CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

School of Medicine
Ysgol Meddygaeth

Public Engagement and Public Involvement in Research at Cardiff School of Medicine

This report highlights a variety of public engagement and involvement activities within the Research Divisions in the School of Medicine during the academic year 2017-2018.

Definitions

For clarification, the following definitions of public engagement and public involvement with research are provided.

Public Engagement with Research

This is the myriad of ways in which research is shared with the public. This is often referred to as dissemination and engagement.

Activity can include:

- Participating in festivals
- Working with museums / galleries / science centres and other cultural venues
- Contributing to new media enabled discussion forums
- Engaging with young people to inspire them about research (e.g. workshops in schools)

Public Involvement in Research

This is research carried out 'with' or 'by' members of the public throughout the various stages of the research life cycle rather that 'to', 'about' or 'for' them.

Activity can include:

- Offering advice on potential 'research priorities' as members of a research project steering group
- Involvement in the design of patient facing materials (e.g. information sheets, leaflets etc.)

Overview

Public engagement and public involvement at Cardiff University's School of Medicine is a recognised aspect of academic work that plays a vital role in enhancing the School's core activity of research, education and training.

Activity of this nature generates dialogue and trust between research and society, ensuring the results of our work reach out beyond the usual environments of academia, business and government.

It inspires the next generation of talent and broadens and informs public attitude, enhances the quality, relevance and impact of the research we do and contributes to the future economy and well-being of society.

Introduction

The School of Medicine engages and involves members of the community in a variety of ways, from working with schools, delivering lectures, offering work experience and giving members of the public opportunities to get involved in on-going state of the art research.

This report provides an overview of the centrally coordinated schools engagement programme and examples of how each of the four Research Divisions (Cancer and Genetics, Infection and Immunity, Population Medicine, and Psychological Medicine and Clinical Neurosciences) engage or involve the public in their research.

Schools' Engagement Programme

At the School of Medicine, there is an enormous amount of engagement work aimed at inspiring school children across Wales to get them excited about science and inspiring the next generation of talent to think about potential careers in science and medicine.

Some of this activity is coordinated centrally through the Public Understanding of Science in Health (PUSH) programme and some of it is research-focused. In addition to this, staff respond to ad hoc invitations from local schools and groups to carry out tailored engagement activity, and role model careers in science and medicine.

Public Understanding of Science in Health (PUSH)

Throughout the year, the School of Medicine coordinates a Science in Health public lecture series, a Life Science Challenge quiz, Science in Health LIVE and a laboratory work experience scheme.

Science in Health Public Lectures

The highly successful Science in Health Public Lecture Series is now in its seventeenth year and continues to attract a diverse audience of interested individuals.

The lectures have three main aims – to open up areas of concern in health care, to present new research on health issues to the public and to inspire the next generation of life science researchers.

The lectures are held monthly on Thursday evenings from October to March, and are recorded and available on the Science in Health website pages of Cardiff University. Topics from the 2017-2018 series include:

Mental Health and Genetics: What Do We Know?

Of Mice and Men: Why Do They Love Cocaine?

Epilepsy: Fits, Faints and Funny Turns

Genome Editing: Its power to transform medicine and some potential pitfalls.

Reach:

- Approximately 150 members of the public, secondary school pupils and professionals attend each lecture

Impact:

- Provides information on public health and current medical research and opportunities to engage experts and ask questions
- Provides a broad perspective for students considering a career in a variety of areas of healthcare and biomedicine.

Feedback from the lectures include:

"very interesting to hear about new research and understanding our bodies, often relevant to keeping ourselves well and healthy"

"my daughter attended when in sixth form and gained a place to study dentistry. She had mentioned these lectures in her personal statement. I suspect many of the audience members are in the same position. I am still coming 5 years later and my daughter graduates this year!"

"very valuable insights into modern medicine and its implications"

"allowed me to further my passion for science"

"speakers are consistently of high quality"

Science in Health - Live 2018

This annual event involves six schools within Cardiff University (Medicine, Dentistry, Healthcare Sciences, Optometry and Vision Sciences, Bio-sciences and Pharmacy and Pharmaceutical Sciences), and is one of the UK's largest interactive science events for sixth formers.

Pupils spend one day at the School of Medicine on the site of the University of Wales Hospital. Their day includes:

- laboratory tours
- interactive exhibition areas
- sound science performance
- short talks on various hot topics
- final closing career session on 'Where can science lead you?' where interactive live polling is used to positively encourage pupils to ask career-related questions.

Reach:

- Over 800 pupils in Year 12 from across Wales and the border counties
- Teachers accompanying the pupils

Impact:

- Teachers and students find out about degree opportunities in science and healthcare
- Informs of ongoing biomedical research and possible career opportunities
- Raises awareness among potential applicants of the course opportunities available in Cardiff University

These are some of the comments following the event:

"an enjoyable day once again with valuable information about science and medicine courses. We will continue to bring students annually"

"it gave me an idea of what it is like to work in a lab"

"enjoyed all parts of the event because they all taught me something new"

"gave me some great insight into research and lab work"

"great event organisation and very creative ideas"

"it was an inspiring day for my students"

Science in Health – Life Sciences Challenge

The Life Sciences Challenge/Her Gwyddorau Bywyd is an inter-school quiz competition delivered in Welsh and English aimed at Year 10/11 pupils. Every year, a new quiz is designed and delivered by PhD students, early career researchers and staff.

The researchers who take part in the Life Sciences Challenge quiz are passionate about science and wish to share their enthusiasm for the natural world with pupils in Wales.

The event gives pupils the opportunity to meet young scientists working locally, and tests pupils' ability to analyse data and apply logic and learned knowledge to unfamiliar concepts, helping them to understand the living world.

Reach:

- 384 pupils from 43 schools across Wales entered the quiz
- Teachers, careers advisors and the families of pupils who attend the quiz finals

Impact:

- Raising awareness and inspiring pupils to consider the possibilities of careers in science and medicine
- Increasing understanding of the role of science in health
- Promoting the work and research of the University in the science and healthcare disciplines
- School pupils networking with other schools

Dr James Matthews, quiz organiser, had this to say:

"It is particularly rewarding that in its fifth year the 'Life Sciences Challenge/Her Gwyddorau Bywyd' has for the first time become a national competition across the breadth of Wales. Pupils have traditionally had the opportunity to achieve for their schools in the domains of music, sport and drama so it is fantastic that we now have a school team competition that rewards and recognises those who excel in maths and science. The quiz is all about inspiring the next generation of scientists, engineers and doctors in Wales."

Nia Jones, teacher from Ysgol Tryfan said:

"It was a very worthwhile experience! The quiz was both challenging and exciting. The pupils thoroughly enjoyed the element of challenge posed by including questions based not only GCSE and some AS level science but also on general knowledge and current developments at the forefront of science.

Being able to compete at this level in Welsh is an experience that pupils should be allowed to experience and I applaud Cardiff University School of Medicine for seeing the importance of running the competition in both languages."

Science in Health Work Experience Programme

Six form students competitively apply for a place on the laboratory work experience scheme by the end of March. Places are confirmed in May to those pupils who are successfully selected to attend a week of work experience based at the School of Medicine in June or July.

This scheme attract students who are interested in pursuing a broad range of undergraduate courses such as biochemistry, genetics, dentistry and medicine, as well as those considering a career as a research scientist, GP, hospital consultant, pharmacist or working in industry.

Following an introduction to the laboratories, students have a range of experiences working in teams with a number of different investigators and their research groups. Students have opportunities to experience cutting edge-technologies like molecular biology, flow cytometry, DNA sequencing, egg micro-injection, virology, mass spectrometry, X-ray crystallography, pharmacology and cellular immunology with research groups from across the school. This gives them a far broader awareness of career opportunities.

Feedback from the students on the 2018 work experience scheme include:

"After these five days, I'm now sure I want to become a scientist."

"I'm hoping to apply to Cardiff for Medicine and meeting the staff who have all been so lovely has confirmed that"

"The week helped me decide that I'd like to apply to medicine rather than a research based subject"

"It has helped me be confident in knowing that I want to study Biomedical Science after having had first-hand experience of lab work"

"The passion that the staff at Cardiff University have for their respective fields was extremely inspiring. It made me glad I wasn't considering a repetitive 9-5 job because I had seen first- hand a group of intelligent individuals who love what they do. And they love it because it's different every day and because they're making a contribution to society. That's what I want to do. Make a contribution. So thank you again."

Reach:

- Applications are invited from sixth formers based in schools across Wales
- In 2018, applications were received from 43 pupils
- 36 pupils attended a one week work experience programme

Impact:

- Raising awareness of the range of Cardiff University programmes
- Promoting the work and research in science and medicine at the School
- Providing a greater understanding of the range of career opportunities as a result of obtaining a degree in science or medicine

MEDIC Ambassadors

At the start of the academic year 2017-18, the School of Medicine launched a MEDIC Ambassadors scheme, with two main purposes:

- To enable expansion of engagement activity with schools and communities across Wales, providing additional support and mentoring to pupils and teachers, enhancing the curriculum and raising aspirations from a School of Medicine perspective
- To enhance mentoring, pedagogy, communication and employability skills in staff and students.

During the first year more than 70 students from across the years of study registered to become Ambassadors.

Reach:

- 200 pupils mentored and given support with their applications and interviews to medical school (Widening Access to Medicine Scheme (WAMS).
- The scheme has built up gradually in the first year of being launched. As of July 2018 participation was as follows:

Secondary schools (2)
1. 2 x Testicular Cancer Workshops
2. School Health Fair
3. Year 10 Wellbeing Day
4. Mock MMI session

Primary schools (2)
5. Medical Day
6. Careers Fair

Public Events
7. Brain Games
8. Tafwyl Festival

- 14 MEDIC Ambassadors have taken part in the above events (some on multiple occasions).

Requests were increasing towards the end of the schools' summer term, with further activities lined up for the start of the next academic school year in September 2018. It is anticipated that the scheme will continue to grow during the next academic year, with additional Ambassadors recruited and further opportunities created with both primary and secondary schools across Wales.

Impact:

The impacts for university staff, alumni and students are:

- Development of employability skills
- Enhanced communication skills
- Supporting the National Curriculum
- Inspiring future scientists, medics and healthcare professionals
- Supporting the recruitment strategies of CU
- Establishing relationships with schools to make learning fun and engaging.

The impact for schools and teachers include

- Support in teaching the curriculum
- Enhanced learning, backed up with "real life" examples
- *Inspiring teachers and pupils and raising career aspirations*
- Long term partnership with Cardiff University School of Medicine.

Feedback from MEDIC Ambassadors who have participated to date include:

"I feel more confident in my ability to teach children especially on a topic as sensitive as breast cancer. It also gave me the chance to practise presenting, which will obviously be useful in the future for both myself and my patients".

"I have not had previous experience of teaching students. This experience enhanced my teaching skills and made me more confident to speak in front of an audience. At the end of my talk, I did a quiz to gauge how much the students retained from the talk. I found 99% of the students answered correctly to all the questions, showing they were paying attention and understood the information."

"I enjoyed talking to the pupils and teachers. We were able to engage students and teach them CPR. This helped reinforce my own learning related to CPR and improve my communication skills with young people. In this school, there are a large number of pupils who are learning English, which gave me experience communicating despite a language barrier."

Teacher feedback has been equally positive

When asked if it was a worthwhile activity for them and their pupils, we received these responses:

"Definitely. I learned different things as well as the children! It linked in with our 'All About Me' topic perfectly and enabled the children to have real life experiences. Lots of them now want to become doctors!"

"The pupils thought that the event was brilliant and everyone had really positive things to say. In particular they enjoyed the stall on lung health and the health MOT as these offered practical and tangible things for them to try. Thank you to all the students that participated on the day and who showed great enthusiasm with the pupils."

Research led School visits – Blood, Guts and Gore

In an exciting approach to engaging young pupils, an event entitled 'Blood, Guts and Gore' was brought to a group of 7–8 year olds in St Brides Major Church in Wales Primary School.

Dr Ian Humphreys from the Division of Infection and Immunity encouraged a hands-on approach, enabling the pupils to use microscopes, look at cells, use lego to represent the immune system and even giving pupils the opportunity to make 'snot'!

The pupils learned a great deal from free play and were given access to tools to reconstruct how immune cells kill tumour cells. Pupils had an insight into what a scientist does, and indicated that they may consider it as a future career.

Ian gained a great deal of personal satisfaction from delivering the events.
"I love doing these events. It reflects well on the School of Medicine and ultimately on the University, to fulfil its Civic Mission statement by contributing to the quality of education in Wales through active participation."

Reach:

- Group of local school children aged 7 – 8
- Teachers and the families of the group of school children

Impact:

- Greater awareness for school children in how the immune system works
- Beneficial relationships built with the school for future engagement activities
- Early opportunities for young children to be inspired about a range of career options in science and research
- Opportunities for school visits to additional schools to reach a broader audience
- Children experiencing science as fun!
- Successful application made for funds from the Wellcome Trust to purchase small lab coats and microscopes to use in future events and to extend the visits to other schools.

Nuffield Scholarship and Cardiff China Medical Research Centre (CCMRC)

The School of Medicine supports the Nuffield Foundation Scholarship, in conjunction with Techniquest, by providing a number of placements for students from all over Wales.

The placements provide inspiration for science related 'A' level students who may want to consider a future as a scientist or a medic.

Following a CV application, students are selected for a 6 week placement, based at the University Hospital of Wales. They attend during July and August where they work in the laboratories at the Cardiff China Medical Research Centre.

Reach:

- The Scheme offers placements for 'A' level students
- Students come from all over Wales
- It is an annual scheme and over the last 15 years, approximately 55 students have been hosted.

Impact:

- The majority of students on the scheme continue their education at University
- The placement opens the student's eyes to the possibilities of many different science and healthcare career pathways
- CCMRC provides each student with a reference following the placement
- The School of Medicine is promoted as an excellent place to study
- A previous Nuffield placement student returned to Cardiff University as a PhD student.

Public Engagement and Involvement in the Division of Infection and Immunity

In the Division of Infection and Immunity, researchers explore highly complex immune responses in an integrated manner, using experimental, clinical and systems-based approaches.

The research uses state-of the art technologies and benefits from unique access to disease models, patient cohorts and tissue banks, to answer fundamental questions concerning the mechanisms of immunity and to develop diagnostic and targeted treatment strategies for real-world applications.

The immune system plays a fundamental role in the pathology, and hence potential therapy and diagnosis, of most acute and chronic diseases affecting developed and developing societies. These disorders span infection, cancer and metabolic and inflammatory conditions. Research on the underlying mechanisms and their exploitation in the clinic has direct implications for public health.

The Division engages with and involves the public in a variety of ways. Importantly in the Systems Immunity Research Institute, Professor Matthias Eberl formed a Lay Faculty, which is made up of members of the public, keen to get involved in the research of the Division. To date, the Lay Faculty has got involved in reviewing research priorities, helping to identify new lines of research, providing feedback on research proposals and impact statements, and contributing to the dissemination of research findings to relevant target groups.

Staff within the Division actively develop workshops, seminars and exhibits that focus on all aspects of research. Close partnerships have been developed with key stakeholders such as Techniquest, and members of staff from the Division have participated in a number of public events such as the Cardiff Science Festival and The National Eisteddfod.

Dr Simone Cuff, a researcher in the Division uses art as a way to engage the public in her research. Recently, Simone created a piece of artwork celebrating the international nature of medical science in Wales. This piece was exhibited at the HeARTh Gallery in Llandough Hospital.

Case Study Examples:

Wales Kidney Research Unit Open Day

The Wales Kidney Research Unit held an Open Day in March 2018 to showcase their research to medical staff and members of the public.

Members of the Wales Kidney Research Unit were able to engage with patients, their families and a variety of hospital staff over lunch. Visitors saw cell culture laboratories and images of cells in culture and experienced a variety of engagement activities designed and developed in partnership with Techniquest.

Professor Donald Fraser, Clinical Professor, explained about the on-going clinical trials and the benefits to the community. A selected number of researchers had the opportunity to discuss the direction of future research projects with visitors and receive informed feedback. Participants also took the opportunity to ask questions and find out how to get involved.

One of the themes of the Open Day was to increase lay involvement in Wales Kidney Research Unit research. Currently two patients review grant applications and bids to Welsh Government, giving comments on content and the focus of the proposals from a patient's perspective. At the Open Day, participants asked questions about the role of lay advisors and many have since signed up to get involved.

The team are now planning to have regular meetings involving members of the public and patients to discuss the latest research proposals and give patients the opportunity to inform the research focus of the WKRU.

Reach:

- Kidney patients, their families, carers, nurses, dialysis technicians and members of the Kidney Wales Foundation charity.

Impact:

- Increased awareness of the progress and benefits of WKRU research
- Patient and visitor involvement in discussions about ideas for different grants within WKRU.
- Additional volunteers attracted to act as Lay Faculty members
- New relationships built at the event for future events

Project Sepsis

A multidisciplinary team of scientists and clinicians spear-headed by Professor Peter Ghazal and supported by Dr Widad Dantoft are working on how to de-mystify sepsis. The team have embraced a community in action approach, involving the public, patients, parents to patients, researchers, clinicians, students as well as charitable organisations, the Sepsis Trust UK and industry to provide information about what sepsis is, how to diagnose it and how to treat it.

A focal point for the community in action is the establishment of a multipurpose Sepsis Engagement Centre, that uniquely combines a public engagement space exhibiting intensive care units for neonates (NICU), children (PICU) and adults (ICU), named the *"The Goldilocks Ward"*. The area will train clinicians as well as medical and nursing students, and includes state of the art manikins simulating sepsis in a premature baby, a child and an adult. Further plans are afoot for developing "*digital patients*" that will be embedded in a "data-lake" for complex systems modelling and predictive simulation research.

A central part of *Project Sepsis* has been public involvement though the formation of a Lay Advisory Group, made up of survivors of sepsis or those with an associated interest in the infection. The Lay Group advises on lay summaries and the direction of research and priorities for the Project Sepsis team. The lay group also helps inform how the Goldilocks Ward can be helpful for those seeking more information about a loved one with sepsis and for acquainting a visiting family member in an Intensive Care Unit with the equipment surrounding the hospital bed. In many cases symptoms have been difficult to pick up or missed, so an essential part of Project Sepsis is engaging with clinical practitioners, nurses, doctors, midwives and medical students to increase awareness for early diagnosis and increase readiness and resilience amongst clinical staff.

Reach:

- Involvement in all public engagement events organised within the Systems Immunity Research Institute and the School of Medicine Engagement team
- Linking with Clinical practitioners, nurses, doctors, midwives and students
- Public involvement in the newly established Lay Advisory Group
- Tailored engagement events targeting the general public and school classes (pupils from primary and secondary schools visiting the Sepsis Engagement Centre). This will increase the knowledge and awareness about sepsis within the community.
- Public outreach with increased awareness and knowledge amongst family members of Intensive Care patients with sepsis.

Impact:

- Increased public awareness through engagement events and information sheets about sepsis
- Reduced distress for family members visiting someone in Intensive Care as a result of information packs detailing some of the equipment surrounding the hospital bed
- A faster and more accurate diagnosis of sepsis
- Help limit the over use of antibiotics
- Save lives

Superbugs – The End of Modern Medicine As We Know It?

Researchers from the Systems Immunity Research Institute teamed up with Techniquest to raise awareness of the global health challenges associated with antimicrobial resistance and to promote the world-leading research conducted at Cardiff School of Medicine.

This event formed part of the Wales Festival of Innovation fortnight, and was co-ordinated by Dr Matthias Eberl.

The evening event at Techniquest was held on 28th June, and attendees were offered a range of information and demonstrations about anti-microbial resistance and super bugs to raise awareness, and shown how the human body fights 'bad' germs and uses 'friendly' germs to keep us healthy.

Participants learned how antibiotics work, they were shown cutting edge research into antimicrobial resistance (AMR), explored common misconceptions including those around vaccines and decoding the early signs of sepsis.

Scientists and doctors were on hand to discuss how to tackle the ever-growing antibiotic resistance and the worldwide spread of untreatable infections.

Reach:

- The event was attended by over 300 members of public of all ages
- Involvement of patient focus groups, charities (UK Sepsis Trust) and industry (ABPI)
- 171 visitors completed the sticker "treasure hunt" evidencing participation in 1539 activities

Impact:

- An increased awareness of the challenges associated with antimicrobial resistance and infection
- An increased profile of Cardiff-led research into antimicrobial resistance
- A demonstration of strong engagement and involvement activities
- The development of a closer strategic partnership with Techniquest
- A contribution to further research related to AMR, drug discovery, antibiotic prescription, infection diagnostics and sepsis
- Consideration by students of a career in research at Cardiff University

Public Engagement and Public Involvement in the Division of Population Medicine

The Division of Population Medicine aims to improve population health, wellbeing and patient care. This is achieved through a commitment to delivering research that makes a difference to people's lives and which has an impact within the community.

Key areas of focus include child health and wellbeing, common infections, long term conditions and cancer, and cover six themes:

- medical statistics and epidemiology
- screening prevention and early diagnosis
- healthcare and behaviour interventions
- collaborative healthcare
- quality improvement and patient safety
- palliative and supportive care

PRIME Centre Wales is based within the Division and is the centre for research in primary and emergency care. It is funded by the Welsh Government through Health and Care Research Wales. Public and patient involvement is key to the work of PRIME, ensuring PRIME addresses the issues most important to the public, and most likely to make the biggest impacts in improving patient care.

In 2017, PRIME Centre Wales recruited members of the public and patients to join a new lay member 'SUPER' group. SUPER stands for Service Users for Primary and Emergency care Research. SUPER members work with researchers to support research development. SUPER members also attend conferences and workshops to promote public involvement in research.

Case Study Examples:

Lung Cancer Screening and Prevention PhD project

This research project, still in its early stages, focuses on engaging high-risk groups in lung cancer screening and prevention.

Pam Smith is known to be the first PhD student at Cardiff School of Medicine to have a public involvement focus within her PhD project. Two 'Research Partners' have been recruited who are members of the community and have a lived experience of lung cancer as well as being either current or former smokers. Part of their role will be to help develop information sheets and questionnaires, ensuring that the language and terminology is understandable to the participants of the study. As Research Partners they will also use their local knowledge and contacts to recruit further participation in the research.

Reach:

- A number of hard to reach individuals in disadvantaged community settings
- Availability of information sheets, consent forms and questionnaires written in an easy to read format which will make the research more approachable and understandable
- Opportunity for individuals to become Research Partners and to assist in the development and implementation of the research

Impact:

- A better understanding on how to engage high risk groups in lung cancer screening and smoking cessation
- This research will build the evidence base for CT lung cancer screening in the UK, providing critical evidence for the implementation of lung screening/prevention interventions to reduce inequalities and improve lung cancer survival outcomes

HealthWise Wales

HealthWise Wales is a project based in the Centre for Trials Research creating a partnership between researchers and the public. Public and patient involvement is an important component of every aspect of HealthWise Wales involving the public in consultation and in collaboration with the project management. Members of the public sit on the Board of HealthWise Wales and act as 'critical friends' scrutinising and giving feedback on a range of issues.

When researchers have a new questionnaire, the Board review it, give feedback and provide suggestions to improve the questionnaire and ultimately the results.

New members are recruited via HealthWise Wales, which also recruits 'Champions'. Part of the Champion's role is to promote a study to other members of the public, and they can comment on the model, give feedback on how the study is going, resource stands at events and shows and may even give talks and presentations. Champions are also able to help with the wording of leaflets to ensure they are written in a way that can be understood by the public.

One member has co-authored a publication about HealthWise Wales Champions and how the model worked in the community.

The public are also accessed via Facebook and face to face in the street, to ascertain where they feel research efforts should be focused. HealthWise Wales has a register of over 20,000 participants who are ready to take part in research studies and aims to increase this to 100,000 by 2020.

Reach:

- By involving members of the public on the Board and as Champions, the ability to communicate with the community is greatly increased

Impact:

- Raising awareness and educating the public on a range of health issues
- The opportunity for members of the public to support research
- Researchers can obtain feedback on where to direct their research
- The language used in leaflets is more readily understood by members of the public

Public Engagement and Public Involvement in the Division of Cancer and Genetics

The Division of Cancer and Genetics has several areas of focus including how to:

- drive research for the benefit of patients affected by cancer and inherited disease in Wales and beyond. Translational research focuses on the genetic and molecular basis of human disease with a particular interest in cancer and inherited conditions
- understand the genetic basis of disease with a focus on cancer and inherited conditions
- understand the mechanisms of tumour initiation and progression
- employ information from basic and clinical studies to develop new diagnostics and therapeutic approaches in cancer and inherited conditions
- understand the genetic basis for inter-individual variations in therapeutic response.

Cancer researchers within the Division immerse themselves in a broad range of engagement activity, using a variety of vehicles to bring their research to life for the public. Pupils have been engaged via a board game called Suppress the Mess, which has been developed to explain the spread of cancer, and this has been played in schools across Wales. Another activity targeted at children is Art in Science, a project that invited school children for a tour of the immunology labs. The children produced art which was inspired by this visit and it was subsequently displayed in a gallery.

Laboratory tours are a regular feature within this Division, especially when researchers have received funds from charities – the tour participants are often fundraisers.

Researchers experience great success in working with other organisations and festivals to explain their work and have engaged with thousands of members of the public at locations such as Techniquest, the Green Man festival and the Eisteddfod.

Case Study Examples:

Wales Gene Park

Wales Gene Park (WGP) is part of the Division and delivers an innovative, high-quality programme of genetics and genomics-related education and engagement activities and facilitates opportunities for patient and public involvement in research, service development and health and social care policy.

The varied programme covers four groups – health professionals, schools/colleges, patients and families, and the general public.

Core activities include:

- Education and engagement events for schools/colleges and the public which include talks, lectures, roadshows, conferences, film screenings and dedicated genetics networks
- Continuing Professional Development-approved initiatives in genetics and genomics for healthcare and other professionals, such as national and international conferences, study days and workshops
- Patient and public input to Welsh Government policy relating to genetics and genomics and, more broadly, health and social care
- Recruitment to Health and Care Research Wales and National Institute for Health Research clinical research studies
- Involvement opportunities for patients and families affected by rare and genetic conditions

WGP's well-established programme benefits the School of Medicine, and Cardiff University as a whole, by:

- Raising its profile at events, including national/international conferences, school, public and patient events
- Promoting its research to wide audiences
- Facilitating researchers and students to undertake public engagement activities by providing opportunities, and training, to participate
- Raising awareness of genetics and genomics amongst students through educational sessions
- Facilitating Public and Patient Involvement
- Contributing to School, College and University-wide initiatives

In 2017, Wales Gene Park delivered 71 events and participated in an additional 13 events organised by others.

How to train your Oncolytic Virus

The British Society for Gene and Cell Therapy hold an annual Public Engagement Day at the University Museum of Natural History in Oxford.

A team of researchers, led by Dr Alan Parker have successfully 'trained' a respiratory virus to recognise ovarian cancer and completely destroy it without infecting other cells. The research was promoted at the event where they resourced a stand where students and pupils were able to build their own "customised" adenovirus, 1 million times bigger than the real thing.

Alan also delivered a talk entitled 'How to train your Oncolytic Virus.'

Reprogrammed viruses are already being used in gene therapy procedures to treat a range of diseases, demonstrating they can be trained from being life-threatening into potentially lifesaving agents. They could also be used to treat other cancers such as breast, pancreatic, lung and oral.

During this event the pupils had the opportunity to learn more about research, science, health and wellbeing and how research continues to explore new ways of improving the health of the nation.

Reach:

- 400 people, 90% of whom were pupils and students undertaking GCSEs and A Levels

Impact:

- To help students, teachers and family members to learn about research
- To raise awareness
- To encourage the public to give to charity for funding further research
- To support CRUK funding, Tenovus, Cancer Research Wales, Life Sciences Network Wales, etc

Wales Cancer Research Centre

International Clinical Trials Day is remembered on 20th May each year and The Wales Cancer Research Centre celebrates with a day of public engagement activities. This is done in collaboration with the charity Cancer Research UK.

The event highlights the range of research that is currently on-going and gives members of the public the opportunity to hear about the latest research through presentations, tours of research facilities and interactive activities.

Last year patients and their families attending clinics at Velindre Cancer Centre were encouraged to take part in a range of activities and complete a survey. At the University Hospital of Wales, an open day was held at the Clinical Research Facility, and a social media campaign ran throughout the week preceding 20th May to promote the importance of cancer research.

Reach:

- Patients, their families, laboratory researchers, nurses and other staff (approx. 50 in total) came for a tour of the facilities
- 80 surveys were completed at Velindre and a far higher number took part in the activities
- Broad reach to a wider audience on social media

Impact:

- An opportunity to educate people and to raise awareness about the current research that is taking place
- Prompted patients to ask their Clinician about Clinical Trial opportunities
- Increased networking opportunities for researchers
- Pupils and students who attended were able to explore career options
- Promotion of a collaboration between a Welsh Government funded Centre and the charity sector.

Tackling Cancer Together

As an innovative way of bringing information to the public, the Wales Cancer Partnership held a fun, engaging and inspiring event in the centre of Cardiff last November. The aim was to highlight and raise awareness of the excellent cancer research, services and care that is available in Wales.

Based in the Old Library, researchers from the Division of Cancer and Genetics in the School of Medicine together with a number of cancer charities teamed up to provide information on prevention, early diagnosis, treatment and support, complemented by a number of talks.

There were interactive stands, enabling members of the public to learn about current research in areas such as 'Transforming Cancer treatment with cutting edge research,' the latest from the Clinical Trials Unit and a hands-on opportunity to 'Make an Oncolytic Virus'.

Reach:

- 23 different organisations attended the event and worked together for a common goal
- The event was attended by over 100 members of the public
- Members of the public had the opportunity to meet and have conversations with local cancer researchers and professionals

Impact:

- An increased awareness and understanding about basic clinical cancer research and its impact
- Promotion of cancer prevention and healthy lifestyle messages
- Networking for researchers, professionals, carers, supporters and patients
- Showcasing excellent local research and good practice

Central Biotechnology Services

Central Biotechnology Services (CBS) is an ISO 9001:2015 certified Cardiff University Technology Facility. Based in the College of Biomedical and Life Sciences it has a remit across the entire College and is part of the Clinical Innovation Partnership between Cardiff and Vale University Health Board and Cardiff University. One of the key activities of CBS is to conduct project work with businesses on a contract basis and facilitate links between Cardiff University researchers and industry.

Beyond these engagement activities CBS also host companies in their laboratories and are currently hosting TeloNostiX which is a spin-out company from Cardiff University. CBS has been chosen to host TeloNostiX so that the company can benefit from the expertise and accreditation that CBS has in Quality Management.

TeloNostiX has developed a prognostic tool that helps clinicians and patients understand the likely need for treatment and choose the most appropriate course. The test can forecast the outcome of common cancer types like breast cancer and Chronic Lymphocytic Leukaemia (CLL). It is based on analysing the length of telomeres - caps found at the ends of chromosomes that protect genetic information from damage and is known as Single Telomere Length Analysis (STELA).

The interaction between CBS and TeloNostiX represents a good example of CBS engagement activity with companies and in facilitating reach and impact of Cardiff research activity. TeloNostiX also picked up the 'People's Choice' Award at Cardiff University's 20th Anniversary Innovation and Impact Awards 2018.

Reach:

- Patients, researchers, clinicians and eventually medical students

Impact:

- Raising awareness of how research is continuously changing and improving
- Cancer patients and clinicians being able to make better informed decisions about treatments
- Research being applied to tackle societal challenges
- Commerce linking with academia and creating positive changes and economic growth

Public Engagement and Public Involvement at the Division of Psychological Medicine and Clinical Sciences (DPMCN)

The DPMCN hosts a number of groups, including the MRC Centre for Neuropsychiatric Genetics and Genomics, the Neuroscience and Mental Health Research Institute, the National Centre for Mental Health, the Brain Repair and Intracranial Therapeutics Unit and the Dementia Research Institute

The Division's research aims to better understand the fundamental mechanisms underlying major psychiatric and neurological disorders, including schizophrenia, bipolar disorder, ADHD, Alzheimer's disease and Huntington's disease.

There is a major focus on genetics and genomics but also interest in brain imaging, epidemiology, animal models and cell biology.

Case Study Examples:

National Centre for Mental Health (NCMH)

One of the initiatives within NCMH is PAR, which is the Public Involvement Group originally formed in 2009. This gives people with lived experience a voice in shaping mental health research in partnership with researchers.

Since its inception, the group has had many successes with individuals facilitating a workshop to look at research priorities for mental health service uses, individuals taking advisory positions in research projects and even one member embarking on their own PhD.

Reach:

- Members of the public in the South Wales area, particularly those with a condition or family member of someone suffering from a condition which is being researched by NCMHs
- Clinicians, students, researchers involved with Mental Health research

Impact:

- Meeting with researchers and generating research ideas
- Providing feedback on research proposals and grant applications
- Attending events where involvement in research is promoted

Neuroscience and Mental Health Research Institute (NMHRI)

Each year the NMHRI hosts the Wales Brain Bee, an annual event based on The International Brain Bee, a not-for-profit neuroscience competition funded by Dr. Norbert Myslinski.

The aim of the Brain Bee is to motivate teenagers to learn more about the brain than they would ordinarily do within the A-Level Biology curriculum and to inspire them to consider a career in neuroscience.

It consists of a mix of practical lab work, video clips and written exercises that will encourage students to learn more about one of the most complex structures in the universe – the human brain.

Each year, teams of up to 10 students from a number of schools and colleges compete in a series of challenges and a multiple choice written test. The highest scoring school or college will be awarded the Wales Brain Bee shield, with prizes of gift vouchers worth £50, £25 and £10 for the 1st, 2nd and 3rd place students.

Reach:

- School children across South Wales studying biology at AS level

Impact:

- Greater awareness for school children of how the brain works
- Opportunity for school children to speak with PhD students and early career researchers about a career in neuroscience

Medical Research Council Centre for Neuropsychiatric Genetics and Genomics (MRC CNGG)

MRC Festival

The third annual MRC Festival of Medical Research was held 14th – 24th June 2018.

The MRC Festival took place in England, Scotland and Wales, online and in Africa where a wide range of free public activities involving scientists from research establishments, including MRC units, centres and institutes, showcased MRC-funded research.

In Cardiff, the MRC Centre hosted a science-themed funfair at the DEPOT, and created a new and exciting event, adapting some traditional amusements to reflect areas of research, including Hook-a-duck, Play Your Genetic Cards Right, mini-golf and giant Jenga.

The evening also included talks on genetics and schizophrenia, sleep and mental health, neuroimaging and multiple sclerosis.

Reach:

- Members of the public from in and around Cardiff (82 attendees)

Impact:

- Raised awareness of a variety of conditions, including PTSD, schizophrenia and multiple sclerosis
- Raised awareness of a variety of research techniques including stem cell differentiation and CRISPR gene editing
- Trialled a number of new activities that can be re-used for a variety of audiences

Summer School in Brain Disorder Research

The MRC CNGG Summer School is an annual course spanning four days. Each year it welcomes more than 40 attendees offering them the chance to learn about ground-breaking brain disorder research.

The school boasts talks from some of the most respected researchers in their respective fields of psychiatry and neuroscience, including Professor Sir Mike Owen and Professor Michael O'Donovan.

Open to clinical trainees and non-clinical scientists, the course is a great opportunity for those with an interest in moving into the field of neuropsychiatric genomics and genetics or those seeking an introduction to brain disorders research.

As well as talks the course includes demonstrations and interactive sessions on a range of topics in psychiatry, neurology and neuroscience. These include:

- Neuroimaging
- Psychiatric epidemiology
- Genetics and epigenetics
- High-throughput sequencing demonstrations
- Manipulation of stem cells
- Phenotypic assessment
- Ethics in genetic research

There are also workshops offering information and advice on scientific careers and academic fellowships, and an opportunity for students, scientists and clinicians to come together and share their knowledge and discuss possibilities for collaboration.

The summer school has hosted people from all over the globe with previous attendees travelling as far afield as Canada and the US.

Reach:

- Newly qualified health professionals and researchers from across the world, as well as some more senior attendees who are looking to change direction in their careers. (38 attendees)

Impact:

- Raised awareness of the research taking place at MRC CNGG in Cardiff.
- An opportunity to advertise the centre to prospective PhD students.

Conclusion

This report highlights the numerous and varied approaches to public engagement and involvement throughout the School of Medicine, demonstrating its commitment to deliver the University's Way Forward Civic Mission sub strategy.

The continued impact of these activities enables the School of Medicine to keep members of the public engaged with the on-going research that is taking place, and encourages a continued increase in a broad and diverse public getting involved in the School's research, identifying areas of patient need and helping to shape the future direction of research.

Additionally, our engagement work with primary and secondary Schools across Wales is recognised to support teachers to improve educational attainment by getting children excited about science and bringing theory to life.

It is envisaged that the breadth and depth of this combined activity will continue to develop, producing high quality research impact for the School of Medicine, as well as realising additional priority targets including increasing the numbers of Welsh domiciled students applying to study medicine in Wales.

To find out more about our public engagement and involvement work, please contact;
medicengagement@cardiff.ac.uk