

# Bulletin

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# QUEEN'S UNIVERSITY BELFAST FIRST TO TRANSFORM THE WAY DISCOVERY IS TRANSLATED INTO PATIENT CARE

For every 100 occasions that scientists across the world announce a discovery that can have significant impact in patient care, less than 1 makes it into a product that is eventually useful for patients in our healthcare service.

The £10million Queen's University Belfast Centre of Excellence in Precision Medicine (PMC) aims to change this by making the translation of discovery into clinical care faster, more targeted and more efficient in predicting a cancer patients' response to treatment.

The PMC at Queen's University will become the first precision medicine centre in the UK to integrate multiple technologies and analytical tools to accelerate the speed by which research discoveries are translated into real scientific applications to provide better and longer lives for cancer patients.

The PMC is partnering and collaborating with industry, academia and healthcare

organisations to integrate high-throughput genomics, digital pathology, clinical data and deep-learning algorithms to capitalise in the value of integrated clinical and biomarker information to improve patient's outcome. This is a unique development in the UK, and possibly globally, which will allow potentially costly drugs to be used more effectively by being prescribed only to those that can benefit from them.

The PMC has already had great success in collaboration with PathXL, a local spin-out from Queen's University, by developing the first generation of TissueMark®. This pioneering technology is used to analyse cancer tissues ahead of detailed molecular testing.

Professor Manuel Salto-Tellez, Chair of Molecular Pathology at Queen's University Belfast said, "After the 'molecular revolution', the introduction of artificial intelligence in diagnostic and therapeutic medicine represents a new frontier, and digital pathology is one of its most obvious applications. The Queen's University Centre of Excellence in Precision Medicine has experience in helping industry to bring new digital pathology diagnostic algorithms to the market and, together with our capacity in genomic medicine, represents an unparalleled opportunity to engage in true, integrated analyses to support industry product development, clinical trials and research."

Director of the NI Biobank, Dr Jackie James, explained: "The Northern Ireland Biobank (NIB) is more than a repository of samples, it is a true repository of science. Broadly integrated in the Molecular Pathology programme at Queen's University Belfast and part of this PMC, the NIB has already provided retrospective materials and bespoke collections that have allowed industry to carry our discovery and validation of products currently in the market."

Queen's University Belfast is at the forefront of molecular pathology, biomarker validation and test adoption in the UK. As Professor David Gonzalez de Castro, Professor of Genomic Medicine, said: "We are witnesses to the genomic revolution that is transforming our understanding of human disease in general, and cancer in particular. Harnessing the power of the latest technologies we are now able to select the right targeted treatments and the concept of precision medicine is now a reality for many oncology patients. Our aim is to advance the clinical applications of cancer genomics to every patient and significantly improve their outcomes and quality of life."

Queen's University Centre of Excellence in Precision Medicine laboratory is funded by Invest NI, Queen's University Belfast and the NI Health and Social Care Trust, and will open in Early Autumn 2018. It is currently seeking to fill the 14 diverse roles to cover all aspects of the validation of research findings applicable to cancer sufferers.



The Queen's University Belfast Precision Medicine Centre of Excellence by night

### HUNDREDS OF THOUSANDS OF LIVES COULD BE SAVED FROM DISEASE IN LOW AND MIDDLE INCOME COUNTRIES SAYS QUEEN'S GLOBAL HEALTH EXPERT



Professor Mark Lawler (second from right) with international colleagues and Sabine Kleinert (fourth from left), Senior Executive Editor, the Lancet at the launch of the Lancet Series on Lancet Series on Pathology and Laboratory Medicine in Low- and Middle-Income Countries during the Consortium of Universities for Global Health Conference in New York

Hundreds of thousands of lives could be saved from disease in low and middle income countries according to an academic from Queen's University Belfast.

Professor Mark Lawler, from the Centre for Cancer Research and Cell Biology at Queen's University Belfast, together with other international experts, have highlighted the critical need for significant improvements in Pathology and Laboratory Medicine services and infrastructure to drive better quality healthcare for the billions of citizens worldwide who are living in resource-limited settings.

Speaking from New York, where the Lancet Series on Pathology and Laboratory Medicine in Low- and Middle-Income Countries was being launched, Professor Lawler, said: "Pathology and Laboratory Medicine are the tools we use to ensure accurate, early diagnosis of disease, make timely decisions on therapeutic interventions and assess the success of those treatments. If we don't have good quality pathology services, we risk the lives of hundreds and thousands of people in resource limited settings."

The expert group published a series of eight recommendations, which if implemented would deliver modern high quality affordable Pathology and Laboratory Medicine services in low and middle income countries by 2030. They also issued a "Call to Action" for all stakeholders to come together in a Global Alliance to ensure timely implementation of their recommendations. Lancet Series Lead Dr Kenneth Fleming, University of Oxford, UK, and National Cancer Institute, USA said: "In Europe or the USA, we take for granted that if you see your doctor with symptoms of liver disease, you will be diagnosed based on a blood test, and given the correct treatment. Similarly, we wouldn't dream of diagnosing breast cancer without performing a biopsy. But, in far too many countries around the world, diagnosis and treatment can be based on no more than a good guess."

Research presented in the Lancet Series highlights the key critical gaps in low and middle income countries: insufficient pathologists; inadequate education and training; poor infrastructure and a lack of quality assurance.

Dr Shahin Sayed, Aga Khan University Hospital, Nairobi, Kenya and Secretary General of the College of Pathologists of East Central and Southern Africa said: "There is an urgent need for nations to recognise that lack of access to adequate pathology is a critical gap in health systems in resource-limited settings; without immediate and sustained intervention, this gap will only widen disparities between poor countries and rich countries."

New technologies can significantly enhance service delivery, if used appropriately. Professor Lawler who is senior author on Paper 3 in the series said: "Exciting developments in Point of Care Testing (POCT) and molecular technologies are lessening requirements for sophisticated laboratory equipment and specialist laboratory skills in resource-limited settings, thus facilitating rapid test results so that patients are screened and treated on the same day. However, while POCT can allow low and middle income countries to bypass or "leapfrog" poorly functioning laboratory systems, it must only be provided as part of an overarching National Laboratory Strategic Plan. Unregulated, inaccurate, POCT will only worsen the situation – so Look before You Leapfrog."

Professor Sue Horton, University of Waterloo, Canada said: "Economic studies are essential to determine whether POCT is affordable, costeffective, and an appropriate component of a well-functioning system in resource-limited settings. New diagnostic tests will be most relevant if they and their accompanying new treatments are within the financial reach of patients in low and middle income countries".

Professor Chris Elliott, Pro Vice Chancellor, Faculty of Medicine Health and Life Sciences at Queen's said: "This landmark series in the Lancet, one of the most prestigious medical journals in the world, highlights the role that Queen's is playing in driving improvements in health at a global level and resonates strongly with our One Health Agenda."

Professor Richard English, Pro Vice Chancellor for Internationalisation and Engagement at Queen's said: "Working with partners in low and middle income countries represents a key way in which Queen's can bring its valuable expertise to bear in addressing truly global challenges that affect people's lives."

Professor Lawler added: "The time to act is now. Addressing our recommendations and ensuring immediate investments in Pathology and Laboratory Medicine represent the most impactful approach to deliver better healthcare across low and middle income countries and save hundreds of thousands of lives."

- Access to pathology and laboratory medicine services: a crucial gap www. thelancet.com/journals/lancet/article/ PIIS0140-6736(18)30458-6/fulltext
- Improving pathology and laboratory medicine in low-income and middle-income countries: roadmap to solutions www. thelancet.com/journals/lancet/article/ PIIS0140-6736(18)30459-8/fulltext
- Delivering modern, high-quality, affordable pathology and laboratory medicine to lowincome and middle-income countries: a call to action www.thelancet.com/journals/ lancet/article/PIIS0140-6736(18)30460-4/ fulltext

# **CCRCB OPEN DAY**



As part of Science Festival 2018, Saturday 17 February saw the third CCRCB Open Day, where we welcomed visitors of all ages into the Centre to celebrate a decade of cancer research in Belfast. Attendees included patients and their families, supporters of the charities who fund research in the CCRCB and the general public.

Attendees could choose from a wide range of activities throughout the building. Senior scientists offered talks on the latest research updates in their particular speciality. There were lab activities, which also included informal chats with a researcher. Visitors were able to talk to the CRUK cancer research nurses and members of the NI Cancer Research Consumer Forum about clinical trials. Epidemiologists from the Centre for Public Health also had a stand where they had activities aimed at raising awareness of cancer prevention through lifestyle changes and provided information on supporting and preparing patients for cancer treatment and the NI Biobank provided details on consenting human tissue for research. Our science interactive activities for all ages included the genetic taste test, turning your smartphone into a microscope and designing your own lab coat, to name but a few.

Representatives from the cancer charities and funders – Brainwaves NI, Cancer Focus NI, Cancer Research UK, Friends of the Cancer Centre, Leukaemia & Lymphoma NI, Oesophageal Patients Association, Prostate Cancer UK, QUB Foundation and the HSC R&D Public Health Agency – all showed their support by having information stands and volunteers at the event.

The CCRCB Open Day Working Group, who organised the event, would like to thank everyone who participated and everyone who attended the Open Day. Great to see a wide range of research and support from the cancer charities Very informative event, even for a nonscientist. My kids really enjoyed this morning







A wonderful morning, it's great to see so many passionate scientists and charities working together

### RESEARCHERS AT QUEEN'S LEAD 'PERSONALISED MEDICINE' APPROACH TO IMPROVE QUALITY OF LIFE FOR BOWEL CANCER PATIENTS





Researchers from Queen's University Belfast have demonstrated for the first time how molecular analysis of clinical trial biopsy samples can be used to help clinicians identify the key changes that occur in an individual patient's bowel (colorectal) tumour prior to surgery, so clinicians can better understand and treat the disease.

It is thought that this 'personalised medicine' approach could ultimately improve the prognosis and quality of life for bowel cancer patients.

The Queen's led study, in collaboration with the University of Turin, University of Oxford, the University of Leeds and a number of clinical trial centres across the UK, demonstrates how personalised medicine can be successfully used to help improve outcomes in ongoing clinical trials.

For clinicians, identifying which bowel cancer patients are likely to respond to different types of treatment can be particularly challenging. Dr Philip Dunne, Senior Research Fellow from the Centre for Cancer Research and Cell Biology at Queen's and joint senior author on the study explains: "There are approximately 1.4 million cases of bowel cancer diagnosed annually worldwide, with 41,000 cases in the UK each year. A number of treatment options are available but mortality rates remain high, with bowel cancer the second most common cause of cancer death in the UK.

"In order to develop better treatments for individual patients, we must first understand the biology of that person's tumour; this is the basis of personalised medicine in cancer. Advances in molecular and genetic analysis in the past 10 years have markedly improved our biological understanding of colorectal cancer, although this increased knowledge is yet to significantly change standard patient care. This study highlights how we can begin to use this new understanding developed in research laboratories, to identify the biology underlying an individual patient's tumour in the clinic; the 'bench-to-bedside' approach."

The research study has been published in the prestigious Journal of Pathology, the world's highest ranking journal in the field of molecular pathology.

Matthew Alderdice, a postdoctoral fellow on the project and first author on the study added: "Although molecular analysis is routinely carried out in research laboratories from large surgically removed tumours, in current clinical practice the tissue available for clinical decision-making may only be the initial small tumour biopsy tissue. This study highlights how a precise understanding of the genetic changes that occur within this biopsy material is crucial to both understanding and treating the disease."

Professor Mark Lawler, Chair in Translational Cancer Genomics at Queen's commented: "Molecular studies have indicated that a 'one size fits all' treatment approach for bowel cancer isn't a viable option if we are to effectively tackle this disease. We have demonstrated the ability of molecular classification systems to stratify patients based on their molecular make-up in a series of colorectal biopsy samples obtained during a phase II clinical trial. The ultimate aim of this work is to allow patients to receive a more tailored disease management plan based on the specific biology of their tumour. Thus, we can tailor treatment to the individual patient, maximising its effectiveness while minimising potential side effects."

This research study is part of the Stratification in Colorectal Cancer (S:CORT) consortium led by Professor Tim Maughan, from the University of Oxford and funded by a grant from the Medical Research Council (MRC) and Cancer Research UK (CRUK) as part of the MRC's stratified medicine initiative. Professor Tim Maughan, Professor of Clinical Oncology at the University of Oxford and Principal Lead of the S:CORT Consortium said: "This work highlights the benefit of a UK wide approach, bringing together the collective expertise within our consortium to drive new approaches to improve bowel cancer outcomes. Our S:CORT Consortium is gaining new insights into the key factors that influence bowel cancer development and its treatment and using this knowledge to maximise best treatment and quality of life for bowel cancer patients."

S:CORT involves key partnerships with patients and patient advocacy groups. Ed Goodall, a survivor of bowel cancer and a member of S:CORT explains: "As patients, we are delighted to be involved in this work at a meaningful level, giving our opinions in relation to the scientific approaches that are undertaken within the consortium. As a citizen of Northern Ireland it is also extremely exciting to see the excellent work that is being done by researchers at Queen's University."

Deborah Alsina MBE, Chief Executive of Bowel Cancer UK and Beating Bowel Cancer, the UK's leading bowel cancer charity and a partner in S:CORT, said: "We are delighted to be associated with this research. Our recent Critical Research Gaps in Colorectal Cancer Initiative highlighted the need for better research collaboration. This is an excellent example of the best UK science and clinical care in bowel cancer working together to develop innovative approaches to save more lives."

The research paper is available from the Journal of Pathology: http://onlinelibrary. wiley.com/doi/10.1002/path.5051/abstract

# CCRCB WELCOMES ST ITA'S PRIMARY SCHOOL

The Stratified Medicine Group (SMG), Queen's University Belfast welcomed School Children from St Ita's Primary School, Class 6 on Friday 23 February 2018 to an Engagement event, held during the annual NI Science Festival and as part of the wider CCRCB outreach programme at the Health Sciences Building.

The event was kindly organised with help from Dr Nuala McCabe, Angelina Madden, Maria Rea and Caroline Crothers CR-UK Engagement Officer. The event started with a short presentation "Discovery to Recovery" with emphasis on the importance of research in the development of targeted therapies translating to improved treatment outcomes for cancer patients. The programme of interactive activities was discussed, with SMG colleague's either demonstrating or providing lab tours throughout the morning which was fun for both the children and demonstrators!

Some of the science themed activities included Strawberry DNA Extraction, Constructing a Jelly Baby Helix and a Harry Potter themed Potions masterclass to educate and inspire! In the latter children were transported to Hogwarts to create a



Pupils from St Ita's Primary School constructed a large DNA helix

lava lamp with ingredients such as cooking oil, food colourings, water and the magic ingredient Alka Seltzer, to preparing colourful cornflour slime.

Before leaving all the groups added their sections of DNA together to create

one large DNA helix which was really impressive! The children enjoyed the lab tours to experience the work that goes on within Cancer Research in the SMG lab, and were given goody bags with a DNA quiz to apply the knowledge they acquired, the day was a Great success!

# SUCCESSFUL BREAST CANCER CLINICAL TRIALS SHOWCASE

The NI Cancer Trials Network (NICTN) were delighted to welcome over 50 attendees to a Breast Cancer Trials Showcase held in CCRCB on 14 November 2017. The event, chaired by Mr Stuart McIntosh, NICTN Deputy Clinical Director, brought together national trial leads, breast cancer MDT members from across the region, scientists and patient/ carer representatives from the NI Cancer Trials Forum (NICRCF). Visiting speakers included Professor Daniel Rea, University of Birmingham, Chair of the NCRI Breast Clinical Studies Group, Miss Cliona Kirwan, University of Manchester and Professor Rob Stein. UCHL. The event led to lively discussion in relation to a range of issues following excellent presentations on clinical trials in the setting of personalised treatment in breast cancer:

ROSCO: Is there a role for CEP17/TOP2A testing in selecting anthracycline or taxane chemotherapy as neo-adjuvant chemotherapy for early breast cancer?

LORIS: Is active monitoring non-inferior to surgery in non-high grade DCIS, in terms of ipsilateral invasive breast cancer free survival time?

PRIMETIME: The risk of ipsilateral invasive breast disease following selection of women categories as very low risk by IHC4+C to direct selective avoidance of breast radiotherapy? OPTIMA:



Speakers with some of the attendees at the Breast Cancer Trials Showcase

Does multi-parameter analysis directed treatment assignment reduce chemotherapy use for patients with hormone sensitive primary breast cancer without detriment to recurrence and survival?

Trial decision aids and the challenges of patient recruitment to trials of less treatment were also presented. Margaret Grayson, Chair of the NICRCF, stated that patients wanted to hear about clinical trials but highlighted the findings of the NI Cancer Patient Experience Survey that reported clinical trials had not been discussed with the majority of patients. The final speaker, Dr Carmel Conefrey, concluded with a comment that had been a recurring theme throughout the afternoon – a cohesive MDT is key to facilitating recruitment to clinical trials.

NICTN wish to thank Roche who kindly supported catering for the event. They also wish to thank staff from NICTN, NIB and CRUK for information stands, and Caroline Crothers, CRUK Research Engagement Manager, for supporting event coordination.

# QUEEN'S IN £54 MILLION FUNDING INITIATIVE TO TRANSFORM HEALTH THROUGH DATA SCIENCE

Health Data Research UK has selected six sites across the UK to address challenging healthcare issues through use of data science. Each site has world-class expertise and a track record in using health data to derive new knowledge, scientific discovery and insight. Queen's University Belfast will work with Swansea University (led by Professor Ronan Lyons) as one of these substantive sites, using its expertise in data science to drive advances in precision medicine and public health in close partnership with NHS bodies and the public, in order to translate research findings into benefits for patients and populations.

Professor Mark Lawler, QUB Lead on the Programme said "I am delighted that we have been chosen as a Substantive site for this exciting new initiative. This research will be a game-changer in driving new knowledge to combat common diseases including cancer, asthma and eye disorders and will allow us to use Big Data to save people's lives."

From April this year, the six sites will work collaboratively as foundation partners in Health Data Research UK to make significant improvements in people's health by harnessing data science at scale across the UK.

Each site's research organisations will receive long-term funding awards and will become part of a collaborative research community working together to deliver the priorities of Health Data Research UK. This initial funding has been awarded following a rigorous application process, which included interviews with an international panel of experts.

Professor Andrew Morris, Director of Health Data Research UK, commented: "I am delighted to make today's announcement, which marks the start of a unique opportunity for scientists, researchers and clinicians to use their collective expertise to transform the health of the population.

The six HDR UK sites, comprising 21 universities and research institutes, have tremendous individual strengths and will form a solid foundation for our long-term ambition. By working together and with NHS and industry partners to the highest ethical standards, our vision is to harness data science on a national scale. This will unleash the potential for data and technologies to drive breakthroughs in medical research, improving the way we are able to prevent, detect and diagnose diseases like cancer, heart disease and asthma.

I am grateful to our funders who recognise the importance of collaboration at scale, and the pivotal contribution of health data research to the UK's ambition to be a global leader in life sciences, for health and economic benefit."

Professor James McElnay, Acting Vice Chancellor and President, Queen's University Belfast said, "This is a tremendous achievement for our researchers here at Queen's. It is a recognition of the leadership that we have shown in the area of Big Data and Health Science and represents a superb opportunity to employ these skills to enhance human health.

Professor Chris Elliott, Pro Vice Chancellor of the Faculty of Medicine, Health and Life Sciences at Queen's said. "I am delighted that we have achieved this prestigious award, it aligns perfectly with the One Health Strategy of our Faculty and highlights our ability to lead and deliver high quality research with patient impact."

Health Data Research UK is committed to the highest ethical standards and will work with experts in public engagement to ensure the public voice is central to its activity. It will work at scale and forge national and international partnerships to deliver:

- New scientific discovery
- A vibrant training environment for the next generation of data scientists
- A trustworthy UK-wide research and innovation ecosystem for health data research.

Health Data Research UK is a joint investment co-ordinated by the Medical Research Council, working in partnership with the British Heart

















NHS National Institute for Health Research



Foundation, the Department of Health and Social Care (England), the Economic and Social Research Council, the Engineering and Physical Sciences Research Council, Health and Social Care Research and Development Division (Welsh Government), Health and Social Care Research and Development Division (Public Health Agency, Northern Ireland), Scottish Ministers acting through their Chief Scientist Office of the Scottish Government Health and Social Care Directorates, and Wellcome.

Commenting on the success, Professor Ian Young, Head of the Health and Social Care Research and Development Division (Public Health Agency, Northern Ireland) said: "I am delighted that Queen's University Belfast came through this rigorous competitive selection process and will help lead a transformative data science initiative across the UK. Northern Ireland has key skills in this area and translating outputs from this programme will have key benefits for patients and society in Northern Ireland."

The successful Health Data Research UK sites are:

- 1. Wales/Northern Ireland Swansea University, Queen's University Belfast
- 2. Cambridge Wellcome Sanger Institute, European Bioinformatics Institute, University of Cambridge
- London UCL, Imperial College London, King's College London, Queen Mary University of London, The London School of Hygiene & Tropical Medicine
- 4. Midlands University of Birmingham, University of Leicester, University of Nottingham, University of Warwick
- 5. Oxford University of Oxford
- 6. Scotland University of Edinburgh, University of Aberdeen, University of Dundee, University of Glasgow, University of St Andrews, University of Strathclyde

For further details, please visit the Health Data Research UK website.

# QUB GLIOMA RESEARCH TEAM FINANCIAL SUPPORT AND CHARITY VISIT

The QUB Brain Tumour Focus Group is supported by Brainwaves NI and the Robin Menary Foundation. On 31 January 2018, representatives from the charities visited the Centre for Cancer Research and Cell Biology (CCRCB) at Queen's University Belfast to learn more about research being undertaken by the Brain Tumour Focus Group and to take a tour of the CCRCB laboratories.

Gillian and Mike McDonald from Brainwaves NI were accompanied by Sharon McKeown who tragically lost her daughter Victoria, aged only 25, to glioblastoma in May 2016. Reah McKeown and baby daughter Victoria also joined the visit. The McKeown family have since raised over £13,000 to go towards brain tumour research.

Later that day, Nikki Boyd from the Robin Menary Foundation visited the CCRCB to gain an insight into the work being done here. Nikki's brother, Robin Menary was only 38 when he died of glioblastoma in August 2011, leaving behind his wife and young twins. The Robin Menary Foundation was set up in 2011 by Robin Menary's family to raise money for brain tumour research and are continuing to support work at CCRCB having previously supported Dr Tom Flannery in 2015.

The QUB Brain Tumour Focus group at the CCRCB is led by Professor Kevin Prise and Dr Darragh McArt. The group's research aims are to uncover the molecular mechanisms of brain tumour disease progression and recurrence. This information should assist with patient diagnosis and in future with oncological management, as well as the identification of potentially new targets for drug development or repurposing. Recent additions to the Brain Tumour Focus Group include Dr Caitríona McInerney a Research Fellow funded by Brainwaves NI and Miss Janey Spence a PhD student jointly funded by Brainwaves NI and the Robin Menary Foundation.



Professor Kevin Prise, Dr Darragh McArt, Dr Caitríona McInerney and Miss Janey Spence with Gillian and Mike McDonald (Brainwaves NI) and Sharon, Reah and baby Victoria McKeown



Professor Kevin Prise, Dr Darragh McArt, Miss Janey Spence and Ms Nikki Boyd (Robin Menary Foundation)

#### WIDENING PARTICIPATION UNIT JUNIOR ACADEMY

Following the success of previous events, CCRCB again hosted the Widening Participation Unit Junior Academy. On 8 February 2018, around 80 Year 10 pupils from schools around Northern Ireland attended the Life Sciences Taster Day at the Faculty of Medicine, Health and Life Sciences. During their visit to CCRCB, pupils took part in an interactive workshop. A short presentation, delivered by Dr Pamela Maxwell, informed pupils of key facts on cancer as a disease and how research has improved treatment options for patients. The pupils then had the opportunity to extract DNA from strawberries with the help of Dr Lisa Crawford, Dr Wendy Allen, Dr Folake Orafidiya, Mrs Maria Rea and Miss Judi Manley. Working as groups the students also made Jelly Baby DNA models to help them learn about the structure of DNA. The visit finished with a short quiz. Plenty of questions were asked during the interactive sessions and the event was enjoyed by the pupils, teachers and CCRCB staff who took part.

#### BACK TO THE FUTURE – REINVENTING PATHOLOGY

Hynes, S.O., Coleman, H.G., Kelly, P.J., Irwin, S., O'Neill, R.F., Gray, R.T., McGready, C., Dunne, P.D., McQuaid, S., James, J.A., Salto-Tellez, M., Loughrey, M.B. Back to the future: routine morphological assessment of the tumour microenvironment is prognostic in stage II/III colon cancer in a large population based study. *Histopathology*. 2017 Jul;71(1):12-26.

The paper cited above, led by Sean Hynes and Maurice Loughrey, won Histopathology's new Roddy MacSween Prize (Wiley Publishers). There is a perception among the wider pathology community that the photogenic nature of the scientific team (*see picture*) was as important for this prize as the published science.



Dr Helen Coleman, Dr Stephen McQuaid, Dr Maurice Loughrey, Dr Philip Dunne, Professor Manuel Salto-Tellez, Dr Jackie James and Dr Sean Hynes

### QUEEN'S PROFESSOR LAUNCHES PRECISION CANCER MEDICINE CALL TO ACTION IN THE EUROPEAN PARLIAMENT

Speaking in the European Parliament in Brussels, as part of a European Cancer Patient Coalition (ECPC) event hosted by Member of the European Parliament Marlene Mizzi (S&D, Malta), Professor Mark Lawler, Centre for Cancer Research and Cell Biology, Queen's University Belfast, launched a Call for Action for the widespread employment of cancer biomarkers to underpin a precision cancer medicine health strategy for European citizens. Cancer biomarkers are molecules that are produced by cancer cells and that can be detected in bodily fluids or tissues. They help identify people who have cancer or who are at risk of getting cancer and are also key to the use of personalised approach to treat cancer, based on an individual's specific genomic profile within his/her cancer cells.

Professor Lawler said "It is critical that we use biomarkers to enhance our ability to detect cancer at the earliest possible stage and to employ biomarkers to inform our clinical management of patients following treatment. Without access to clinically relevant biomarkers, it will not be possible for Europe to realise the promise of precision medicine and personalised healthcare, thus disadvantaging European cancer patients from receiving the best possible care for their disease. Biomarkers can detect cancer earlier, select best treatment options for patients and spare patients the debilitating side effects of treatments that will have no therapeutic benefit. If used appropriately, they can also lead to cost efficiencies and cost savings within health services across Europe."



Professor Mark Lawler (CCRCB) launches the European Alliance for Personalised Medicine (EAPM) Congress "Personalising Your Health: A Global Imperative!" at the Waterfront in Belfast

Professor Lawler highlighted how research at Queen's University Belfast is at the forefront of this precision medicine revolution and is driving a research-enabled comprehensive cancer care agenda, involving patients, academia, health care and industry which Professor Lawler highlighted as a model to be scaled up at European level. Queen's reputation in this exciting area of healthcare is also reflected in the decision of the European Alliance for Personalised Medicine, the premier European policy organisation to have its inaugural congress in Belfast. "Queen's is playing a central role in embedding precision medicine and personalised health into European health care systems and Professor Lawler's leadership emphasises Queen's international reputation in this critical part of 21st century healthcare, said Professor James McElnay, Acting Vice Chancellor and President of Queen's University Belfast. "Coming on the back of the recent highly successful European Alliance for Personalised Medicine Congress in Belfast, an official EU Presidency event, Professor Lawler's central role in this current initiative that he is launching in the European Parliament emphasises how we at Queens are driving the international Precision Medicine agenda."

#### STRATIFIED IN COLORECTAL CANCER CONSORTIUM (S:CORT) AT THEIR SPECIAL SYMPOSIUM WORKSHOP AT THE EAPM CONGRESS IN BELFAST

From left, Mr Mark Moss (Bowel Cancer UK/EuropaColon), Ms Margaret Grayson (NICRCF), Dr Sandra Irvine (Northern Ireland Cancer Research Consumer Forum (NICRCF), Ms Barbara Moss (Bowel Cancer UK/EuropaColon), Professor Tim Maughan (University of Oxford), Dr Claire Butler (University of Oxford), Dr Claire Butler (University of Oxford), Dr Claire Mark Lawler (CCRCB), Dr Susan Richman (University of Leeds), Dr Joshua Holdern (University of Oxford), Dr Ed Goodall (NICRCF), Dr Philip Dunne (CCRCB) at the EAPM Congress in Belfast.



# QUEEN'S RESEARCHERS WIN TOP AWARDS AT PRESTIGIOUS EUROPEAN CONGRESS



Professor Mark Lawler and Dr Philip Dunne, Centre for Cancer Research and Cell Biology, Queen's University Belfast with Denis Horgan, Executive Director, European Alliance for Personalised Medicine

Dr Philip Dunne, Senior Research Fellow at the Centre for Cancer Research and Cell Biology, Queen's University Belfast, was awarded the best scientific presentation at the European Alliance for Personalised Medicine Congress, which was held recently in Belfast. Dr Dunne's work was selected for the top prize from over 200 scientific abstracts that were presented at the Congress, which was an official EU Presidency event as part of the Estonian Presidency. On receiving the award, Dr Dunne said, "It is an absolute honour to accept this award for our work on developing specific biomarkers to aid clinical decision-making for patients with colorectal (bowel) cancer. Colorectal cancer represents the second most common cause of cancer related death in the UK and we urgently need to develop new ways to improve how we treat patients with this disease."

Describing the importance of his work Dr Dunne said, "There are approximately 1.4 million cases of colorectal cancer diagnosed annually worldwide, with 41,000 cases in the UK each year. Looking at the genes inside colorectal cells has greatly increased our knowledge of the disease, but as yet this increased understanding has yet to significantly contribute to standard patient care, particularly for patients with early stage disease. Our research, performed in collaboration with the University of Torino, Italy has identified a new gene signature which indicates that there are five different types of colorectal cancer and the technique that we have developed to reveal this new and exciting data is robust, allowing us to use biopsy samples from patients to inform clinical care." Altmetrics, a specific measure of the relevance and importance of health research

studies, has ranked the Belfast-led study in the top 2% worldwide for research impact.

Professor Mark Lawler, current Chair of Translational Cancer Genomics at Queens's and senior author of this study said, "We have demonstrated the ability of this new classification system to stratify patients based on their molecular subtype in a series of colorectal biopsy samples obtained during a phase II clinical trial. The ultimate aim of this work is to allow patients to receive a more tailored disease management plan based on the specific biology of their tumour. This will maximise the chances of treatment success but also minimise the debilitating toxicities that can occur with cancer therapies. Using our collaborative links to the UK and European clinical trial network, we now aim to further test these findings in ongoing prospective clinical trials with the aim of improving patient outcomes for this difficult-to-treat disease."

This work was funded by the Medical Research Council and Cancer Research UK and is part of the Stratified Medicine Consortium in Colorectal Cancer (S:CORT), a UK wide network employing precision medicine approaches to enhance outcomes in colorectal cancer. Dr Dunne is the current Entwistle Fellow at Queen's University Belfast, and has recently undertaken a visiting fellowship at the University of Turin to enable this collaborative work.

Emphasising the strength of the research at the Centre for Cancer Research and Cell Biology (CCRCB) at Queen's, researchers from CCRCB also won two of the five prizes on offer for best poster presentations at the EAPM Congress. Dr Matthew Alderdice, a Postdoctoral Researcher with Dr Dunne and Professor Lawler won a prize for his work, also in colorectal cancer, highlighting how a molecular pathology approach can unravel some of the distinct biology that is inherent to this common malignancy, while Dr Francesca Amoroso, who works with Dr Ian Mills at CCRCB won a prize for her research into prostate cancer. Commenting on these successes, Professor Chris Elliott, Pro Vice Chancellor of the Faculty of Medicine, Health and Life Sciences at Queen's said, "It is a remarkable achievement for Queen's researchers to win 50% of the prizes on offer at this prestigious international Congress and showcases the excellence and international standing of our research."



Dr Matthew Alderdice with his prize at the European Alliance for Personalised Medicine Congress in Belfast

### LEGAL PROFESSIONALS MEET RESEARCH PROFESSOR

A group of solicitors from five law firms in Belfast visited the Centre for Cancer Research and Cell Biology at Queen's in mid-March to learn more about the work underway and the role gifts in Wills play in funding research supported by Cancer Research UK.

All five law firms participate in the Cancer Research UK Free Will Service, which offers supporters aged 55 and over the opportunity to have their Wills written free of charge. Many individuals and couples make use of the service to settle their affairs and to leave gifts to the charity for the benefit of research in the future. With more than one third of research funding derived from legacies, Cancer Research works closely with local legal service providers to raise awareness of the importance of having an upto-date Will and a Will that adequately reflects the donor's wishes.

The group listened to a talk by Professor Daniel Longley whose work is focused on improving outcomes for patients diagnosed with bowel cancer. They also received an update on the operation of the Free Will Service and the value of gifts pledged to Cancer Research UK as a result of their work in this area.



Professor Daniel Longley presenting his research to a group of solicitors from five local law firms in Belfast

"Feedback from the event proved that bringing the law and science together can reap enormous benefit for professionals whose dayto-day lives pass in seemingly un-related fields," said Jon Collins, Legacy Partnership Manager for Cancer Research UK. "However, there is common ground when it comes to the desire to improve cancer outcomes and huge pride that such world-class research is taking place in Belfast."

# **ECMC NORTH NETWORKS IN NEWCASTLE**

The Experimental Cancer Medicine Centre (ECMC) Network is dedicated to supporting pioneering, early-stage clinical trials and translation of scientific discoveries into new cancer treatments for patients. Belfast ECMC is one of 18 adult centres across the UK. Funded by HSC R&D Division and Cancer Research UK, Belfast ECMC is a collaboration across the Centre for Cancer Research and Cell Biology, NI Biobank and NI Cancer Trials Network to drive the discovery, development and testing of new treatments to combat cancer. The network model aims to bring faster patient benefit and one initiative to facilitate this is 'ECMC North'. Scientists, doctors, nurses and patient representatives from six centres (Belfast, Leeds, Liverpool, Manchester, Newcastle, Sheffield) attended an 'ECMC North Showcase' in Newcastleupon-Tyne, 15 March 2018, chaired by Professor Ruth Plummer. The emphasis of the event was to showcase work from the ECMC North centres and promote collaborative approaches across the network. Professor Richard Wilson kicked-off presentations by senior investigators. He informed the filled auditorium about the phase I trial of 5-FU and CV6-168, currently in development. After the networking lunch early career researchers presented from each centre. From Belfast, Dr Eileen Parkes presented her research on the biology underpinning the DNA Damage Response Deficiency (DDRD) assay, developed by QUB and Almac Diagnostics,



and Dr Philip Dunne described how 'Intratumoural stromal heterogeneity undermines colorectal cancer transcriptional classification'. Belfast poster presentations were by Dr Suneil Jain who presented 'ASTX660 + Radiotherapy in Prostate Cancer' and Professor Daniel Longley, 'Pre-clinical development of first-inclass small molecule inhibitors targeting FLIP.' All attending found the event a very useful constructive and collaborative opportunity. Further events will take place across the network to build on this success.

# AWARDS AND PRIZES

**Dr Francesca Amoroso** was awarded the EAPM 2017 Poster Winner at this year's European Alliance for Personalised Medicine Congress in Belfast.

**Dr Claire Harrison's** article 'Ruxolitinib vs best available therapy for ET intolerant or resistant to hydroxycarbamide' has been selected as one of the top ten most outstanding manuscripts published in Blood in 2017.

Miss Gemma Gregg (PhD student) and Dr Matt Humphries (Postdoctoral Research Fellow) won two out of the five best poster prizes awarded at the Irish Association for Cancer Research (IACR) this year.



Miss Gemma Gregg



Dr Matt Humphries

Dr Caroline Forde, Clinical Fellow, was successful in her application for the NCI Cancer Prevention Programme this summer. http://www.research.hscni.net/trainingopportunities-national-cancer-institute-usa

Congratulations to **Dr Sarah Osman** who recently presented at the STFC Advanced Radiotherapy Network+ Sandpit on "Extracting meaning from big data in radiotherapy". She helped develop a project on the application of Machine Learning in Radiotherapy, in collaboration with groups in Manchester and Leicester which has received pump-priming funding to organise a series of workshops. The target of these workshops is to develop a network bringing together RT and STFC machine learning communities and to establish preliminary framework/standards for application of Medicine Learning in Radiotherapy and develop future proposals for learning from historical data to improve future patients' outcomes and quality of life.

**Dr James Beirne**, an Academic Clinical Lecturer, currently on the Clinical Academic Training Programme within the Centre for Cancer Research and Cell Biology has received the following awards in connection with his 12 month sabbatical to the Queensland Centre for Gynaecological Cancer, Brisbane, Australia:

- HCA International Foundation Travelling Fellowship 2017, "The development of an integrated ovarian cancer service for Northern Ireland", (£8,000).
- The Dowager Countess Eleanor Peel Trust Travelling Fellowship 2017, "The development of an integrated ovarian cancer service for Northern Ireland", (£20,000).
- Florence and William Blair Bell Research Fellowship 2017, Royal College of Obstetricians and Gynaecologists, (£5,000).

Ms Meadhbh Hogg, a final year medical student at Queen's has won the 2017 Undergraduate Edinburgh EAR Congress Essay Prize. The Royal College of Radiologists hosts this national prize, which is open to UK medical students. To enter this prize, students are asked to submit an essay on a topic relevant to clinical oncology or describing personal experience of working in a department of clinical oncology during an elective period or vacation. Meadhbh based her essay on the topic of The Role of Post-Operative Brachytherapy in accelerated partial breast irradiation. Meadhbh is keen to consider a career in oncology and has been successful in being appointed to an Academic FY2 training post in Northern Ireland.



Ms Meadhbh Hogg (Year 5 Medical Student) and Dr Gerry Hanna (Year 4 Cancer Studies Module Coordinator)

Dr Anita Lavery and Dr Gerard Walls have both been successful in obtaining prestigious Wellcome Health Research Board Irish Clinical Academic Training fellowships. They are the first from CCRCB to be successful in obtaining this funding. The Wellcome – Health Research Board Irish Clinical Academic Training (ICAT) Programme is a unique all Ireland cross-institutional, comprehensive national programme for Clinician Scientists based at six major Irish universities and their affiliated hospital groups. The ICAT fellowship is an integrated programme spanning 6-7 years of seamless, supported and mentored academic and clinical training targeting future academic leaders. Pictured with their clinical supervisors (Dr Suneil Jain and Dr Gerry Hanna), both Dr Lavery and Dr Walls will formally commence their fellowships in August 2018. Dr Lavery's fellowship will be on improving outcomes for patients with prostate cancer and Dr Wall's research will focus on improving outcomes for patients with lung cancer who are treated with Radiotherapy.



Dr Suneil Jain, Dr Gerard Walls, Dr Anita Lavery and Dr Gerry Hanna

Dr Jonathan McAleese, Dr Claire Rooney and Dr Gerry Hanna had their work recognised at a national UK lung cancer meeting in Dublin in January 2018. At the British Thoracic Oncology Group (BTOG) meeting, attended by over 800 delegates, their paper on outcomes following the treatment of lung cancer with radiotherapy was awarded the runner up prize for the best new research presented. In the work presented, their audit of practice across the UK showed that survival outcomes following curative-intent radiotherapy were comparable with the best-performing European nations. In spite of this, survival for patients with lung cancer still remains poor and ongoing research within CCRCB and the Northern Ireland Cancer Centre hopes to make further progress in improving outcomes for patients with lung cancer, which is the leading cause of cancer related death.



Dr Jonathan McAleese, Dr Claire Rooney and Dr Gerry Hanna

# DONATIONS

#### **RUDOLPH AND FROSTY**





Accompanied by Rudolf and Frosty the Snowman and supporting the Centre for Cancer Research and Cell Biology at Queen's University are: (L-R) Kathy Moore, Principal of Ballynahinch High School, Wilfred Keys and Arthur Gibson, with Alice O'Rawe, Development Manager, Health at Queen's University. The staff at the Ballynahinch school raised over £500 for cancer research in the run-up to Christmas by selling the Rudolph and Frosty characters made by Wilfred (who lives in Spa outside Ballynahinch), and his family and friends.

Supporting the work of the Centre for Cancer Research and Cell Biology at Queen's University Belfast is Adrian Bingham (left) from Newcastle, pictured with Alice O'Rawe, Development Manager, Health at Queen's. Adrian and his customers in Newcastle have raised over £3,000 by selling wooden Rudolph and Frosty characters in the run-up to Christmas in 2016 & 2017.

#### **TITANIC CHARITY BALL ORGANISERS**



It's all smiles as Titanic Charity Ball organisers hand over almost £38,000 for cancer research at Queen's.

Pictured at the cheque presentation in December are Ms Louise Topping, Mr Stuart McIntosh (Centre for Cancer Research and Cell Biology), Ms Lynette McHendry, Dr Niamh Buckley (School of Pharmacy), Ms Alice O'Rawe (Development Manager for Health in the Development and Alumni Relations Office) and Ms Julie Scates.

Louise, Lynette and Julie organised the highly successful fundraising event in October 2017 to raise funds to support the latest breast and ovarian cancer research carried out at Queen's University Belfast.

#### CANCER RESEARCH UK ANNUAL SOONER BALL

In November 2017, The CR-UK Legenderry Fundraising Committee held their annual Sooner Ball and special guest for the evening was Professor Mark Lawler, Chair in Translational Cancer Genomics, Queen's University Belfast. In his address, Professor Lawler spoke of how small countries can do big things, highlighting the role that Queen's University Belfast played as architects of the European Cancer Patient Bill of Rights, which was launched at the European parliament in Strasbourg on World Cancer Day in 2014. He spoke on the recent breakthroughs in bowel cancer research from Queen's which gained significant national and international media and scientific attention. Professor Lawler also took the opportunity to pay tribute to former Vice Chancellor and President of Queen's University Belfast, Professor Patrick (Paddy) Johnston, a native of Derry, who so tragically passed away earlier this year. He spoke of Paddy's vision for the highest quality cancer research at Queen's to achieve the best outcomes for cancer patients, locally, nationally and globally and vowed to the audience that Queen's would deliver on Paddy's vision.



# **RECENT GRANTS AWARDED**

Investigator(s)	Sponsor	Title	Amount	Start Date	End Date
Butterworth, Karl Prise, Kevin	National Centre for the Replacement Refinement & Reduction of Animals in Research	Refinement of soft tissue targeting and alignment protocols in small animal radiotherapy using an injectable fiducial marker (PhD Studentship)	£90,000	01/10/18	30/09/21
Crawford, Lisa Mills, Ken	Leukaemia & Lymphoma NI	The role of HUWE1 in DNA replication and genome stability in Multiple Myeloma (PhD Studentship)	£102,443	24/09/18	23/09/21
McIntosh, Stuart	Royal College of Surgeons of England	Surgical Speciality Lead (Breast Surgery)	£36,000	01/11/17	31/10/20
O'Sullivan, Joe Prise, Kevin Cole, Aidan	QUB Foundation	Clinical Research Fellowship in Radiotherapy	£250,000	01/08/18	31/07/21
Prise, Kevin	Royal Embassy of Saudi Arabia	Ali Hamad Dafer Al Shehri (Bench Fees)	£12,000	10/11/17	09/11/18
Prise, Kevin	Biochemical Society	Summer Studentship	£1,600	25/06/18	19/08/18
Scott, Chris Burden, Roberta Buckley, Niamh	Breast Cancer Now (PhD Studentship)	Characterisation of the protease CTSS as a novel therapeutic target in TNBC	£98,844	24/09/18	23/09/21
Scott, Chris Longley, Dan	Biotechnology & Biological Sciences Research Council	Development of intracellular VNAPs as novel tools to dissect intracellular biological processes	£346,537	01/04/18	31/03/21
Waugh, David Gonzalez de Castro, David James, Jackie Kennedy, Richard Salto-Tellez, Manuel	Invest NI	Precision Medicine Centre of Excellence	£5,834,664	01/05/17	11/11/23

### **MEASURES OF ESTEEM**



Professor Hiroshi Amano, 2014 Nobel Laureate in Physics, Dr Hisanori Fukunaga, Mr Shoji Mizuno, President of Marubun Research Promotion Foundation at the Marubun Research Promotion Foundation Award Ceremony in Tokyo on 7 March 2018

Congratulations to **Dr Hisanori Fukunaga** who has recently received two awards. The first of these was a research grant from the Japanese Radiation Effects Association. The second was a prestigious International Exchange and Research Grant from the Marubun Research Promotion Foundation in Japan. He was presented with his award in Japan on the 7th March by Professor Hiroshi Amano, 2014 Nobel Laureate in Physics. Dr Fukunaga is currently a PhD student at CCRCB supervised by Professor Kevin Prise and Dr Karl Butterworth working on 'Low-dose radiationinduced risk and bystander signaling in spermatogonial stem cells'.



Dr Eileen Parkes

**Dr Eileen Parkes** presented at ASCO-SITC 2018 in San Francisco in January, entitled "Exploration of the cGAS-STING pathway in prostate cancer". The work was performed as a collaboration between Almac Diagnostics and the Stratified Medicine Group in CCRCB.

**Dr Philip Dunne** has been appointed as a senior panel member of the prestigious National Cancer Research Institute (NCRI) Colorectal Clinical Studies Group (CSG). The NCRI CSGs were formed over ten years ago with UK wide strategic remit to develop and maintain a comprehensive national portfolio of clinical trials and studies in health services research. Dr Dunne's appointment to the CSG will be for three years in the first instance. The CSGs are the primary, but not sole, route through which clinical trials are developed and considered. Dr Dunne has been invited to the panel to add scientific expertise in the areas of molecular pathology of the disease, to aid development of clinically-relevant biomarkers for early stage colorectal cancer and to foster translational research in the trial portfolio that enhances the potential for stratified medicine.

# **RECENT PUBLICATIONS**

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### **NEW APPOINTMENT PROFILE**



Dr Lisa Crawford was appointed as a lecturer in Blood Cancers in January 2018 and this lectureship post is supported by Leukaemia & Lymphoma NI (LLNI).

Dr Crawford's research is focused predominantly on investigating the role of the ubiquitin proteasome system in the pathogenesis of Multiple Myeloma and identifying biomarkers and opportunity for therapeutic intervention within this system. Dr Crawford conducted both her doctoral and postdoctoral research within the Blood Cancer Research Group at Queen's.

Her early research focused on investigating the specificity of proteasome inhibitors in Multiple Myeloma as they were emerging in the clinic and on identifying the potential of targeting the proteasome in Chronic Myeloid Leukaemia. In more recent years, Dr Crawford's research has progressed to a wider investigation of the UPS to identify biological and molecular targets that are central to disease biology and may offer novel therapeutic targets. Dr Crawford obtained a Haematology Association of Ireland/Royal College of Pathologists Fellowship award, along with pilot funding from the British Society for Haematology to identify key components of the ubiquitin proteasome system that contribute the pathogenesis of Multiple Myeloma and subsequently secured additional funding from Bloodwise and Leukaemia & Lymphoma NI to develop this area.

# **EVENTS** INAUGURAL LECTURE

**Speaker:** Professor Daniel Longley, QUB **Title:** "Life and Cell Death"

Tuesday 19 June 2018 at 4pm, North Lecture Theatre, MBC.

#### **NEW APPOINTMENTS**

Welcome to the following staff recently appointed to the Centre:

#### Research Staff:

Dr Dimitra Kalamida Mr Christopher McGivern Dr Keara Redmond Mrs Julia Revolta Mr Peter Smyth

#### Technical Staff:

Mr Adam Harris

#### Administrative Staff:

Mr Patrick Carson Ms Joanne McCrossan

#### Visiting Researchers:

Ms Julie Alcocer Miss Gabrielle Feydel Mr Ruben Grosso Dr Claudio Isella Miss Astrid Bouchet Mathion Dr Javier Ignacio Quezada-Marin

#### MEMORIAL SYMPOSIUM FOR PROFESSOR PATRICK JOHNSTON



A Leader and Innovator in Cancer Research and Treatment

A Symposium to mark the contribution of the late Professor Patrick Johnston will be held on 16 May 2018 at Riddel Hall.

#### **Registration link:**

https://www.qub.ac.uk/schools/mdbs/Research/ MemorialResearchSymposiumforProfessorPatrickJohnston/



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