QUEEN'S UNIVERSITY BELFAST | THE PATRICK G JOHNSTON CENTRE FOR CANCER RESEARCH

Bulletin

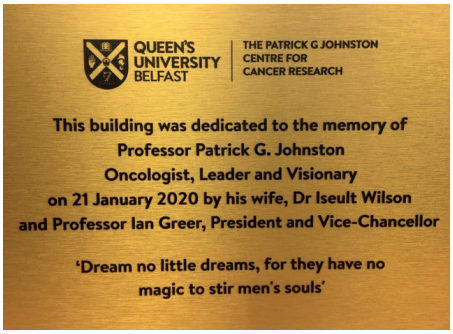
January 2020 Issue 45

CENTRE RENAMED AS THE PATRICK G JOHNSTON CENTRE FOR CANCER RESEARCH

Pictured above are Professor Chris Scott (Acting Centre Director), Dr Iseult Wilson and Professor Ian Greer

We are delighted to announce that the Centre was renamed as the Patrick G Johnston Centre for Cancer Research on Tuesday 21st January 2020. The rededication ceremony was carried out by his wife, Dr Iseult Wilson and the Vice Chancellor Professor Ian Greer following speeches by Professor Greer, Professor Chris Scott (Acting Centre Director) and Professor James Johnston. The event was attended by the Johnston family circle and friends as well as many guests who had worked with Paddy Johnston over the years. A video made to mark the event highlighted reflections from Professor Roy Spence, Professor Paul Harkin, Professor Bert Rima, Mrs Catherine McKeown, Ms Kirsty McLaughlin and Professor Scott on their memories of Paddy including entertaining anecdotes about the first time they met him. Their comments highlighted Paddy's drive, enthusiasm, vision and commitment to cancer research, as well as his desire to create a comprehensive cancer service to improve treatments and the lives of cancer patients.

The words on the plaque unveiled on the evening are very appropriate and the plaque now resides in the foyer beneath a portrait of Paddy.



CENTRE RENAMED AS THE PATRICK G JOHNSTON CENTRE FOR CANCER RESEARCH

Dr Iseult Wilson unveiling the plaque under Paddy's portrait, accompanied by the Vice Chancellor, Professor Ian Greer

Pictured outside the newly named Centre are Paddy's four sons (l-r): Niall, Eoghan, Seamus and Ruairi with their mother

Pictured above are Paddy's siblings (l-r): Niall, James, Eleanor, Brian, Fionnuala and Michael

REPORT LED BY QUEEN'S PROFESSOR FINDS SERIOUS EAST-WEST DIVIDE IN CANCER CONTROL AND CARE IN EUROPE

A new survey conducted by the Central and Eastern European Cancer Action Group (CEECAG) has found severe shortcomings in managing cancer incidence and control in Central and Eastern Europe (CEE), whose "young brains" are increasingly moving to the west.

According to the World Health Organisation (WHO), about one in six deaths is due to cancer worldwide, and the disease is the second leading cause of death globally. WHO data shows that cancer was responsible for an estimated 9.6 million deaths in 2018.

A new survey conducted by CEECAG suggests that cancer cases are expected to almost double by 2035. In the case of Europe, the report says the bloc has 1/8 of the world's population but at the same time ¼ of global cancer deaths. In its report, CEECAG pointed out a number of challenges that the countries of Central and Eastern Europe are faced with compared to Western Europe.

Lead author of the report, Professor Mark Lawler from the Centre for Cancer Research and Cell Biology at Queen's University Belfast, said there are "cancer inequalities" in Europe as well as differences in relation to outcomes. The gaps range from the existence or implementation of National Cancer Control Plans (NCCP) to cancer registries and research.

For example, according to Prof Lawler, 90% of Europe's west has a NCCP compared to only 54% in Central and Eastern Europe. "That's really important because you need to have some sort of a framework that allows you to look and see what your current situation is in relation to cancer incidence and mortality. You need to use that data or cancer intelligence to both construct and implement a National Cancer Control Plan," he said.

"Cancer intelligence is an incredibly important part of how we can plan going forward. So in a number of CEE countries, we don't have data on how many cancers there are in that particular country, what the mortality is, what the survival rates are and then other significant factors," he added.

For the full interview with Prof Lawler, please go to: https://www.euractiv.com/section/diabetes-cancer-hepatitis/news/report-finds-serious-east-west-divide-in-cancer-handling-in-europe/

CANCER RESEARCHERS GET IN GEAR FOR CANCER RESEARCH UK'S CYCLE 300

Queen's University scientists urged the public to get into gear in September and raise funds for Cancer Research UK as they clock up 300 miles by bike.

Cancer researchers Ciaran Fairmichael, Aoife McCooey, Richard Turkington, Paul Mullan and Gaurang Patel urged men and women to sign up to Cancer Research UK's Cycle 300 – and choose how, when and where to clock up 300 miles on a bike in September to raise funds for life-saving research.

Cancer Research UK funds life-saving research carried out by Dr Turkington and his colleagues at the Centre for Cancer Research and Cell Biology at Queen's University.

Dr Turkington carries out research into oesophageal and stomach cancer. Northern Ireland has one of the highest rates of oesophageal cancer in the world and symptoms include difficulty swallowing

and heartburn for more than three weeks. Catching the disease early is especially important and Dr Turkington's research focuses on new ways to diagnose and treat oesophageal cancer.

Dr Turkington, who often cycles the 20-mile return journey from his home to work at Queen's, is keen to show pedal power can make a crucial difference to people diagnosed with the disease.

Andrea Kennedy, Cancer Research UK's spokesperson in Northern Ireland, said: "We are very grateful to Dr Turkington and colleagues for their support and hope it will start a chain reaction, sparking the interest of cyclists of all ages and abilities.

QUEEN'S PLAYING A LEADING ROLE IN NEW HEALTH DATA RESEARCH HUB THAT CAN HELP SAVE THE LIVES OF 30,000 NHS CANCER PATIENTS ACROSS THE UK

New collaboration hails historic opportunity to allow UK health data to transform cancer patient outcomes and clinical research effectiveness.

A new collaboration has been selected to deliver DATA-CAN, the National Health Data Research Hub for Cancer, which will transform the accessibility of high-quality cancer data across the UK. The collaboration has been set up to protect patient privacy and will improve clinical outcomes for the 500,000 people every year in the UK who are diagnosed with cancer. Improving outcomes will directly impact half of the UK population who will face a cancer diagnosis at some point in their lifetime and could save up to 30,000 lives.

DATA-CAN is supported by patients, clinicians, academia as well as life sciences researchers and innovators, and will include cancer centres across the UK. The collaboration will help empower the NHS to benefit from existing data to improve care for cancer patients, while supporting universities and companies who work with DATA-CAN to discover and develop new diagnostics and treatments.

DATA-CAN will deliver benefits to the NHS, its patients and healthcare professionals, improve the UK's cancer health outcomes, enhance innovation and attract new global investment into UK life sciences. HDR UK's Health Data Research Hub programme is part of the Government's Life Sciences Industrial Strategy to make the UK a global leader in health data science.

DATA-CAN will have three areas of primary focus:

1. Enable and expand UK-wide cancer datasets
2. Provide high-quality real-world data to support health and care transformation
3. Use real-world data to support clinical trial design and delivery

The principal founding partners of DATA-CAN, involving a collaboration of NHS bodies, research organisations, patient advocacy groups and industry include:

- UCL Partners, representing One London
- Queen's University, Belfast, representing Northern Ireland and Wales
- University of Leeds and Leeds Teaching Hospitals, representing the North of England
- Genomics England
- Cancer Research UK, MacMillan Cancer Support, Cancer 52 representing cancer charities and patient advocacy groups
- IQVIA, representing industry

DATA-CAN is supported by the following organisations:

The Christie NHS Foundation Trust; The Royal Marsden Hospital; Royal Brompton and Harefield NHS Foundation Trust; Guy's and St Thomas' NHS Foundation Trust; NHS England (London); One London LHCRE; Yorkshire and Humber LHCRE; Y&H AHSN; HDR-Scotland; HDR-London; HDR-NI & Wales; MedCity; HIRANI; Medicines Discovery Catapult; Swansea University; Children's Cancer and Leukaemia Group (a cancer charity); ACT for Cancer; Bowel Cancer UK; Data Saves Lives; European Alliance for Personalised Medicine; University of Edinburgh; University of Glasgow; University of Exeter; Alan Turing Institute

Data security will be central to the collaboration's operations and patients will be centrally involved in decisions about how their information might be used. Data will be made available for appropriate use by approved researchers and innovators, and the collaboration will support them by providing expert advice from specialists who understand cancer and health data.

DATA-CAN Hub Director, Charlie Davie said:

"This collaboration will transform how cancer clinical data is used to improve patient care.

"Working across all four nations of the United Kingdom, DATA-CAN is a unique partnership of NHS organisations, patients, academia and industry working together to improve cancer care by harnessing anonymous clinical and genomics data to provide cancer patients with an earlier diagnosis, faster access to clinical trials, and access to innovative new medicines specifically tailored to an individual's genomic profile."

DATA-CAN Scientific Director, Prof Mark Lawler said:

"DATA-CAN has been designed "with the patient, around the patient and for the patient" and represents a significant opportunity to improve patients' lives. We are incredibly excited about this unique partnership of patients, healthcare professionals, scientists and industry from all four nations of the United Kingdom. Our research shows that if we get this right, we can help save nearly 30,000 lives across the UK. This National Health Data Research Hub for Cancer allows us to compete, not against each other, but against our common enemy... cancer. Data is a precious gift from patients and citizens and if we use it responsibly and effectively, it will be the gift that keeps on giving. We are delighted to have won the support of HDR-UK in our bid and will now commence the vital work of delivering improved cancer outcomes across the UK.

Margaret Grayson, Chair, Northern Ireland Consumer Forum for Cancer said:

"This is a very exciting opportunity to use data responsibly and effectively, with patients at its heart, in order to deliver real innovation for citizens and society. Data has the potential to save lives and improve quality of life. We look forward to working with DATA-CAN to make this vision a reality."

Tim Sheppard, Senior Vice President and General Manager, Northern Europe, IQVIA added:

"This is an unprecedented opportunity to combine information on cancer and its treatment, with genomic data from across the UK. It will provide opportunities for world-leading research into new treatments, and a data-enabled approach to preventing, diagnosing and treating cancer.

"Connecting these datasets through the IQVIA Oncology Data Network will enable rapid identification of patients suitable for a cancer trial and frontline cancer care quality analytics, including real-time insights on how treatments are performing in the real-world. IQVIA believes the UK has the potential to become the global leader in health data science and this announcement confirms our commitment to the UK's vibrant life science sector."

https://uclpartners.com/what-we-do/data-can-health-data-research-hub-cancer/

QUEEN'S UNIVERSITY SELECTED TO ADDRESS DATA SCIENCE SKILLS SHORTAGE IN THE UK

Queen's University Belfast has been selected as one of six UK Universities to develop a health data science Master's programme to address the significant skills shortage in data science that currently exists in the UK.

Funded through Health Data Research UK, the UK's health data science institute, the new programme will involve collaboration between Queen's University Belfast and Swansea University, together with partners in industry and health and social care.

Professor Mark Lawler, Associate Pro-Vice-Chancellor and Professor of Digital Health, Faculty of Medicine, Health and Life Sciences at Queen's and Overall Lead on the programme commented: "This is an incredibly exciting opportunity to develop the digital scientists of the future.

"Data is now at the heart of 21st century research and innovation – but we need to grow the talent so that we can lead this digital revolution."

Queen's was selected following an open competition that involved universities across the UK. President and Vice-Chancellor of Queen's University Belfast, Professor Ian Greer said: "Big data has the potential to transform local services and address key health and industry issues in Northern Ireland and further afield.

"This Master's programme aligns with our 'One Health Strategy' at Queen's and highlights our ability to be leaders in date science to deliver high quality research and teaching with real patient impact."

Queen's is partnering with Swansea University in this initiative, bringing together complementary skills that will deliver a premier training experience that harnesses the talent of our young people and provides them with significant opportunities, in research, in healthcare and in industry.

Professor Stuart Elborn, Pro-Vice-Chancellor for the Faculty of Medicine, Health and Life Sciences at Queen's University Belfast, said: "This exciting programme is a first step in equipping teams to use health data analysis to improve outcomes for patients. The programme is in line with the recent Topol report which highlighted the need to upskill healthcare teams and allow patients to appreciate the outstanding opportunity data science provides."

Professor Sinead Brophy, Professor of Data Science at Swansea University said: "We are very excited to work in partnership with Queen's to offer students our joint breadth of knowledge, skills, and research programmes and to build real expertise for our future Health Data Scientists."

Queen's will be funded to deliver a three-year student intake between 2020 and 2023. Professor Peter Diggle, Director of Training at Health Data Research UK, said: "We are delighted to support these six universities to develop these vital programmes, which will bring us one step closer to building a community to lead the health data science revolution."

The six universities selected to lead the master's programmes are:

HDRUK
Health Data Research UK

- Queen's University Belfast (in collaboration with Swansea University)
- University of Cambridge
- The London School of Hygiene and Tropical Medicine
- University of Bristol
- University of Exeter
- University of Leeds

Each of the successful institutions demonstrated scientific excellence, a track record in postgraduate training, innovative approaches to further education and strong institutional commitment.

QUEEN'S UNIVERSITY BELFAST SUCCESSFUL IN INNOVATIVE NEW WELLCOME TRUST DOCTORAL TRAINING PROGRAMME IN HEALTH DATA SCIENCE

Queen's University Belfast, as part of a Health Data Research UK - Alan Turing Institute partnership, has been selected to host a new Doctoral Training Programme in Health Data Science funded by the Wellcome Trust.

This award builds on the partnership between Health Data Research UK (HDRUK) and the Alan Turing Institute (Turing) and will ensure that the next generation of health data scientists are trained and supported by experts in the health data domain.

The four-year programme will have a UK-wide reach. With HDRUK and Turing leading the application, other partners include NHS Digital, Eisai, Astra-Zeneca, Intel, GSK, the Institution of Engineering and Technology, IQVIA, Microsoft and seven leading universities: Queen's University Belfast; University of Birmingham; University of Cambridge; University of Edinburgh; University College London; University of Manchester and University of Oxford.

The new programme will support scientific excellence while also committing to improving research culture across the UK. It aims to promote positive research environments and to actively address issues like student mental health good research practice, supervision and mentorship relationships, career transitions and increasing diversity in research. HDRUK and Turing are looking forward to being part of this drive towards creating a new research culture and training the health data scientists of the future.

Professor Peter Diggle, Director of Training at HDRUK, said: "This PhD programme is a big step forward in our ambition to meet the UK's need for trained health data scientists at every career stage, from school leavers to senior leaders. Working with The Alan Turing Institute, and with our academic and industry partners throughout the UK, we aim to attract the UK's best statistics and computer science graduates into the data-rich world of twenty-first century health research."

Dr Chris Yao, Turing Fellow and co-director of the programme, said: "This is an unprecedented opportunity to develop our future digital health leaders. Ensuring that our PhD students are part of an extensive cross-sector, multi-disciplinary collaborative network involving Health Data Research UK, The Alan Turing Institute and many other partner organisations will enable them to address significant challenges in implementing health data science at scale. "

Prof Mark Lawler, QUB Lead of the programme, said: "This is a highly innovative programme that will embed Queen's students within a culture of excellence and transformation, providing the opportunity to apply the latest methodologies and approaches to underpin new discoveries that will advance human health and wellbeing. I am very excited to be part of an initiative that will promote a new more nuanced student-focussed research culture and provide the combination of data science expertise, leadership skills and desire to innovate that will enable our cadre of students to be competitive and successful in a rapidly evolving domain."

CANCER FOCUS NORTHERN IRELAND INVESTING £300,000 INTO RESEARCH

Upper Gastrointestinal Research Team: Cancer Focus NI will be supporting Dr Richard Turkington, Dr Anita Lavery and Dr Leanne Stevenson.

The UK and Ireland have the highest rates of oesophageal adenocarcinoma in the world and the number of cases in men has risen by 50% in the last 25 years. The rates of pancreatic cancer are also increasing with it expected to become the second leading cause of cancer-related death by 2030, overtaking breast and colon cancer. Faced with these rapidly emerging cancers, it was announced on World Cancer Day that Cancer Focus Northern Ireland were investing £300,000 into research on oesophageal and pancreatic cancer at Queen's University Belfast.

Recently, the advent of immunotherapy has transformed the outlook for previously recalcitrant cancers, such as lung cancer and malignant melanoma. It is hoped that similar progress can be made for oesophageal and pancreatic cancer as Dr Richard Turkington, Senior Clinical Lecturer, explains: "This pioneering new project aims to determine how immunotherapy can successfully treat pancreatic and oesophageal cancers, two cancers which at present are hard to treat and have very low survival rates. Unfortunately, when we look at oesophageal and pancreatic cancer combined, they are the second highest cause of lives lost to cancer in Northern Ireland and are responsible for twice as many lives lost in a year as prostate cancer.

"There's been little improvement in the last 40 years in terms of survival rates for oesophageal and pancreatic cancer. We hear a lot about other cancers, but not so much about these cancers, so we need to raise awareness and try to carry out more research."

Dr Turkington's research group has previously identified a subset of oesophageal cancers which contain large amounts of DNA damage and inflammation and are primed to respond to immunotherapy. A similar subtype exists in pancreatic cancer. However, the vast majority of patients with either cancer do not show any activation of the immune system and there is a pressing need to turn these tumours from being 'immunologically cold' to 'hot' so that they will respond to immunotherapy.

Roisin Foster, Chief Executive of Cancer Focus NI, says immunotherapy has really changed things for other cancer patients and offers the potential to be effective against pancreatic and oesophageal cancers.

"This pioneering research offers hope for patients in an area where there has been little real progress for years," she says. "We're funding Dr Turkington's research with legacy money that has come in over the last few years and we're asking people if they would think about remembering Cancer Focus in their will or making a donation now, and we guarantee that any money raised will be used in Northern Ireland."

The research project will continue over three years at the Patrick G Johnston Centre for Cancer Research and will support the work of Dr Leanne Stevenson and Dr Anita Lavery.

RESEARCHERS DISCOVER A NEW WAY TO IMPROVE THE ASSESSMENT OF PROSTATE CANCER AGGRESSIVENESS

Researchers from Queen's University Belfast have discovered a new way to predict the aggressiveness and future behaviour of prostate cancers.

The new method uses images from computed tomography (CT) scans that are routinely collected from all patients. The images are then analysed by a computer to extract hundreds of features, termed 'radiomic features', which have the potential to uncover disease characteristics that fail to be seen by the naked eye.

This technique could complement traditional assessment methods and may help clinicians to make more informed personalised treatment decisions for men with prostate cancer. In the long run, it may reduce or even replace the need for traditional invasive biopsies.

The research has been published in the International Journal of Radiation Oncology, Biology, and Physics and was carried out in collaboration with the Northern Ireland Cancer Centre and Maastricht University.

Prostate cancer is one of the most common forms of cancer, but the behaviour of an individual cancer is extremely variable. While some tumours metastasize rapidly, others can remain harmlessly localised in the prostate gland for years.

Dr Suneil Jain, Principal Investigator from the Centre for Cancer Research & Cell Biology at Queen's University Belfast, said: "To predict the risk represented by a given tumour, 'Gleason scores' are typically assigned based on how a sample of the tumour appears under the microscope compared with normal prostate tissue. Patients are then classified as low, medium, or high risk depending on their Gleason score, level of prostate specific antigen (PSA) in the blood, and on size of the tumour and whether it has spread to other parts of the body."

The research team used CT scans for 342 prostate-cancer patients acquired as a routine care prior to radiotherapy treatment. Focussing on the prostate gland, the researchers then extracted and analysed over 500 radiomic features from each image. These features, along with the Gleason score and risk group classification for each patient, were used to 'train' a computer to be able to discriminate between patients in low- and high-risk groups, and between those with low and high Gleason score.

CT-based classification models proved able to discriminate between patients from different Gleason score and risk groups. The system was especially competent at distinguishing between patients in low- and high-risk groups, and between those with low and high Gleason score.

Dr Sarah Osman, Lead Investigator and Postdoctoral Research Fellow at Queen's University Belfast and the Belfast Health and Social Care Trust, explained: "This is the first CT-based radiomics investigation for this treatment site and it is showing very promising results. Although the present study will not revolutionize prostate cancer treatment by itself, it shows what could be possible in the future. We are building on collaborations with other institutes to provide datasets to validate our exciting findings and take this discovery forward."

Professor Philippe Lambin from the Maastricht University and one of the co-inventors of Radiomics added: "Typically, there isn't a huge amount of quantitative data in radiology reports. With the radiomics revolution, we need to look at medical images not just as pictures, but as quantitative data potentially useful for trials and routine care."

Professor Ian Young, Chief Scientific Advisor to the Department of Health in Northern Ireland and Director of HSC R&D said: "Cancer is a major cause of morbidity and mortality. By supporting research like this, we can ensure that patients have access to the most innovative cancer treatments, and the best preventive strategies can be put in place."

Dr Matthew Hobbs, Deputy Director of Research at Prostate Cancer UK said: "We're delighted to see more results coming out of the Prostate Cancer UK and Movember funded Centre of Excellence.

"This new work suggests that we may be able to use a CT scan to assess how aggressive a cancer will be. The next step will be to compare this to other imaging techniques, and to assess how well it performs when biopsies are informed by multiparametric MRI scans, which is now standard practice. It will also be important to understand how well this technique predicts outcomes in the longer term for men with localised disease."

The research was supported by the Belfast-Manchester Movember Centre of Excellence, Prostate Cancer UK, and the Health and Social Care Research and Development Division of the Public Health Agency.

CT-BASED RADIOMICS REVEALS PROSTATE CANCER RISK

Features extracted from routinely acquired CT images can be used to classify risk among prostate-cancer patients. Using a machine-learning method, researchers in the UK and Netherlands trained prediction models to identify textural and intensity-based features imperceptible to human observers, and to associate them with commonly used measures of disease progression. The technique could complement conventionally used methods and in the long-run could lead to a non-invasive alternative to tissue biopsies for guiding treatment decisions (Int. J. Radiat. Oncol. Biol. Phys. 10.1016/j.ijrobp.2019.06.2504).

Prostate cancer is one of the most common forms of cancer, but the post-diagnosis development of the disease is extremely variable. While some tumours metastasize rapidly, others can remain inert for years. To predict the risk represented by a given tumour, oncologists typically assign a Gleason score (GS) based on how a sample of the tumour appears compared with normal prostate tissue.

The problem, says Sarah Osman of Queen's University Belfast (QUB) and Northern Ireland Cancer Centre (NICC), is that "prostate cancer is highly heterogeneous in nature and a limited number of biopsies may not give the full picture." As a complementary method to current biopsy methodologies, Osman – with collaborators at QUB, NICC and D-lab at Maastricht University Medical Centre – has turned to the growing discipline of "radiomics".

"Radiomics is the high-throughput extraction of quantitative imaging features with the intent of creating mineable databases from routine medical scans," explains Osman. "The central hypothesis is that mining of such imaging features will reveal predictive or prognostic associations between images and medical outcomes – i.e., radiomics features can act as surrogates of biological characteristics."

Although the principle is rooted in image-classification techniques that are decades old, advances in computer hardware and software have prompted an explosion in the field over the last few years. Approaches based on MR images have already shown promise, but as imaging protocols vary between clinics, and MRI scans only recently became part of routine practice for cancer management, it has been difficult to obtain the large data sets needed to test the technique thoroughly.

Instead, Osman and colleagues used X-ray CT scans acquired for 342 prostate-cancer patients prior to radiotherapy. Because such images are already a routine part of radiotherapy treatment planning, they are widely available and highly standardized. At the time of treatment, each patient had been assigned a GS according to the results of between six and 21 biopsies, and had been classified as low, medium or high risk depending upon the size of the tumour and whether the cancer had spread.

Focusing only on the prostate itself, the researchers extracted 1618 candidate radiomic features from each image. These were based on the statistics and distribution of voxel intensity, and measured different aspects of texture heterogeneity. Of this total, 522 features passed reliability tests and were taken forward for analysis. These features, along with the GS and risk classification for each patient, were used as training data for a machine-learning algorithm.

Image analysis technique may reduce unnecessary breast biopsies

After training, the classification models proved able to discriminate between patients in low- and high-risk groups, and between those with low and high GS. The system was especially competent at distinguishing between separate patients with the same high GS, but whose biopsies showed subtle morphological differences. This distinction, which is based on the prevalence within the prostate of the most abnormal-looking tissue, has been shown previously to indicate likely disease outcome.

Although the present study will not revolutionize prostate cancer treatment by itself, Osman says, as the first CT-based radiomics investigation for this treatment site, it shows what could be possible in the future. "The idea is that the information gained by radiomics analysis will complement what we get from biopsies, helping us determine risk groups more accurately, and subsequently leading to more personalized treatment decisions."

LIMAVADY COUPLE JULIE AND GRAHAM LOUGHERY RAISE OVER £60,000 FOR QUEEN'S CENTRE FOR CANCER RESEARCH AND CELL BIOLOGY (CCRCB)

In June 2019 Julie and Graham Loughery, with the help and support of their family and friends, held a fundraising charity BBQ, auction and stock judging night on their farm. This event, along with numerous donations, raised £60,200 to support breast cancer research at the Centre for Cancer Research and Cell Biology (CCRCB) at Queen's University Belfast.

Donations were received from friends, family and the farming community – especially farmers at the Ballymena Livestock Market where Graham works as an auctioneer. Generous support was also shown from different societies with which Graham and Julie have connections.

In May 2018 Julie found a small lump. The doctor 'red flagged' her and Julie was seen at the breast clinic within a fortnight where she was diagnosed with breast cancer. Aged 43, Julie was 7 years away from her first NHS mammogram. Now, following chemotherapy and a mastectomy she is 'loving life again'. Julie is hoping her story will raise awareness of the importance of self-checking for both men and woman, and ultimately, save lives.

Julie said: "Thanks to the staff and surgeons at Altnagelvin Area Hospital I am feeling fit, healthy and able to live life as I did before. The kindness, care and attentiveness I have received has been second to none.

"The fun and hard work organising the BBQ has been so fulfilling. And to know that I am helping others battling this disease by supporting research into new treatments – which will hopefully do away with surgery and chemo in the future – is most rewarding.

"My surgeon, Mr Padraig Diggin, recommended the Queen's Foundation, and in particular the breast cancer research that is carried out at the Centre for Cancer Research and Cell Biology at Queen's, with 100% of the money raised going directly into research in Northern Ireland."

Julie continued: "I had hoped the BBQ would raise a substantial amount, and in return everyone would have a great night out. We have been absolutely blown away by the generosity towards our efforts to raise money for CCRCB.

"Without the help and support of friends and family it would not have been possible. I had a team of helpers who worked tirelessly alongside me for the months running up to the BBQ, making our sheep shed ready, selling tickets, collecting auction prizes and much more.

"On the night, friends and family cooked for a crowd of 700! All the food was donated by butchers and producers from near and far. Auctioneer William Blackburn conducted the auction which saw 80 lots go under the hammer, such as hotel vouchers, shepherds crooks, football/rugby shirts and weekends away to name but a few.

(L-R): Julie Loughery pictured during her visit to CCRCB with Teresa Sloan (Head of Health Fundraising at Queen's), Dr Kienan Savage (CCRCB), Graham Loughery, Mr Stuart McIntosh and Mr Padraig Diggin.

"The auction raised a staggering £28,000. People came from all over the country, England and Scotland too. There was something for everyone – food, dancing, music and even a bouncy castle and rodeo sheep for the kids!"

Julie was speaking while on a visit to CCRCB with her husband and consultant surgeon. There she met researchers, enjoyed a tour of the labs and found out first-hand about the important work carried out at Queen's. She plans to share with all those who supported her efforts not only what she learned, but also what a huge difference their donations were making. Mr Stuart McIntosh, Consultant Breast Surgeon and Clinical Researcher at CCRCB said: "It is down to gifts from donors like Julie and Graham that we are able to carry out ground-breaking research at Queen's. The money raised will be used to support a three year PhD student who will carry out breast cancer research. I would like to express my personal thanks to everyone who supported them in raising this significant amount."

Housing over 300 international researchers, CCRCB brings together scientists, doctors and nurses who, by sharing knowledge and expertise, are developing lab-based discoveries into treatments that will benefit patients in Northern Ireland and beyond. The Centre, on the University's Lisburn Road campus, was officially opened in November 2007 by Senator George Mitchell, then Queen's Chancellor.

"Thanks to research, more than 85% of women live beyond five years after their diagnosis, with new tests developed to help decide which therapies will work for which patient, therefore helping to personalise breast cancer treatment. Supporters like Julie can help us develop new treatments faster and change the lives of women with breast cancer and their families."

The Queen's University of Belfast Foundation is the registered charity of the University. Since its establishment in 1999, the Foundation has engaged with graduates and friends of the University to change lives by funding medical research and by supporting students to realise their full potential through scholarships and prizes.

Thanking Julie and Graham Loughery, the Head of Health Fundraising in the Development and Alumni Relations Office at Queen's, Teresa Sloan, said: "On behalf of CCRCB and the Queen's University Foundation, can I say just how delighted and grateful we are for the wonderful generosity of the Loughery family, their friends and the members of their local community. Staff at CCRCB are working tirelessly to understand the biology of cancer, to improve treatments and to train the next generation of clinicians and scientists. The £60,200 will support a three year PhD student who will carry out breast cancer research at the University. Ultimately, this research will improve outcomes and the quality of life for patients here in Northern Ireland and further afield."

To support health-related research at Queen's visit the Development and Alumni Relations Office website https://www.qub.ac.uk/alumni/QueensUniversityofBelfastFoundation/ or contact Teresa Sloan, Head of Health Fundraising, (t.sloan@qub.ac.uk), telephone +44 (0)28 9097 5394. Medical queries arising out of this news story should be raised directly with a GP/consultant and not with DARO staff.

ACADEMIC SUCCESS









Will McDaid, Sophia Halliday, Kyle Thompson, Hisanori Fukunaga, Laura Feeney, Shannon Beattie, Michael Johnston and Charles Haughey (pictured above) receiving a pen from Prof Chris Scott on behalf of CCRCB to congratulate them on successfully achieving their PhD.

Christine Greene (pictured above) receiving a pen from Prof Chris Scott on behalf of CCRCB to congratulate her on successfully achieving her MPhil.

CHARLES HAUGHEY IS OUR PGR STUDENT OF THE YEAR

Double congratulations were in order for Charles Haughey on 13 January as he was awarded the CCRCB Postgraduate Research Student of the Year Award.

This award highlights the exceptional contribution Charles has made to our Centre during his time as a PhD student. In particular, the prize highlights those who go the extra mile in contributing to the life of the Centre and the wider University, to public engagement and in the provision of support for their lab group, peers and staff within the Centre.

Charles helped to fundraise through numerous activities such as the "Movember Spinathon" and volunteered at multiple CR-UK events including "Pretty Muddy" and "Race for Life". During his PhD, he helped to raise awareness about the Centre by meeting with MLAs and cancer survivors in Stormont to discuss our research and participated in a high school outreach program which involved teaching children in various schools about our ongoing research. Charles played an active role in organising and taking part in lab tours for private funders and during our Centre's Open Days. He was the PGR Lead Student Representative and helped voice student concerns and recommended areas for improvement as well as organising APR information workshops and various social events for his fellow students.

Charles is pictured receiving his trophy from Prof Chris Scott and Dr Lisa Crawford (Associate Deputy Director of Postgraduate Research).

POSTDOC AWARD

At the Postdoc showcase event in September, Xanthi Stachtea (pictured right) was awarded the postdoc citizenship prize. In her absence, Leanne Stevenson was awarded the postdoc prize for exceptional support.

DONATION FROM HORTICULTURE FORUM NI

A cheque for £500 was presented by Horticulture Forum NI to the Centre for Cancer Research and Cell Biology. Pictured (L-R) Lucile Gilpen, Professor Chris Scott (CCRCB), John Shannon, Hamilton Loney, Adrian McGowan and Barbara Erwin

LEUKAEMIA & LYMPHOMA NI AWARD £20,000 GRANT TO DR FIONA FURLONG AND DR JAINE BLAYNEY

Dr Furlong and Dr Blayney have been awarded a grant of £20,000 from Leukaemia & Lymphoma NI which they will use to investigate long non-coding RNA (lncRNAs), and its function in diseases such as cancer, specifically Acute Myeloid Leukaemia. This research will enable the team to explore the mechanisms underlying AML differentiation as a new treatment strategy for AML.

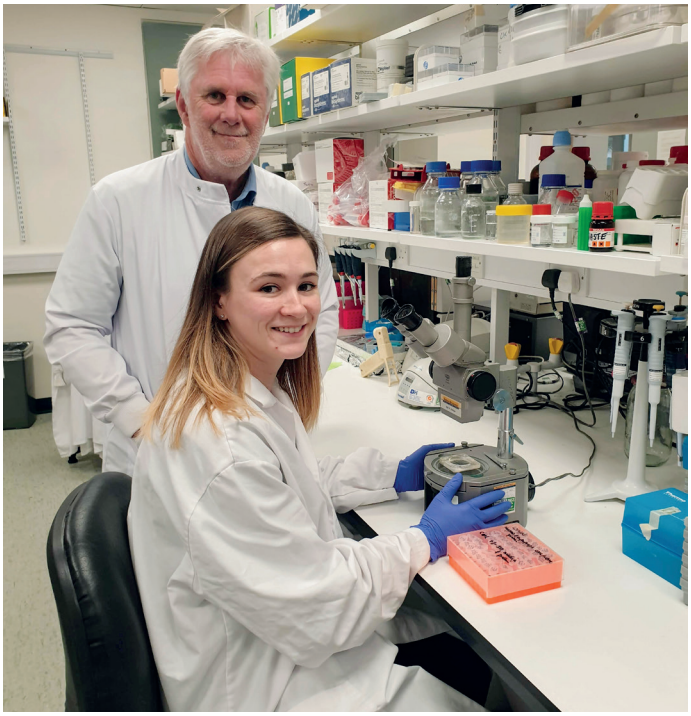
LEUKAEMIA & LYMPHOMA NI CELEBRATE 55 YEARS OF RESEARCH

Leukaemia & Lymphoma NI celebrated 55 years of research in Belfast at their Love Letters Ball in the Titanic Hotel on 27th September. The charity was established by the McDowell family in 1964 following the loss of their daughter, Carole, and the organisation has always had very strong links to Queen's University. Throughout the last 55 years the charity and its dedicated supporters have raised over £13 million to fund laboratory research, clinical support and education.

LEUKAEMIA & LYMPHOMA NI AWARD £50,000 GRANT TO PROF DAVID GONZALEZ DE CASTRO

Prof Gonzalez De Castro has been awarded a grant of £50,000 from Leukaemia & Lymphoma NI which will be used to explore the validation of a comprehensive clinical genomic tool for the diagnosis of lymphoproliferative malignancies.

The aim of the project is to validate a novel genomics approach in a cohort of acute lymphoblastic leukaemias, mature lymphoproliferative disorders and multiple myeloma from Belfast as well as the collaborating centres in Newcastle and Salisbury. The validation data will support the implementation of next generation sequencing routinely in the diagnosis of all haematology patients across Northern Ireland in the Belfast Health & Social Care Trust laboratories.



LEUKAEMIA & LYMPHOMA NI LAUNCH MYELOID BLOOD CANCER INITIATIVE

Despite advances in treating other cancers, the standard of care for patients with myeloid malignancies has not changed for decades.

It's not for lack of effort, but myeloid malignancies such as AML, MDS and MPN are complex groups of different subtypes of blood cancer with the survival prognosis often being very poor.

The Myeloid Blood Cancer Initiative will use advanced genomic technology to understand the genetic mutations in myeloid malignancies at diagnosis and during disease; we can then identify targeted therapies to inhibit these mutations and more effectively treat the cancer.

It's hoped that the results of the initiative will improve patient diagnosis, advance research capability and improve therapeutic options for patients with myeloid blood cancers. There is also potential for this to be rolled out to other blood cancer types.

Dr Kathryn Clarke will be working alongside Professor Ken Mills on delivering this project.

HELEN'S BAY LADIES SUPPORT OVARIAN CANCER RESEARCH

The Past Lady Captain of Helen's Bay Golf Club, Linda Wilson, handed over a wonderful £6,076 to Dr Nuala McCabe and Dr Eileen Parkes to support ovarian cancer research. During her year as Lady Captain, Linda staged a Bridge Drive, a Charity Luncheon and an Afternoon Tea which were generously supported by hundreds of lady members and their guests.

UFU SUPPORTS CCRCB AT THE BALMORAL SHOW

We were delighted that the Ulster Farmers' Union raised funds and awareness for CCRCB at their popular stand at the Balmoral Show this year. Every year UFU nominates a President's charity, and so far they have hosted dinners, local talks and events – raising almost £6,000 for cancer research. Ivor Ferguson, UFU President, shared, "Cancer is an awful disease that I'm sure has touched every UFU member's family. We are proud to be raising funds to help CCRCB's battle against cancer."

CORRECTION

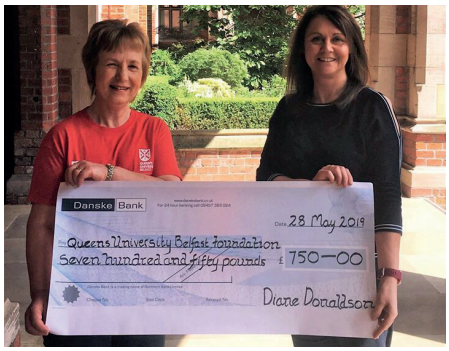
In the July 2019 CCRCB Bulletin we reported that the Castlerock Charity Crafters also donated £1,000 to Margaret Oliver's cause. They in fact donated £2,000!

HOLSTEIN NI RAISES £22,500 FOR CANCER

Holstein NI's 4th annual open day has raised £22,500 for charity, bringing the total over the last four years to a staggering £90,500. The money from the 4th annual open day has been divided equally between three nominated beneficiaries – CCRCB; Friends of the Cancer Centre; and Cancer Fund for Children. Teresa Sloan praised the success of the fun-filled event, which was generously hosted by the Mitchell family from Banbridge and their team of volunteers.

WALKING FOR BRAIN CANCER RESEARCH

For the second year running Amy Elliott and her family walked from Portballintrae to the Causeway in memory of her father. This year, despite the weather, she proudly raised over £790 for brain cancer research in Northern Ireland.



HAPPY RETIREMENT DIANE!

To mark her retirement from Danske Bank this year, Diane Donaldson asked for a charity donation instead of a gift. Her friends and family hosted a retirement gathering and she raised a wonderful £750 for breast cancer research at CCRCB.

SISTERS HOST CHARITABLE VINTAGE FASHION SHOW

At the recent World Cancer Research Day, Bridget Owens and her sister Marian Keenan surprised us with another donation of £500 to cancer research. Together they run an exciting venture called 'Living Vintage', a fashion show that donates all profits to local charities.

THANK YOU TO INTO

Staff members of the Irish National Teachers' Organisation, INTO, in St Colmcille's High School Crossgar hosted a charity pub quiz night, with £400 raised in total. This was generously split for the second year running between BRCA research and Mourne Mountain Rescue Team.

MASONIC LODGES SUPPORTING CANCER

Noel Drain marked his retirement as Provincial Grand Master of fifty Masonic Lodges in Londonderry and Donegal by raising an incredible £29,000 for cancer. He spent the summer personally presenting the donations to cancer charities and hospices across the island to highlight that the Masonic Lodges are a part of the community, not apart from it. We were delighted to receive £1,000 towards brain cancer research, inspired by Margaret Oliver.

RECENT GRANTS AWARDED

Investigator(s)	Sponsor	Title	Amount
Lawler, Mark; Gavin, Anna; Salto-Tellez, Manuel; James, Jacqueline; McArt, Darragh	Health Data Research UK	DATA-CAN: The Health Data Research Hub for Cancer	£4.6m
Lawler, Mark; Kee, Frank	Health Data Research UK	Interdisciplinary MSc in Health Data Science	£300,000
Lawler, Mark	Wellcome Trust	Health Data Research UK – Alan Turing Institute Doctoral Training Programme in Health Data Science	£6m
Hounsell, Alan; Prise, Kevin	Friends of the Cancer Centre	Radiotherapy Physics research fellow position	£157,894
Prise, Kevin; Hounsell, Alan; Jain, Suneil; McGarry, Conor;Grattan, Mark	EU Horizon 2020 – Research and Innovation Framework Programme (H2020-ICT-2019-2)	Optical Fibre Dose Imaging for Adaptive Brachytherapy	€4,819,920 (€688,342 to QUB)
Turkington, Richard; Savage, Kienan, Blayney, Jaine	Cancer Focus NI	Exploiting the Immune Landscape of Oesophageal and Pancreatic Cancer	£269,295
Branco, Cristina; Stitt, Alan; Medina, Reinhold	British Heart Foundation		
Jain, Suneil; McArt, Darragh; Cole, Aidan; Mills, Ian; O'Sullivan, Joe; McDade, Simon; LaBonte Wilson, Melissa; Prise, Kevin; Parkes, Eileen	Prostate Cancer UK		
Overton, Ian	LifeArc		
Van Schaeybroeck, Sandra	EC-Framework Projects (Framework 7)		
Small, Donna; Fitzgerald, Denise; Ingram, Rebecca; Longley, Dan; Kerr, Emma; Buckley, Niamh; Guzman de la Fuente, Alerie	Wellcome Trust		
Prise, Kevin; McArt, Darragh	Brainwaves NI	Genomic interrogation of primary and recurrent GBM	£57,393
Prise, Kevin; Butterworth, Karl	Brainwaves NI	Evaluating metal nanoparticle radiosensitisers with DNA repair inhibitors: a novel theranostic approach in primary glioblastoma	£45,954
Prise, Kevin; McArt, Darragh	University of Glasgow	PARADIGM data analytics for information discovery	£69,985

RECENT PUBLICATIONS

ALLOTT EH, SHAN Y, CHEN M, SUN X, KIRK EL, OLSHAN AF, GERADTS J, EARP HS, CAREY LA, PEROU CM, PFEIFFER PM, ANDERSON WF, TROESTER MA. 'Bimodal age distribution at diagnosis in breast cancer persists across molecular and genomic classifications' *Breast Cancer Res Treat* (epub ahead of print)

ALLOTT EH, CSIZMADI I, HOWARD LE, MULLER RL, MOREIRA DM, ANDRIOLE G, ROEHRBORN C, FREEDLAND SJ. 'Statin use and longitudinal changes in prostate volume; results from the REDUCE trial' *BJU Int* (epub ahead of print)

BENEFIELD H, ZABOR E, SHAN Y, ALLOTT EH, BEGG C, TROESTER MA. 'Evidence for etiologic subtypes of breast cancer in the Carolina Breast Cancer Study' *Cancer Epidemiol Biomarkers Prev* (epub ahead of print)

BORNSCHEIN J, WERNISCH L, SECRIER M, MIREMADI A, PERNER J, MACRAE S, O'DONOVAN M, NEWTON R, MENON S, BOWER L, ELDRIDGE MD, DEVONSHIRE G, CHEAH C, TURKINGTON R, HARDWICK RH, SELGRAD M, VENERITO M, MALFERTHEINER P; OCCAMS CONSORTIUM, FITZGERALD RC. Transcriptomic profiling reveals three molecular phenotypes of adenocarcinoma at the gastroesophageal junction. *International Journal of Cancer* (IF 7.36). 2019 May 3. doi: 10.1002/ijc.32384.

BRAADLAND PR, RAMBERG H, GRYTLI HH, URBANUCCI A, NIELSEN HK, GULDVIK IJ, ENGEDAL A, KETOLA K, WANG W, SVINDLAND A, MILLS IG, BJARTELL A, TASKEN KA: The beta2-Adrenergic Receptor Is a Molecular Switch for Neuroendocrine Transdifferentiation of Prostate Cancer Cells. *Mol Cancer Res* 2019.

BROWN SR, HALL A, BUCKLEY HL, FLANAGAN L, GONZALEZ DE CASTRO D, FARNELL K, MOSS L, GREGORY R, NEWBOLD K, DU Y, FLUX G, WADSLEY J. Investigating the potential clinical benefit of Selumetinib in resensitising advanced iodine refractory differentiated thyroid cancer to radioiodine therapy (SEL-I-METRY): protocol for a multicentre UK single arm phase II trial. *BMC Cancer*. 2019 Jun 14; 19(1):582

BRÜGGEMANN M, KOTROVÁ M, KNECHT H, BARTRAM J, BOUDJOGRHA M, BYSTRY V, FAZIO G, FROŇKOVÁ E, GIRAUD M, GRIONI A, HANCOCK J, HERRMANN D, JIMÉNEZ C, KREJCI A, MOPPETT J, REIGL T, SALSON M, SCHEIJEN B, SCHWARZ M, SONGIA S, SVATON M, VAN DONGEN JJM, VILLARESE P, WAKEMAN S, WRIGHT G, CAZZANIGA G, DAVI F, GARCÍA-SANZ R, GONZALEZ D, GROENEN PJTA, HUMMEL M, MACINTYRE EA, STAMATOPOULOS K, POTT C, TRKA J, DARZENTAS N, LANGERAK AW; EuroClonality-NGS working group. Standardized next-generation sequencing of immunoglobulin and T-cell receptor gene recombinations for MRD marker identification in acute lymphoblastic leukaemia; a EuroClonality-NGS validation study. *Leukemia*. 2019 Sep; 33(9):2241-2253

CATHERWOOD MA, GONZALEZ D, DONALDSON D, CLIFFORD R, MILLS K,

THORNTON P. Relevance of TP53 for CLL diagnostics. *J Clin Pathol*. 2019 May; 72(5):343-346

DAMBAL S, HOWARD LE, ALLOTT EH, ARONSON WJ, KANE CJ, AMLING CL, COOPERBERG MR, TERRIS MK, FREEDLAND SJ. 'Serum lipids prior to starting androgen deprivation therapy and risk of castration-resistant prostate cancer and metastasis: Results from the SEARCH Database' *J Urol* (epub ahead of print)

DUTTON LR, HOARE OP, MCCORRY AMB, REDMOND KL, ADAM NE, CANAMARA S, BINGHAM V, MULLAN PB, LAWLER M, DUNNE PD, BRAZIL DP. Fibroblast-derived Gremlin1 localises to epithelial cells at the base of the intestinal crypt. *Oncotarget*. 2019; 10:4630-4639

FUKUNAGA, H, YOKOYA, A., TAKI, Y., BUTTERWORTH, K.T., and PRISE, K.M., (2019), Precision radiotherapy and radiation risk assessment: how do we overcome radiogenomic diversity? *Tohoku Journal of Experimental Medicine*, 247, 223-235.

FUKUNAGA, H., and PRISE, K.M., (2018), Non-uniform radiation-induced biological responses at the tissue level involved in the health risk of environmental radiation: a radiobiological hypothesis. *Environmental Health*, 17(1):93

FUKUNAGA, H., TAKI, Y., and PRISE, K.M., Diversity of ATM gene variants: a population-based genome data analysis for precision medicine (2019), *Human Genomics*, 13, 38.

FUKUNAGA, H., PRISE, K.M., and TAKI, Y., (2019). An updated understanding of the WRN variants using the Japanese whole-genome reference panel 3.5KJPNv2. *Geriatrics & Gerontology International*, 19, 961-962.

FUKUNAGA, H., KAMINAGA, K. SATO, T., BUTTERWORTH, K.T., WATANABE, R., USAMI, N., OGAWA, T., YOKOYA, A., and PRISE, K.M., (2019), High-precision microbeam radiotherapy reveals testes tissue-sparing effects for male fertility preservation. *Scientific Reports*, 9, 12618.

GRAHAM D, PRUE G, BAKER P, NUTTING C, GREENHOUSE P, LAWLER M. Early detection of HPV-associated oropharangeal cancer. *Lancet*. 2019; 393:2123-2124.

GULLIFORD, S.A and PRISE, K.M., (2019), RBE/LET in proton therapy: A primer. *Clinical Oncology* doi: 10.1016/j.clon.2019.06.009

HANTON, F., CHAUDHARY, P., DORIA, D., GWYNNE, D., MAIORINO, C, SCULLION, C., AHMED, H., MARSHAL, T., NAUGHTON, K., ROGMNANI, L., KAR, S., SCHETTINO, G., McKENNA, P., BOTCHWAY, S., SYMES, D., PATTHIL, R., PRISE, K.M., and BORGHESI, M., (2019), DNA DSB repair dynamics following irradiation with a laser-driven proton source at ultra high dose-rates. *Scientific Reports*, 9, 4471.

HENDERSON R, FRENCH D, SULLIVAN R, MAUGHAN T, CLARKE M, LAWLER M. Molecular biomarkers and precision medicine in colorectal cancer: a systematic review of health economic analyses. *Oncotarget*. 2019; 10:3408-3423

HOUNSELL AR, HAWKINS M AND EVANS PM 2019 Editorial: The challenge facing academic radiotherapy physics in the UK – *Clinical Oncology* https://doi.org/10.1016/j.clon.2019.07.005

ITKONEN HM, POULOSE N, WALKER S, MILLS IG: CDK9 Inhibition Induces a Metabolic Switch that Renders Prostate Cancer Cells Dependent on Fatty Acid Oxidation. *Neoplasia* (United States) 2019, 21:713-720.

KNECHT H, REIGL T, KOTROVÁ M, APPELT F, STEWART P, BYSTRY V, KREJCI A, GRIONI A, PAL K, STRANSKA K, PLEVOVA K, RIJNTJES J, SONGIA S, SVATOŇ M, FROŇKOVÁ E, BARTRAM J, SCHEIJEN B, HERRMANN D, GARCÍA-SANZ R, HANCOCK J, MOPPETT J, VAN DONGEN JJM, CAZZANIGA G, DAVI F, GROENEN PJTA, HUMMEL M, MACINTYRE EA, STAMATOPOULOS K, TRKA J, LANGERAK AW, GONZALEZ D, POTT C, BRÜGGEMANN M, DARZENTAS N; EUROCLONALITY-NGS WORKING GROUP. Quality control and quantification in IG/TR next-generation sequencing marker identification: protocols and bioinformatic functionalities by EuroClonality-NGS. *Leukemia*. 2019 Sep; 33(9):2254-2265

LAPPIN TR, LEE FS. Update on mutations in the HIF: EPO pathway and their role in erythrocytosis.

Blood Reviews. 2019 Sep; 37:100590. doi: 10.1016/j.blre.2019.100590. Epub 2019 Jul 16. Review. PMID: 3135009

LUX, F., TRAN, V.-L., THOMAS, E., DUFORT, S., ROSSETTI, F., MARTINI, M., TRUILLET, C., DOUSSINEAU, T., BORT, G., DENAT, F., BOSCHETTI, F., ANGELOVSKI, G., DETAPPE, A., CRÉMILLIEUX, Y., MIGNET, N., DOAN, B.-T., LARRAT, B., MERIAUX, S., BARBIER, E., ROUX, S., FRIES, P., MULLER, A., ABADJIAN, M.C., ANDERSON, C., CANET-SOULAS, E., BOUZIOTIS, P., BARBERI- HEYOB, M., FROCHOT, C., VERRY, C., BALOSSO, J., EVANS, M., JANIER, M., BUTTERWORTH, K.T., MCMAHON, S.J., PRISE, K.M., ARDAIL, D., RODRIGUEZ-LAFRASSE, C., LACOMBE, S., BERBECO, R., ALLOUCH, A., PERFETTINI, J.-L., CHARGARI, C., DEUTSCH, E., LE DUC, G., TILLEMENT, O., (2019), AGuIX® from bench to bedside - Transfer of an ultrasmall theranostic gadolinium-based nanoparticle to clinical medicine, *British Journal of Radiology*, 92, 1093, 20180365 (IF 1.814 76/128 Radiology, Nuclear Medicine & Medical Imaging).

LUXTON HJ, SIMPSON BS, MILLS IG, BRINDLE NR, AHMED Z, STAVRINIDES V, HEAVEY S, STAMM S, WHITAKER HC: The oncogene metadherin interacts with the known splicing proteins YTHDC1, Sam68 and T-STAR and Plays a novel role in alternative mRNA splicing. *Cancers* 2019, 11.

MARTIN, S.G., PRISE, K.M., and HILL, M.A., (2019), Editorial: Pushing the frontiers of radiobiology: A special feature in memory of Sir Oliver Scott and Professor Jack Fowler. *British Journal of Radiology*, 92, 1093, 20189005.

MATSUYA, Y., MCMAHON, S.J., GHITA, M., YOSHII, Y., SATO, T., DATE, H., and PRISE, K.M., (2019), Intensity Modulated Radiation Fields Induce Protective Effects and Reduce Importance of Dose-Rate Effects. *Scientific Reports*, 9, 9483.

MCCOMB J, MILLS IG, MULLER M, BERNTSEN HF, ZIMMER KE, ROPSTAD E, VERHAEGEN S, CONNOLLY L: Human blood-based exposure levels of persistent organic pollutant (POP) mixtures antagonise androgen receptor transactivation and translocation. *Environment International* 2019, 132.

MCCOMB J, MILLS IG, BERNTSEN HF, ROPSTAD E, VERHAEGEN S, CONNOLLY L: Human-Based Exposure Levels of Perfluoroalkyl Acids May Induce Harmful Effects to Health by Disrupting Major Components Androgen Receptor Signalling In Vitro. *Exposure and Health* 2019.

MOREIRA, H.M.R, LIBERAL, F.D.C., O'SULLIVAN, J.M., McMAHON, S.J., and PRISE, K.M., (2019), Mechanistic modelling of radium-223 treatment of bone metastasis. *International Journal of Radiation Oncology, Biology & Physics*, 103, 1221-1230. Highlighted in Physics World https://physicsworld.com/a/tumour-growth-models-shed-light-on-radionuclide-therapy/

NEWPOWER, M., PATEL, D., BRONK, L., GUAN, F., CHAUDHARY, P., McMAHON, S.J., PRISE, K.M., SCHETTINO, G., GROSSHANS, D.R., and MOHAN, R., (2019), Using the proton energy spectrum and microdosimetry to predict proton relative biological effectiveness. *International Journal of Radiation Oncology, Biology & Physics*, 104, 316-324.

OSMAN SO, LEIJENAAR RT, COLE AJ, LYONS CA, HOUNSELL AR, PRISE KM, O'SULLIVAN JM, LAMBIN P, MCGARRY CK, JAIN S, 2019 CT-based Radiomics for Risk Stratification in Prostate Cancer, *Int J Radiation Oncol Biol Phys*, https://doi.org/10.1016/j.ijrobp.2019.06.2504

RICHARDSEN E, ANDERSEN S, AL-SAAD S, RAKAEE M, NORDBY Y, PEDERSEN MI, NESS N, INGEBRIKTSEN LM, FASSINA A, TASKÉN KA, MILLS IG, DONNEM T, BREMNES RM, BUSUND LT: Low Expression of miR-424-3p is Highly Correlated with Clinical Failure in Prostate Cancer. *Scientific Reports* 2019, 9.

RICKETTS, K., AHMAD, R., BEATON, L., COUSINS, B., CRITCHLEY, K., DAVIS, M., DELFINO-MACHIN, M., EVANS, S., FENUYI, I., GAVRIILIDIS, A., HARMER, Q., JAYNE, D., JEFFORD, M., LOIZIDOU, M., MACROBERT, A., MOORCROFT, S., NAASANI, I., ONG, Z., PRISE, K.M., RANNARD, S., RICHARDS, T., SCHETTINO, G., SHARMA, R., TILLEMENT, O., WAKEFIELD, G., WILLIAMS, N., YAGHINI, E., and ROYLE, G, (2018), Towards translation of nanoparticle-enhanced radiotherapy. *British Journal of Radiology* 91(1092):20180325 doi: 10.1259/bjr.20180325.

RODDY, A.C., JUREK, A., SOUZA, J., GILMORE, A., O'REILLY, P.G, STUPNIKOV, A., GONZALEZ DECASTRO, D., PRISE, K.M., SALTO-TELLEZ, M., MCART, D.G., (2019), NUQA: Estimating cancer spatial and temporal heterogeneity and evolution through alignment-free methods. *Molecular Biology and Evolution* doi: 10.1093/molbev/msz182

SALVUCCI M, RAHMAN A, RESLER AJ, UDUPI GM, MCNAMARA DA, KAY EW, LAURENT-PUIG P, LONGLEY DB, JOHNSTON PG, LAWLER M, WILSON R, SALTO-TELLEZ M, VAN SCHAEYBROECK S, RAFFERTY M, GALLAGHER WM, REHM M, PREHN JHM. A Machine Learning Platform to Optimize the Translation of Personalized Network Models to the Clinic. *JCO Clin Cancer Inform*. 2019;3:1-17

SCLAFANI F, HULKKI WILSON S, CUNNINGHAM D, GONZALEZ DE CASTRO D, KALAITZAKI E, BEGUM R, WOTHERSPOON A, CAPDEVILA J, GLIMELIUS B, ROSELLÓ S, THOMAS J, TAIT D, BROWN G, OATES J, CHAU I. Analysis of KRAS, NRAS, BRAF, PIK3CA and TP53 mutations in a large prospective series of locally advanced rectal cancer patients. *Int J Cancer*. 2019 Jun 14. doi: 10.1002/ijc.32507. [Epub ahead of print]

SELBY P, POPESCU R, LAWLER M, BUTCHER H, COSTA A. The Value and Future Developments of Multidisciplinary Team Cancer Care. *Am Soc Clin Oncol Educ Book*. 2019 ;39:332-340

SIMUNOVIC M, EVERGREN E, CALLAN-JONES A, BASSEREAU P. Curving cells inside and out: roles of BAR proteins in membranee shaping and its cellular implications. *Annu Rev Cell Dev Biol 2019*. doi: 10.1146/annurev-cellbio-100617-060558 https://www.ncbi.nlm.nih.gov/pubmed/31340125

VERHAEGEN, F., VAZ, P., and PRISE, K.M., (2019), Small Animal IGRT Special Feature: Editorial: Small animal image-guided radiotherapy. *British Journal of Radiology*, 92, 1095

WEI L, OSMAN S, HATT M, EL NAQA I. Machine learning for radiomics-based multi-modality and multi-parametric modeling. *Q J Nucl Med Mol Imaging*. 2019 Sep 13. doi: 10.23736/S1824-4785.19.03213-8. [Epub ahead of print]

CELEBRATING WORLD CANCER RESEARCH DAY

On Tuesday 24 September we celebrated World Cancer Research Day in the CCRCB enabling us to highlight the amazing work of all our colleagues and collaborators. In the morning we were delighted to have Q Radio broadcasting live from the CCRCB, with host Yasmin Zemmoura sharing the incredible impact our research is having across Northern Ireland. In addition to a number of CCRCB staff and students, Yazz interviewed Mr John Creswell, who was generous enough to share his personal story of prostate cancer diagnosis and treatment, including his experience as a patient participating in the SPORT* study.

Hearing John's appreciation of CCRCB research was wonderful, "To get to the stage of clinical trial requires a lot of ground-breaking work being carried out in a laboratory and may involve many hours and years of painstaking work. To have this centre of excellence based here in Belfast is testimony to the skill and dedication of the staff at Queen's University Belfast and the Belfast Cancer Centre."

In addition to our live radio show, we opened our doors to over 100 cancer patients, carers and supporters of the Queen's Foundation. In particular, Ruth Boyd from the NI Cancer Trials Network arranged for the members of the NI Cancer Research Consumer Forum to attend on the day. We showed our visitors the labs in the main CCRCB labs and the Genomics Core Technology Unit, alongside a visit to the HBS site to see the work ongoing within the NI Biobank and Precision Medicine Centre. Based on feedback from the day, it is fair to say that everyone felt truly inspired by what they saw and heard, which is testament to all the important work ongoing with the CCRCB.

The CCRCB Public Engagement Committee, who organised the event, would like to thank everyone who visited and the staff who participated during their working day, especially everyone who spoke to Q Radio and hosted the tours.

* A Study Evaluating Stereotactic Prostate Radiotherapy in High-Risk Localised Prostate Cancer

WEAR IT PINK COFFEE MORNING

We had a great turnout with a huge assortment of cakes and buns donated by CCRCB staff and students. Clements (Queen's MBC) kindly provided tea and coffee in support of Wear It Pink Day. In total £320 was raised for the Breast Cancer Now charity.

QUEEN'S UNIVERSITY BELFAST

Patrick G Johnston Centre for Cancer Research
School of Medicine, Dentistry and Biomedical Sciences
Queen's University Belfast, 97 Lisburn Road, Belfast, BT9 7AE
T: +44 (0) 28 9097 2760
W: www.qub.ac.uk/ccrcb