FUTURE



**Above: Dr Mahulena Maruskova and Professor Alan Parker from the Viral Immunotherapies and Advanced Therapeutics (VITAL) laboratory, Cardiff University School of Medicine.**

Looking forward to 2023-24 and beyond, the WCRC will build on the strong foundations that have been established this year and continue to lead the implementation of the Cancer Research Strategy (CReSt) for Wales, increasing our efforts to act as an effective coordinator and broker of collaboration and integrated working across the cancer research community in Wales.

One way we plan to do this is by organising a Wales Cancer Research Conference in the Spring of 2024, which will showcase the best of Welsh talent, highlight the importance of PPI in cancer research, promote collaboration and provide inspiration and guidance for the next generation of cancer researchers in Wales.

We will also be aligning our Multidisciplinary Research Groups (MDRGs) with the six CReSt themes, bringing pre-clinical and clinical researchers together within each theme to discuss and lead collaborative research

opportunities. Alongside this, we will establish a cross-cutting Cancer Data Group, in order to maximise the significant opportunities that exist for cancer research in Wales if we can as a community fully harness the potential of our data and genomic infrastructures and services.

This year, we are hoping that the WCRC will have the opportunity to bid for funding for another 5 years (2025-30), to support and grow cancer research in Wales. Over the next few months we will be working closely with our Research Partners, CReSt theme leads and institutional partners to shape and refine our strategic focus for the next bid.

In the meantime, I would like to thank the WCRC hub team - Jenni, Ceri, Sarah, Zoe, Katie and Louise - for their hard work and continued good humour throughout this year. Furthermore, I would like to thank our funded researchers and supervisors for their inspiring work, our CReSt theme leads for their academic and scientific leadership,

our Research Partners for their excellence in PPI, and our WCRC/ CReSt Steering Group and External Advisory Board for their oversight, sage and wise advice and guidance.

I do also want to thank Cardiff, Swansea and Bangor Universities, as well as Velindre University NHS Trust and Cardiff and Vale University Health Board for their willingness to co-fund and provide sustainability plans for a number of research positions, and for supporting the work of the WCRC.

Finally, I would like to thank Health and Care Research Wales and the Welsh Government for their continued support.

As we look forward to the next year I am optimistic that we can continue to build a connected and supportive cancer research community in Wales, enabling excellent research that ultimately will benefit patients in Wales and beyond.

**- Prof Mererid Evans, Director**

[www.walescancerresearchcentre.org](http://www.walescancerresearchcentre.org)

