Queen's University Belfast

CCRCB Centre for Cancer Research & Cell Biology

Bulletin

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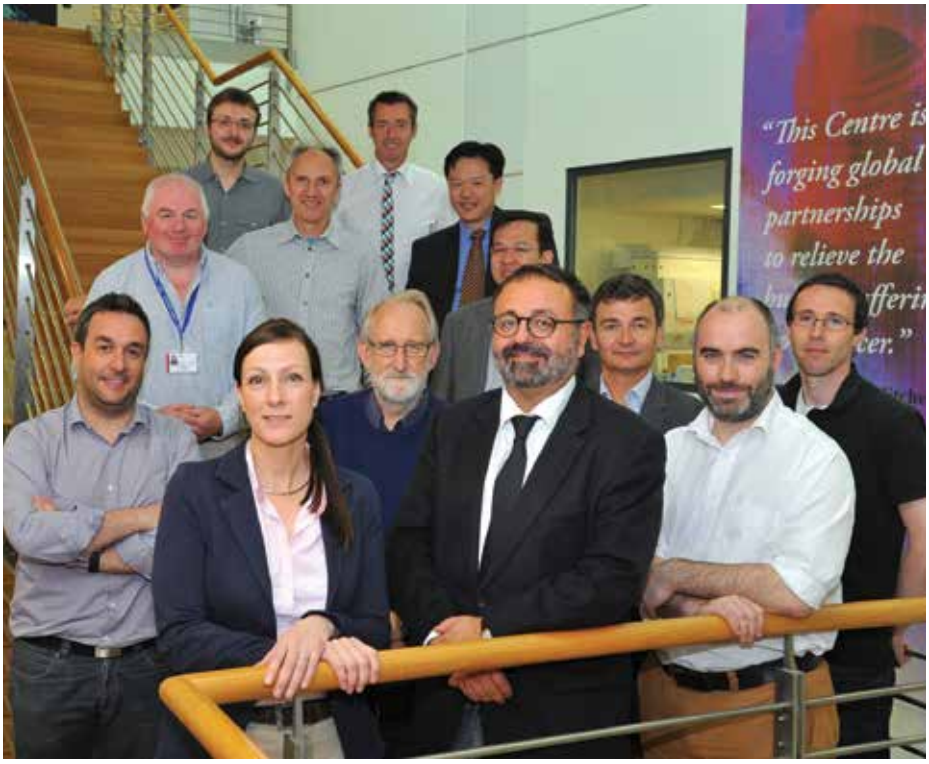
NATIONAL CRUK AWARD FOR CCRCB RESEARCHERS

Cancer experts from CCRCB have received a major award exceeding £3.6M from Cancer Research UK aimed at developing a national digital pathology programme to assist and accelerate the delivery of Precision Medicine in the UK. The CRUK Accelerator Award brings together a consortium of cancer pathologists, biologists and immunologists from the Belfast Cancer Research UK Centre, who will work in partnership with researchers from the Universities of Southampton, Manchester and Newcastle, University College London and the Institute of Cancer Research. Researchers from each of the collaborating UK academic institutes met at CCRCB on 19–20 August 2015 to launch this new initiative.

Already recognised as experts in identifying faulty genes and molecules in tumours, the Belfast team will now lead this nationwide research programme dedicated to expanding the application and use of digital pathology to quantify specific tumour markers. The programme will be supported using software from PathXL, a Queen's University spin-out company which specialises in high resolution imaging of tumours and cloud-based digital pathology.



Members of the Accelerator consortium who attended the launch meeting in CCRCB on 19 - 20 August 2015

Queen's Professor David Waugh, Director of the Centre for Cancer Centre and Cell Biology, said: "The selection of this research programme submitted by the Belfast CRUK Centre is further proof that Queen's cancer researchers are at the cutting edge of the latest innovations to improve outcomes for cancer patients across the world. Through this new research programme we will develop knowledge that can inform the targeted use of immunotherapeutic agents in cancer patients. We are thrilled to receive this award and I congratulate my colleagues Professor Manuel Salto-Tellez and Professor Peter Hamilton, in leading this successful bid. It is further recognition of the powerful alliance that our Centre is forging with local and international industry to deliver new advances in cancer care."

Queen's University Belfast will also lead the education and training programme in pathology that underpins the national network.

Professors Manuel Salto-Tellez and Peter Hamilton, Professors of Molecular and Digital Pathology respectively at Queen's University, added: "Traditionally, researchers have used standard slides to examine tissue cells under the microscope. However, in recent years our research at Queen's has pioneered the way to exploit digital technology to revolutionize the way we look at tumours, enabling us to obtain a deeper understanding of the cancer and provide a more detailed diagnosis to clinicians, as well as better tools for our scientists."

Professor Hamilton said: "This award demonstrates how Belfast has been leading in digital biotechnology for cancer research and diagnostics. This CRUK funding will allow Belfast and the wider UK team to accelerate cancer discovery using these novel technologies, promote their application in clinical practice and maintain Belfast CRUK Centre's reputation as a world leader in digital molecular pathology."

Des Speed, CEO of PathXL, said: "We are delighted that this innovative research project is progressing to implementation, and are looking forward to working with all centres in the consortium. It is very exciting to be at the forefront of this UK-wide strategy for digital and molecular pathology in cancer, which has the potential to drive dramatic change. This award is further recognition that Northern Ireland is leading the way in developing digital pathology, and of the strength of the PathXL software platform."

AWARD TO DEVELOP NEW PANCREATIC CANCER TREATMENTS

A US-Ireland partnership involving researchers at Queen's has been awarded £2.9m to develop new treatments for pancreatic cancer, which is the fifth most common cause of cancer deaths in the UK. The grant has been awarded under the US-Ireland Research and Development Partnership Programme. It will bring together world-leading experts in drug delivery and cancer research at Queen's, Dublin City University and the University at Buffalo.

The five-year programme will focus on the development of 'nanomedicine' in the treatment of pancreatic cancer, for which current treatment options are limited. The transatlantic team aims to develop miniscule technology – so tiny that it is invisible to the naked eye – to deliver drugs directly to cancer sites and thereby improve the effectiveness of chemotherapy treatments.

Almost 9,000 people are diagnosed with pancreatic cancer in the UK every year. It has the lowest five-year survival rate of any common cancer and one that has barely improved in 40 years. In Northern Ireland, during 2009-2013 an average of 220 cases of pancreatic cancer were diagnosed each year. The five-year survival rate for patients diagnosed in 2004-2008 was 5%. Pancreatic cancer is often very advanced by the time it is diagnosed and only 3% of patients are still alive five years after diagnosis. More than 80% of people with the disease are diagnosed when it has already spread, so they are not eligible for surgery to remove the tumour – currently the only potential cure.

This partnership is a unique arrangement involving funding agencies in the USA, the Republic of Ireland and Northern Ireland who combine resources to enable the best researchers from Ireland and the USA to work together on research to address critical issues and generate valuable discoveries that will impact on patient care.

Professor Chris Scott

Professor Christopher Scott, Director of Research, Molecular Therapeutics Cluster in Queen's School of Pharmacy, who is leading the project, said: "Pancreatic cancer is the fifth most common cause of cancer deaths in the UK. Many chemotherapies could be more effective, and induce fewer side effects, if they could access the tumour more easily; this is what we aim to examine in this project. By working in partnership with researchers in New York and Dublin it will allow us to generate valuable discoveries and innovations which can move our work out of the laboratory and towards clinical trials. This is another example of the commitment of researchers and staff at Queen's to advancing knowledge and changing lives."

Dr Janice Bailie, Assistant Director of the Public Health Agency's HSC R&D Division, which is funding the Northern Ireland part of this project with support from the Medical Research Council, said: "We are delighted to be funding this project which will tackle an important area around drug delivery in pancreatic cancer which we know is a difficult disease to treat. We expect that the outcomes from this international research will lead to significant advances in the treatment of patients with pancreatic cancer in the UK, Ireland and beyond."

BIR / SABR SCIENTIFIC MEETING

The first British Institute of Radiation (BIR) / UK Stereotactic Ablative Radiotherapy Consortium (SABR) Scientific Meeting was held at Riddel Hall on 19 and 20 November 2015. The meeting was organised and hosted by Dr Gerry Hanna and Dr Suneil Jain from CCRCB, with the support of Professor Kevin Prise and Professor Joe O'Sullivan.

This unique event was the first of its kind in the UK, encompassing an excellent programme of talks and a number of renowned international speakers. The meeting provided attendees with state of the art lectures on current best practice for SABR in a range of indications, for common tumour primaries and common treatment sites.

The educational component covered all aspects of SABR treatment from patient selection, through treatment planning, treatment delivery and patient follow-up. The meeting also showcased current and proposed UK and International SABR research and provided useful networking opportunities for researchers with an interest in SABR.

BELFAST NAMED AS LOCATION FOR A PRECISION MEDICINE CATAPULT CENTRE OF EXCELLENCE

The Centre for Cancer Research and Cell Biology (CCRCB) will be involved in a new UK centre of excellence to understand and treat patients' illnesses more precisely.

The Precision Medicine Catapult has announced that Belfast will be one of six initial locations for its regional centres of excellence network, alongside Cardiff, Glasgow, Leeds, Manchester and Oxford. Each centre will act as a hub for research and development in precision medicine, which uses diagnostic tests and data-based insights to understand a patient's illness more precisely and select treatments with more predictable, safer and cost-effective outcomes.

Speaking about the announcement, Queen's Vice-Chancellor Professor Patrick Johnston said: "Queen's is pleased to be involved in the UK's new national innovation centre for precision medicine. The decision to establish a regional centre of excellence in Belfast is testament to Northern Ireland's excellence in terms of research and clinical expertise in precision medicine. Queen's is already conducting life-changing and life-saving research in this area. We look forward to continuing that important work alongside our partners in the Precision Medicine Catapult to make the UK the most attractive place in the world in which to develop precision medicine tests and therapies."

Catapults are a UK Government initiative, established and part-funded by Innovate UK, where the best of the UK's innovative businesses and researchers work together to bring new products and services to commercialisation. The Precision Medicine Catapult was established in April 2015 to harness the breadth of UK expertise, developing innovative technologies and solutions for broader use across the UK's healthcare sector.

A physical presence will be established at each centre, with local recruitment to build expert teams. The centres will work collaboratively with local, national and global stakeholders including government, academia, health systems and SMEs, with broad industry engagement to identify and resolve barriers to building a leading UK precision medicine industry.

John McKinley, CEO of the Precision Medicine Catapult, said: "We're delighted to announce the location of these centres of excellence, each with access to a unique blend of regional expertise. Project development work has been ongoing across the UK and we will be launching offices and related programmes over the coming months. As well as growing the UK's strong position in precision medicine, we believe our network will deliver health and economic impact at a local and national level."

Chief Medical Officer, Dr Michael McBride said: "Precision medicine allows clinicians to select treatments for patients which are more targeted, more predictable in terms of response and ultimately safer and more cost-effective. Northern Ireland already has world leading companies and expertise operating in this growing field. The location of a Precision Medicine Catapult centre of excellence in Northern Ireland recognises the expertise and innovation that exists within our health and care service and can help ensure that the care we provide to our patients becomes ever more effective."

Jennifer Welsh, Director of Surgery and Specialist Services in Belfast Trust said: "This announcement is recognition that Belfast is in a leading position in terms of developing precision medicine tests and therapies. This is building on years of collaboration between Belfast Trust and key partners such as the Pathology Network and Queen's University. It is an exciting time which will bring significant long-term benefits to our patients."

For more information visit www.catapult.org.uk

ENTERPRISE, TRADE AND INVESTMENT COMMITTEE VISIT CCRCB

Members of the Enterprise, Trade and Investment Committee visited the Centre for Cancer Research and Cell Biology on Thursday 15 October 2015. Committee members heard from Professor David Waugh, Director of the Centre for Cancer Research and Cell Biology, Professor Paul Harkin, Almac and Mr Mark Campbell, Randox on the partnership between Queen's University and the pharmaceutical sector both in Northern Ireland and internationally. The Committee were also informed about the economic and health benefits for Northern Ireland arising from this sector.

Mr Máirtín Ó Muilleoir MLA, Professor Tony Gallagher (Pro-Vice-Chancellor, Planning and Public Engagement), Professor David Waugh (Director, CCRCB), Mr Patsy McGlone MLA (Chair of the Enterprise, Trade and Investment Committee), Mr Fearghal McKinney MLA and Professor Paul Harkin (Almac and CCRCB)

SCIENCE BUSKING AT CULTURE NIGHT

Eight CCRCB researchers volunteered to do a bit of 'science busking' at Culture Night Belfast on 18 September 2015. As the event name suggests, this is an arts-themed evening, with over 50,000 people converging on Belfast city centre for a wide range of free events and activities.

The CCRCB was invited to participate in the 'science in the square' part of this event which took place in Lombard Street. Complete with CRUK lab coats and busking trays, eight researchers ventured out to talk to the public about their work. They offered three activities to get people interested – a genetic taste test, targeted therapy game and finding the key/drug discovery – and then were able to tell people about their research and the work that happens in the CCRCB. They engaged with over 600 people across all ages. This was a great result and brought information about cancer research in Belfast to an entirely new audience.

CCRCB researchers bring science to Belfast City Centre as part of Culture Night

NEW CRUK RESEARCH ENGAGEMENT MANAGER — CAROLINE CROTHERS

Caroline Crothers joined the Belfast Cancer Research UK's Centre as the new Research Engagement Manager in late September.

As the Research Engagement Manager, Caroline's role is to engage the public in Northern Ireland with the research taking place in their community. Caroline engages these different audiences in a variety of ways, arranging talks about CRUK funded research and bringing the research to life through interactive lab tours in CCRCB. Also finding opportunities for researchers to go out and speak about their work in the community in order to reach more people and build greater support for the world-class research taking place at the Centre.

Following on from the success of the inaugural Open Day in 2015, Caroline will be seeking to expand this for 2016 and increase the programme of events in the NI Science Festival which is also taking place in 2016.

Caroline works closely with the press teams at CRUK and the other Centre partners to ensure that exciting new developments make the news and raise the profile of the Centre and is an active member on twitter, tweeting about her activities and any cancer research developments.

Before joining us, Caroline worked for the past four years for Leukaemia & Lymphoma NI, who are also based in CCRCB.

To contact Caroline, email: caroline.crothers@cancer.org.uk, follow on twitter: @crukbelfast or call: 028 9097 2987.

Research Engagement Manager, Caroline Crothers

CANCER RESEARCH UK GRAND CHALLENGE

Grand Challenge awards are the most ambitious cancer research grants in the world. They're intended to catalyse a revolution in how we prevent, diagnose, and treat cancer by bringing together the brightest minds around the globe, providing the freedom to undertake innovative, game-changing research.

Cancer Research UK are looking for applications from interdisciplinary teams with novel, exciting ways of solving one of seven Grand Challenges, which together encompass some of the most important unanswered questions in cancer research. If you can convince us you're on to something extraordinary, we'll give your team up to £20m to prove it. Cancer Research UK is seeking scientific adventurers who are willing to take risks in exchange for the ultimate reward – making cancer a disease that no longer inspires fear. If you can rise to the challenge, come and change the future with us.

NEW APPOINTMENT MR STUART MCINTOSH

Mr Stuart McIntosh was appointed as a Clinical Senior Lecturer at Queen's University Belfast in October 2015. A graduate of the University of Edinburgh, Stuart undertook the majority of his surgical training in Scotland, with spells in clinical research in Glasgow and Cambridge, before obtaining a National Oncoplastic Fellowship in Leeds at the end of his training. Initially appointed as a consultant surgeon in Aberdeen in 2005, he moved to Belfast in 2009 to take up a post as consultant breast surgeon in Belfast City Hospital.

Since his appointment six years ago, Stuart has overseen a variety of developments within the breast service in the City Hospital, including expansion of the clinical trials portfolio to allow increasing access to clinical trials for breast cancer patients. He was appointed as Deputy Clinical Director of the NI Cancer Trials Network in 2013, and is a member of the NCRI Breast Clinical Studies Group as well as of the Association of Breast Surgery's Academic and Research Committee.

Stuart's current research interests are focused around personalising the surgical management of breast cancer, including managing women at high risk of breast cancer, the pre-surgical treatment of breast cancer, and the role of three dimensional surface imaging technologies in breast reconstruction surgery.

Mr Stuart McIntosh

PRIZES AND MEASURES OF ESTEEM

Professor Kevin Prise

Congratulations to **Professor Kevin Prise**, CCRCB Deputy Director, who has been chosen as Vice-President-Elect of the US Radiation Research Society, having been nominated via a ballot of all its members. Professor Prise leads the Radiation Biology Group at CCRCB, which is working on improved approaches for treating cancer with radiotherapy. In collaboration with Professor Joe O'Sullivan (Clinical Director) and Professor Alan Hounsell (Clinical Physics Research Lead), Professor Prise plays a major role in the Prostate Cancer UK Movember Centre of Excellence at CCRCB, which is researching new approaches for treating men who are likely to fail current treatments for prostate cancer.

Speaking about his appointment, Professor Prise said: "This is a rare privilege and exciting challenge, especially for a non-US member of the Society. This role is a great opportunity to profile internationally the work we are doing at Queen's and the Centre for Cancer Research and Cell Biology to improve outcomes for cancer patients."

Professor Prise will take up the position of Vice-President in September 2016 and will serve as President from September 2017.

Professor Kevin Prise has also been appointed Editor-in-Chief (Scientific) of the British Journal of Radiology, and has been appointed to the UK Department of Health Expert Committee on Medical Aspects of Radiation in the Environment (COMARE).

Dr Sandra Irvine was appointed to the NCRI Clinical Studies Group for colo-rectal cancer as PPI representative for 3 years from July 2015.

Mr Matthew Alderdice is presented with the Teenage Cancer Trust Stephen Sutton Prize

Mr Matthew Alderdice was awarded the Teenage Cancer Trust Stephen Sutton Prize (first prize) at the NCRI 2015 Annual Conference for his paper entitled 'Natural Killer Cell-like signature observed in locally advanced rectal cancer after neoadjuvant chemoradiotherapy in a tumour regression grade dependent manner.'

MOVEMBER RETURNS TO CCRCB

Movember returned to the CCRCB, as staff and students actively participated in another month of moustache growing, fundraising and increasing awareness of men's health issues. In addition, there was a big focus on physical activity in an attempt to promote Movember's new initiative - MOVE - which was set up to encourage participants to exercise more over a 30 day period. The 2015 Movember campaign was incredibly successful overall and included joint fundraising efforts with the Belfast Health and Social Care Trust.

The Movember Foundation started in 2003 when 30 men from Australia decided to bring back the moustache without raising a single penny. Since then, the movement has spread across 21 countries, raising £402 million that has been used to fund 832 men's health projects worldwide. The annual moustache growing event promotes discussion and awareness of men's mental health, testicular cancer and prostate cancer and supports worldwide charities tackling these issues. In the UK, the campaign funds programmes in partnership with Prostate Cancer UK.

In 2014, the CCRCB became a Movember Centre of Excellence in partnership with researchers and clinicians at the University of Manchester. The primary focus of this partnership is on recurrent prostate cancer, improving methods of detection and personalised treatment. Additionally, research into refining and improving radiotherapy is being conducted with the aim of preventing recurrence. This year's campaign continued the trend of being bigger and better than the previous year. Events included a spinathon outside the Cancer Centre, a moustache-themed bake sale, a pub quiz and a pedometer challenge spanning over two weeks, which challenged participants to take over 100,000 steps. Staff and students from the CCRCB also took to the football pitch against staff from the Belfast Health and Social Care Trust. Although we enjoyed a friendly rivalry with our neighbours from the Cancer Centre, Movember were the real winners from this campaign!

Staff from CCRCB at the Movember Spinathon in the Cancer Centre

STAND UP TO CANCER RELAY

Two hundred staff from CRUK Research Centres and Institutes across the country took part in a seven day, 24 hour continuous relay to raise funds for Stand Up to Cancer. The Stand Up to Cancer relay kicked off at CCRCB in Belfast early on Friday 2 October. CCRCB scientists were there to cheer on CRUK Regional Manager Ryan McClintock, Senior Volunteer Fundraising Manager Mark McMahon and local radio DJ Sonya Mac as they ran from CCRCB to Belfast City Airport (while dressed as giant shoes!). The team then flew to Glasgow to pass the baton on to the Scottish team. The relay made its way across the UK, finishing one week later at the brand new research facility, The Francis Crick Institute in London.

CRUK Relay Runners Ryan McClintock, Sonya Mac and Mark McMahon (back row) with CCRCB researchers Robbie Carson, Lisa Rainey and Kelly Redmond (front row)

DONATIONS

For the first time in the Club's history, the Captain and Lady Captain of **Shandon Park Golf Club** in Belfast joined forces during their year in office (2014-15) to raise money for the same charitable cause - Lung Cancer Research at the Centre for Cancer Research & Cell Biology (CCRCB) at Queen's. Through a series of combined fundraising initiatives and collections taken up from members on their respective Captain's Day, Gerry Power and Lorna McNamara raised almost £18,000 to fund research work carried out by a group led by Dr Gerry Hanna in CCRCB.

Dr Hanna and his team are working to explore the mechanisms of resistance to radiotherapy at the cellular level. From identifying the pathways of resistance it is hoped that new treatments can be developed to improve the effectiveness of radiotherapy treatment.

Club Captain Gerry Power said: "Lung cancer is the commonest cause of cancer death in the UK and although most cases are related to smoking, 15% of those with it have never smoked. One such cancer is Mesothelioma, which occurs in people exposed to asbestos, such as those – like my late father-in-law, John Davidson – who worked in the Belfast shipyard, Harland and Wolff. John was my personal inspiration for supporting what is often an overlooked cancer cause. Lorna and I are most grateful to all who supported our joint Captains' Appeal. The funds raised will give new hope to lung cancer patients and will help transform the future for those who are living with this awful disease."

If you are interested in supporting the work of CCRCB please contact Alice O'Rawe, Fundraising Manager (Medicine), email alice.orawe@qub.ac.uk or tel: 028 9097 5233.

Ivy and Harry Bradley, from Loughgall, recently presented a cheque for £600 to the Centre for Cancer Research and Cell Biology (CCRCB) at Queen's University Belfast. The proceeds, which will support breast cancer research, came from Ivy's 70th birthday party, when she asked family and friends for donations instead of personal gifts.

The **Gault and Murphy families** from Newtownabbey, Co Antrim, presented a cheque for £9,350 to Dr Gerry Hanna, Senior Lecturer/ Consultant at the Centre for Cancer Research and Cell Biology (CCRCB) at Queen's to support lung cancer research. The proceeds came from a marathon relay run and a number of coffee mornings. While in CCRCB, group members were given a guided tour of the laboratories by Dr Hanna.

Pictured (front row, L-R) with Alice O'Rawe, Fundraising Manager (Medicine) are Heather Gault, Dr Gerry Hanna and Carol Murphy and (back) Derrick and Audrey Murphy.

Kathryn Williams (centre) visited CCRCB in August, having raised £3,316 for prostate cancer research by participating in the Belfast Marathon. Also pictured are (left to right) Fundraising Manager Rachel Ketola, Pauline Scott (Kathryn's mother), Dr Chris Armstrong, Professor Joe O'Sullivan and Dr Kelly Redmond.

In September **Rachael Forde** raised over £2,600 by completing Hell and Back, Ireland's Toughest Mental & Physical Endurance Challenge to support BRCA research. She completed a 10-15KM trail route crossing rivers and lakes, climbing hills and mountains and crawling through bogs and swamps. Well done Rachael.

QUEEN'S PROFESSOR LAUNCHES "EUROPE OF DISPARITIES IN CANCER" AT EUROPEAN CANCER CONGRESS IN VIENNA

Professor Mark Lawler speaking at the European Cancer Congress

Professor Mark Lawler, Queen's University Belfast and European Cancer Concord, launched the Europe of Disparities in Cancer Policy Paper at the European Cancer Congress organised by the European Cancer Organisation (ECCO) in Vienna on 27 September 2015. Europe of Disparities in Cancer is a joint initiative with the European Cancer Patient Coalition (ECPC), the largest cancer patient advoicacy group in Europe, and Professor Lawler was Chair of the Working Group that developed the policy paper.

The paper highlights shocking figures recounting disparities across Europe. In Poland for example, lung cancer mortality is 83% (EU Average 56.4%) while in Romania, the mortality rate for cervical cancer is 14.2%, compared with an EU average of 3.7%. And these inequalities are not just confined to Eastern Europe. The United Kingdom and Denmark have significantly poorer survival rates, particularly for lung, colorectal and ovarian cancers, when compared with Norway and Sweden, while many European countries have insufficient capacity to deliver optimal radiotherapy services.

Francesco de Lorenzo, President of ECPC indicated that: "it is not acceptable that European citizens and their families experience these healthcare inequalities. Cancer has no boundaries and the ECPC and its patients want to shed light on policy responses which can be employed to overcome this situation."

Significant inequalities in access to optimal care exist, including access to radiotherapy, surgery, medicines and innovative treatments. The paper highlights that healthcare budgets underpin certain inequalities but that an increased spend does not always correlate with improved patient care. Members of the Europe of Disparities in Cancer Working Group warn about the additional negative impact of austerity and cost-containment measures in a number of European countries. For example Greece, against EU recommendations, has reduced its screening programmes for breast and cervical cancers – risking an increase in undetected cancers that may lead to increases in mortality.

Solutions include the issuing of guidelines on optimal radiotherapy capacity; providing patients with accurate surgical oncology activity data to allow informed decision-making on choice of accredited center; addressing shortage and facilitating access to life-preserving and life-enhancing medicines with the support of a harmonized assessment for therapeutic interventions at EU level and the development of a European Centre for Cancer Control.

"In 17 countries of the European Union, cancer has overtaken cardiovascular disease as the leading cause for premature death. In Europe in 2012, there were 3.75 million new cases of cancer, with 1.75 million deaths, equivalent to a cancer death every 20 seconds. Pressure on appropriate health spending and the needs of ageing populations need to be factored in, otherwise by 2050 we will face an epidemic of such proportions that in certain countries, a European citizen will die from cancer every 5 seconds", argued Professor Lawler, Chair of the Working Group. "We can no longer tolerate these disparities. The time to act is now."

A video with Professor Lawler's speech , filmed at the launch in Vienna is available at: https://www.youtube.com/watch?v=_TbpN_-gjaM&feature=youtu.be

An interview with Professor Lawler for ecancerTV, which is attracting significant interest is available at: https://www.youtube.com/watch?v=_TbpN_-gjaM&feature=youtu.be

NI CLINICAL INNOVATION CONFERENCE

The second Northern Ireland Clinical Innovation Conference was held in Riddel Hall, Queen's University Belfast, on 7 - 8 October 2015. Staff from CCRCB and the NI Cancer Trials Network (NICTN) contributed to the dynamic programme enjoyed by 200 delegates from 21 global pharmaceutical companies, academia, local life science businesses, health and social care, patient groups and government. The event focused on increasing the number and scale of international medical research partnerships in Northern Ireland, and showcased Northern Ireland's clinical and academic biomedical research capability, infrastructure and world class research outcomes. Dr Donna Graham, Dr Suneil Jain, Professor Richard Kennedy, Professor Mark Lawler, Dr Richard Turkington and Professor Richard Wilson were among those from cancer research involved in conference sessions, as was Mrs Margaret Grayson, Chair of the NI Cancer Research Consumer Forum (NICRCF). The NICRCF, NICTN and NI Biobank also participated in the NI capability exhibition.

The event was jointly organised by the Association of the British Pharmaceutical Industry Northern Ireland Innovation Group, Health and Social Care (HSC) Innovations, the HSC Research & Development Division of the Public Health Agency, Invest NI, Queen's University Belfast and Ulster University.

Maura McAlister, Margaret Grayson, Ruth Boyd, Mary Gordon (NICRCF members) with Dr Melanie Morris, Dr Suneil Jain and Dr Richard Turkington at the conference opening event

PROSTATE CANCER FOUNDATION CHIEF SCIENCE OFFICER VISITS CCRCB

Dr Howard Soule, Executive Vice President and Chief Science Officer of the Prostate Cancer Foundation (PCF), visited CCRCB on Thursday 12 and Friday 13 November 2015. Dr Soule coordinates global academic, government and biopharmaceutical sector research activity and is responsible for the implementation of PCF's global research strategies.

During his visit to CCRCB Dr Soule met with a number of academic staff who are working in prostate cancer research. Dr Soule gave a special presentation introducing the work of PCF and the clinical-translational capabilities, and also spoke at a special Young Investigators' Forum, where he gave an overview of his career to date and answered questions on the Prostate Cancer Foundation. Dr Soule's visit also coincided with CCRCB's Movember fundraising coffee morning.

Dr Howard Soule (second from left) supporting the Movember coffee morning along with Dr Sharon Eddie, Dr Ian Mills, Professor David Waugh and Dr Chris Armstrong

PHOTO GALLERY

The McCloskey Group attended the International Ion Channels, Transporters and Cancer meeting at Imperial College London on 9 - 10 September 2015. Dr Karen McCloskey was an invited speaker and Dr Paul Buchanan and Ms Bailey Evans presented posters of their recent research (second row from front, 2-4 from right).

Dr Nuala McCabe speaking at the Prostate Cancer Foundation's Scientific Retreat, held in Washington on 8 – 10 October 2015.

Professor Manuel Salto-Tellez recently visited the Southern Regional College's Armagh campus and gave a talk to students studying science. Pictured with Professor Salto-Tellez is Patrick Byrne (SRC host) and students who attended the presentation.

Professor Mark Lawler, CCRCB and EORTC Ambassador, presents the prizes to the winning netball team at the Annual Alliance Boots charity football and netball tournament in Nottingham. Over £40,000 was raised for the EORTC Cancer Research Fund.

RECENT GRANTS AWARDED

Investigator(s)	Sponsor	Title	Amount	Start Date	End Date
Butterworth, Karl	GW Research Ltd	Investigation of radiobiological efficacy of cannabinol derivatives	£14,800	01/08/15	29/02/16
Hanna, Gerry Butterworth, Karl Prise, Kevin	Cancer Research UK	Assessment of tumour efficacy and normal tissue toxicity using AZD6738 in combination with radiotherapy for non-small cell lung cancer	£48,200	01/09/15	31/08/16
James, Jackie Hamilton, Peter	HSC R&D	NI Biobank Renewal	£1,908,000	01/09/15	31/08/20
Longley, Dan Wilson, Richard Kennedy, Richard Kissenpfennig, Adrien	SFI-DEL	Development of personalised medicine approaches for the clinical application of IAP antagonists	£637,289	01/09/15	31/08/19
McArt, Darragh McDade, Simon	Medical Research Council	Integrative environment for data acceleration, analysis and biomarker discovery	£20,000	01/03/15	31/08/16
Mullan, Paul McArt, Darragh	British Medical Association	T P Gunton Grant – James Beirne (DNA Methylationa Markers for Early Detection of Ovarian Cancer: the Key to Successful Population Screening)	£42,782	01/09/15	31/08/18
Prise, Kevin	Brainwaves NI	Brain Tumour Research	£58,600	01/11/15	31/10/16
Van Schaeybroeck, Sandra	Cancer Research UK	To investigate the effect on tumour volume of the AZD0424 and MEK inhibitor	£69,247	01/08/15	31/07/16

RECENT PUBLICATIONS

ALVI, M.A., McART, D.G., KELLY, P., FUCHS, M.A., ALDERDICE, M., McCABE, C.M., BINGHAM, V., MCGREADY, C., TRIPATHI, S., EMMERT-STREIB, F., LOUGHREY, M.B., McQUAID, S., MAXWELL, P., HAMILTON, P.W., TURKINGTON, R., JAMES, J.A., WILSON, R.H. and SALTO-TELLEZ, M. (2015) Comprehensive molecular pathology analysis of small bowel adenocarcinoma reveals novel targets with potential for clinical utility, *Oncotarget*, 6(25), p20863-74.

ANDERSON, L.A., JAMES, G., DUNCOMBE, A.S., MESA, R., SCHERBER, R., DUECK, A.C., DEVOCHT, F., CLARKE, M. and McMULLIN, M.F. (2015) Myeloproliferative neoplasm patient symptom burden and quality of life: Evidence of significant impairment compared to controls, *American Journal of Hematology*, 90(10), p864-70.

BADUSHA MOHAMED YOOSUF, A., MITCHELL, D.M., WORKMAN, G., JONNADA, S., NAPIER, E. and JAIN, S. (2015) Sector analysis provides additional spatial information on the permanent prostate brachytherapy learning curve, *Brachytherapy*, 14(5), p707-10.

BEIRNE, J.P., McART, D.A., JAMES, J.A., SALTO-TELLEZ, M., MAXWELL, P. and McCLUGGAGE, W.G. (2015) p16 as a Prognostic Indicator in Ovarian/ Tubal High Grade Serous Carcinoma, *Histopathology*, 14 July 2015 (Epub ahead of print).

BEIRNE, J.P, IRWIN, G.W., McINTOSH, S.A., HARLEY, I.J.G. and HARKIN, D.P. (2015) The molecular and genetic basis of inherited cancer risk in gynaecology, *The Obstetrician & Gynaecologist*, 17, p233–41.

BENNETT, R., YAKKUNDI A., McCLEMENTS, L., McKEEN, H.D., McKEOGH, T.J., ARTHUR, K., ROBSON, T. and McCARTHY, H.O. (2015) RALA-mediated delivery of FKBPL nucleic acid therapeutics, *Nanomedicine: Nanotechnology, Biology, and Medicine*, 30 September 2015 (Epub ahead of print).

BRIEN, G.L., HEALY, E., JERMAN, E., CONWAY, E., FADDA, E., O'DONOVAN, D., KRIVTSOV, A.V., RICE, A.M., KEARNEY, C.J., FLAUS, A., McDADE, S.S., MARTIN, S.J., McLYSAGHT, A., O'CONNELL, D.J., ARMSTRONG, S.A. and BRACKEN, A.P. (2015) A chromatin-independent role of Polycomb-like 1 to stabilize p53 and promote cellular quiescence, *Genes Dev.*, 22 October 2015.

BURNETT, A.K., RUSSELL, N.H., HILLS, R.K., BOWEN, D., KELL, J., KNAPPER, S., MORGAN, Y.G., LOK, J., GRECH, A., JONES, G., KHWAJA, A., FRIIS, L., McMULLIN, M.F., HUNTER, A., CLARK, R.E. and GRIMWADE, D. (2015) Arsenic trioxide and all-trans retinoic acid treatment for acute promyelocytic leukaemia in all risk groups (AML 17): Results of a randomised, controlled, phase 3 trial, *Lancet Oncology*, 16(13), p1295-1305.

CHAUDHARY, P., MARSHALL, T.I., CURRELL, F.J., KACPEREK, A., SCHETTINO, G. and PRISE, K.M. (2015) Variations in the processing of residual DNA double strand breaks along 60 MeV therapeutic proton beams, *International Journal of Radiation Oncology, Biology and Physics*, 29 July 2015 (Epub ahead of print).

COULTER, J.A., BUTTERWORTH, K.T. and JAIN, S. (2015) Prostate cancer radiotherapy: potential applications of metal nanoparticles for imaging and therapy, British Journal of Radiology, 88 (1054), p20150256.

DUNNE, P.D., DASGUPTA, S., BLAYNEY, J.K., McART, D.G., REDMOND, K.L., BRADLEY, C., SASAZUKI, T., SHIRASAWA, S., WANG, T., SRIVASTAVA, S., ONG, C.W., ARTHUR, K., SALTO-TELLEZ, M., WILSON, R., JOHNSTON, P.G. and VAN SCHAEYBROECK, S. (2015) EphA2 expression is a key driver of migration and invasion and a poor prognostic marker in colorectal cancer, *Clinical Cancer Research*, 17 August 2015 (Epub ahead of Print).

ELLIOTT, K., McQUAID, S., SALTO-TELLEZ, M. and MAXWELL, P. (2015) Immunohistochemistry should undergo robust validation equivalent to that of molecular diagnostics, *J Clin Pathol.*, 68(10), p766-70.

HAMILTON, P.W., WANG, Y., BOYD, C., JAMES, J.A., LOUGHREY, M.B., HOUGTON, J.P., BOYLE, D.P., KELLY, P., MAXWELL, P., McCLEARY, D., DIAMOND, J., McART, D.G., TUNSTALL, J., BANKHEAD, P. and SALTO-TELLEZ, M. (2015) Automated tumor analysis for molecular profiling in lung cancer, *Oncotarget*, 6(29), p27938-52.

HANNA, G.G. and LANDAU, D. (2015) Re: Stereotactic Body Radiotherapy for Oligometastatic Disease, *Clin Oncol (R Coll Radiol).*, 27(9), p543-4.

HANNAN, F.M., HOWLES, S.A., ROGERS, A., CRANSTON, T., GORVIN, C.M., BABINSKY, V.N., REED, A.A., THAKKER, C.E., BOCKENHAUER, D., BROWN, R.S., CONNELL, J.M., COOK, J., DARZY, K., EHTISHAM, S., GRAHAM, U., HULSE, T., HUNTER, S.J., IZATT, L., KUMAR, D., McKENNA, M.J., McKNIGHT, J.A., MORRISON, P.J., MUGHAL, M.Z., O'HALLORAN, D., PEARCE, S.H., PORTEOUS, M.E., RAHMAN, M., RICHARDSON, T., ROBINSON, R., SCHEERS, I., SIDDIQUE, H., VAN'T HOFF, W.G., WANG, T., WHYTE, M.P., NESBIT, M.A. and THAKKER, R.V. (2015) Adaptor protein-2 sigma subunit mutations causing familial hypocalciuric hypercalcaemia type 3 (FHH3) demonstrate genotype-phenotype correlations, codon bias and dominant-negative effects, *Hum Mol Genet.*, 24(18), p5079-92.

HORGAN, D., PARADISO, A., McVIE, G., BANKS, I., VAN DER WAL, T., BRAND, A. and LAWLER, M. (2015) Is precision medicine the route to a healthy world? *Lancet*, 386, p336-7.

HORN, S., BRADY, D. and PRISE K.M. (2015) Alpha particle induced pan nuclear phosphorylation of H2AX and ATM is driven through chromatin remodelling, *BBA Molecular Cell Research*,1853, p2199-2206.

HUTCHINSON, R.A., ADAMS, R.A., McART, D.G., SALTO-TELLEZ, M., JASANI, B. and HAMILTON, P.W. (2015) Epidermal growth factor receptor immunohistochemistry: new opportunities in metastatic colorectal cancer, *J Transl Med.*,13, p217.

KIRBY, A.M., HANNA, G.G., WILCOX, M. and MacKENZIE, M. (2015) In regard to Vaidya et al., *Int J Radiat Oncol Biol Phys*, 92(5), p957-958.

LAWLER, M. and MAUGHAN, T.S.: S-CORT Consortium. Precision medicine for colorectal cancer patients: Time to get Personal! *Eurodigest (J Eur Soc Primary Care Gastro)*, 2, p29-31.

LAWLER, M., SIU, L.L., REHM, H.R., CHANOCK, S.J., ALTEROVITZ, G., BURN, J., CALVO, F., LACOMBE, D., THE, B.T., NORTH, K.N. and SAWYERS, C.L. (2015) All the World's a Stage. Facilitating Discovery Science and Improved Cancer Care through the Global Alliance for Genomics and Health, *Cancer Discovery*, 5, p1133-6.

LAWLER, M., GAVIN, A., SALTO-TELLEZ, M., KENNEDY, R.D., VAN SCHAEYBROECK, S., WILSON, R.H., HARKIN, D.P., GRAYSON, M., BOYD, R.E., HAMILTON, P.W., McART, D.G., JAMES, J.A., ROBSON, T., LADNER, R.D., PRISE, K.M., O'SULLIVAN, J.M., HARRISON, T., MURRAY, L.J., JOHNSTON, P.G. and WAUGH, D.J. (2015) Delivering a research-enabled multi-stakeholder partnership for enhanced patient care at a population level: The Northern Ireland Comprehensive Cancer Program, *Cancer* (In Press).

LAWLER, M. and SULLIVAN, R. (2015) Personalised and Precision Medicine in Cancer Care: Panacea for Progress or Pandora's Box, *Public Health Genomics* (Special Issue), 11 November 2015 (Epub ahead of print).

LAWLER, M., HORGAN, D. and BRAND, A. (2015) Getting personal: Accelerating personalised and precision medicine integration into clinical cancer research and care, *Public Health Genomics* (Special Issue), 14 November 2015 (Epub ahead of print).

LER, S.Y., LEUNG, C.H., KHIN, L.W., LU, G.D., SALTO-TELLEZ, M., HARTMAN, M., IAU, P.T., YAP, C.T. and HOOI, S.C. (2015) HDAC1 and HDAC2 independently predict mortality in hepatocellular carcinoma by a competing risk regression model in a Southeast Asian population, *Oncol Rep.*, 34(5), p2238-50.

LOUGHREY, M.B., KELLY, P.J., HOUGHTON, O.P., COLEMAN, H.G., HOUGHTON, J.P., CARSON, A., SALTO-TELLEZ, M. and HAMILTON, P.W. (2015) Digital slide viewing for primary reporting in gastrointestinal pathology: a validation study, *Virchows Arch.*, 467(2), p137-44.

LOVEDAY, C., TATTON-BROWN, K., CLARKE, M., WESTWOOD, I., RENWICK, A., RAMSAY, E., NEMETH, A., CAMPBELL, J., JOSS, S., GARDNER, M., ZACHARIOU, A., ELLIOTT, A., RUARK, E., VAN MONTFORT, R., Childhood Overgrowth Collaboration and RAHMAN, N. (2015) Mutations in the PP2A regulatory subunit B family genes PPP2R5B, PPP2R5C and PPP2R5D cause human overgrowth, *Hum Mol Genet.*, 24(17), p4775-9.

McGARRY, C.K., AGNEW, C.E., HUSEESIN, M., TSANG, Y., McWILLIAM, A., HOUNSELL, A.R. and CLAK, C.H. (2015) The role of complexity metrics in a multi-institutional dosimetry audit of VMAT, *British Journal of Radiology*, 29 October 2015 (Epub ahead of print).

McMULLIN, M.F., HARRISON, C.N., NIERERWEISER, D., DEMUYNUK, H., JAKEL, N., GOPALAKRISHNA, P., McQUITTY, M., STALBOVSKAYA, V., RECHER, C., THEUISSEN, K., GISSLINGER, H., KILADJIAN, J.J., AL-ALI, H.K. (2015) The use of erythropoiesis stimultating agents with ruxolitinib in patients with myelofibrosis in COMFORT-II: an open-label, phase3 study assessing efficacy and safety of ruxolitinib versus best available therapy in the treatment of myelofibrosis, *Experimental Hematology Oncology*, 4, p26.

MILLS, I.G. (2015) Molecular Subtyping of Prostate Cancer: A Partnership Model, *Eur Urol*, 68, p568-569.

MORRISON, P. (2015) Patrick Morrison: An aspiring lumberjack, *BMJ*, 350:h2304.

MUNKLEY, J., OLTEAN, S., VODAK, D., WILSON, B. T., LIVERMORE, K. E., ZHOU, Y., STAR, E., FLOROS, V. I., JOHANNESSEN, B., KNIGHT, B., McCULLAGH, P., McGRATH, J., CRUNDWELL, M., SKOTHEIM, R. I., ROBSON, C. N., LEUNG, H. Y., HARRIES, L. W., RAJAN, P., MILLS, I. G., and ELLIOTT, D. J. (2015). The androgen receptor controls expression of the cancer-associated sTn antigen and cell adhesion through induction of ST6GalNAc1 in prostate cancer, *Oncotarget*, 7 October 2015 (Epub ahead of print).

O'CONNELL, B.F., IRVINE, D.M., COLE, A.J., HANNA, G.G. and McGARRY, C.K. (2015) Optimizing geometric accuracy of four-dimensional CT scans acquired using the wall- and couch-mounted Varian® Real-time Position Management™ camera systems, *British Journal of Radiology*, 88(1046), p20140624.

PASHAYAN, N., DUFFY, S.W., NEAL, D.E., HAMDY, F.C., DONOVAN, J.L., MARTIN, R.M., HARRINGTON, P., BENLLOCH, S., AL OLAMA, A.A., SHAH, M., KOTE-JARAI, Z., EASTON, D.F., EELES, R. and PHAROAH, P.D. for the UKGPCS Collaborators and for the PRACTICAL Consortium (2015) Implications of polygenic risk-stratified screening for prostate cancer on overdiagnosis, *Genet Med.*, 17, p789-795.

PICKARD, A. and MILLS, I.G. (2015) Maintaining a Healthy Balance: Targeting TERT to Stem Benign Prostatic Hyperplasia, *Eur Urol.*, 28 October 2015 (Epub ahead of print)

PRISE, K.M. and MARTIN, S.G. (2015) Editorial – Nanoparticles for Diagnostic Imaging and Radiotherapy, *British Journal of Radiology*, 88(1054), p20150692.

REDMOND, K.L., PAPAFILI, A., LAWLER, M. and VAN SCHAEYBROECK, S. (2015) Overcoming resistance to targeted therapies in cancer, *Semin Oncol* (In Press).

ROONEY, K.P., MCALEESE, J., CROCKETT, C., HARNEY, J., EAKIN, R.L., YOUNG, V.A., DUNN, M.A., JOHNSTON, R.E. and HANNA, G.G. (2015) The Impact of Colleague Peer Review on the Radiotherapy Treatment Planning Process in the Radical Treatment of Lung Cancer, *Clin Oncol (R Coll Radiol).*, 27(9), p514-8.

ROSS-ADAMS, H., LAMB, A.D., DUNNING, M.J., HALIM, S., LINDBERG, J., MASSIE, C.M., EGEVAD, L.A., RUSSELL, R., RAMOS-MONTOYA, A., VOWLER, S.L., SHARMA, N.L., KAY, J., WHITAKER, H., CLARK, J., HURST, R., GNANAPRAGASAM, V.J., SHAH, N.C., WARREN, A.Y., COOPER, C.S., LYNCH, A.G., STARK, R., MILLS, I.G., GRÖNBERG, H., NEAL, D.E. and CamCaP Study Group (2015) Integration of copy number and transcriptomics provides risk stratification in prostate cancer: A discovery and validation cohort study, *EBioMedicine*, 2(9), p1133-44.

SALTO-TELLEZ, M. (2015) Diagnostic Molecular Cytopathology - a further decade of progress, *Cytopathology*, 26(5), p269-70.

SCHNEIDER, D., BIANCHINI, G., HORGAN, D., MICHIELS, S., WITJES, W., PLUN FAVREAU, J. and LAWLER, M. (2015) Establishing the evidence bar for molecular diagnostics in personalised cancer care, *Public Health Genomics* (Special Issue), 18(6), p29-38.

SEVILLA, L. M., LATORRE, V., CARCELLER, E., BOIX, J., VODAK, D., MILLS, I. G., and PEREZ, P. (2015). Glucocorticoid receptor and Klf4 co-regulate anti-inflammatory genes in keratinocytes, *Mol Cell Endocrinol*, 412, p281-289.

THIBAULT, I., CHIANG, A., ERLER, D., YEUNG, L., POON, I., KIM, A., KELLER, B., LOCHRAY, F., JAIN, S., SOLIMAN, H. and CHEUNG, P. (2015). Predictors of Chest Wall Toxicity after Lung Stereotactic Ablative Radiotherapy, *Clinical Oncology*, 27 June 2015.

WANG Y, McMANUS, D.T., ARTHUR, K., JOHNSTON, B.T., KENNEDY, A.J., COLEMAN, H.G., MURRAY, L.J. and HAMILTON, P.W. (2015) Whole Slide Image Cytometry: a Novel Method to Detect Abnormal DNA Content in Barrett's Oesophagus, Nature, *Laboratory Investigation*, 3 August 2015 (Epub ahead of print).

WEN, Q., O'REILLY, P., DUNNE, P.D., LAWLER, M., VAN SCHAEYBROECK, S., SALTO-TELLEZ, M., HAMILTON, P. and ZHANG, S.D. (2015) Connectivity mapping using a combined gene signature from multiple colorectal cancer datasets identified candidate drugs including existing chemotherapies, *BMC Syst Biol.*, 9 Suppl 5:S4.

NEW APPOINTMENTS

Welcome to the following new staff recently appointed to the Centre:

Academic Staff:
Mr Stuart McIntosh

Research Staff:
Dr Francesca Amoroso
Mr Robbie Carson
Mr Pablo de Vera
Dr Jose Fernandez
Miss Laura Kettyle
Dr Katherine McAllister
Miss Leona McGirr
Miss Christine Young

Clinical Academic Training Programme:
Dr Aimee Henry

Technical Staff:
Dr William Andrews
Dr Lara Maria Dura Perez
Miss Leanne McIlreavey
Dr Peter Stewart

Administrative Staff:
Miss Joanne Badger

Visiting Researchers:
Dr Cláudia Cardoso
Mr Giles Carey
Dr Jeremy Hamilton
Mr Finn Harkin
Miss Morgane Mell
Mrs Vivien Prise
Mr Stephen Whitehood

CCRCB EVENTS

2015 CRUK Centre Lecture
10 December 2015
Professor Richard Marais
Director, CRUK Manchester Institute

2016 CCRCB Mitchell Lecture
14 June 2016
Professor Charles Sawyers
Director of the Human Oncology and Pathogenesis Program
Memorial Sloan-Kettering Cancer Centre

EVENTS

IACR 2016 Conference
24–26 February 2016
Kingsley Hotel, Cork
For further information and registration please refer to:
http://www.iacr.ie

AACR 2016 Annual Meeting
16–20 April 2016
Ernest N Morial Convention Center, New Orleans, Louisiana
For further information and registration please refer to:
http://www.aacr.org

ASCO 2016 Annual Meeting
3–7 June 2016
Chicago, Illinois
For further information and registration please refer to:
http://am.asco.org

NEW RESEARCH STUDENTS

Welcome to the following postgraduate students who have commenced their research studies at CCRCB this academic year:

Students:	Supervisors
Lauren Cairns	Prof R Kennedy, Dr R Turkington & Prof T Harrison
Aideen Campbell	Prof P Harkin, Dr K Savage & Mr S McIntosh
Craig Davison	Prof R Wilson & Dr R Ladner
Rosalie Douglas	Prof R Kennedy & Dr R Turkington
Caroline Forde	Prof R Wilson, Dr V Coyle & Prof M Clarke
Gemma Gregg	Prof R Kennedy, Dr S McDade & Dr I Mills
Charlene Junkin	Prof K Prise & Dr K Butterworth
Hajrah Khawaja	Dr S Van Schaeybroeck & Prof T Harrison
Suzanne McPherson	Prof K Mills & Prof MF McMullin
Aideen Roddy	Prof M Salto-Tellez, Dr D McArt & Prof K Prise
Aidan Seeley	Dr D Longley & Dr E Evergren
Lorna Stewart	Prof D Waugh & Dr I Mills
Steven Thompson	Prof R Kennedy & Prof T Robson
Adam Uprichard	Prof R Kennedy & Prof D Waugh

Comments on the CCRCB Bulletin or suggestions for future editions should be forwarded to **katie.stewart@qub.ac.uk**