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CCRCB LAUNCHES CRUK 5-YEAR RESEARCH STRATEGY TO RESEARCH COMMUNITY



Professor David Waugh (CCRCB Director) with Harpal Kumar (CRUK Chief Executive), Professor Peter Johnson (CRUK Chief Clinician), Jo Reynolds (CRUK Director of Centres, Operations and Reporting) and Professor Patrick Johnston (QUB President and Vice-Chancellor) at the launch of Cancer Research UK 5-year research strategy

On 21 May, the CCRCB hosted the launch of the new Cancer Research UK 5-year Research Strategy to the research community. CRUK Chief Executive Harpal Kumar and CRUK Chief Clinician Professor Peter Johnson presented the strategy to over sixty researchers, academics, clinicians and others who attended the event. CRUK Director of Centres, Operations and Reporting Jo Reynolds, then moderated a detailed question and answer session.

CRUK's ambition is to accelerate progress and see three-quarters of patients surviving

their disease within the next twenty years. Harpal outlined the charity's agenda to tackle cancer from all angles, increase investment, promote collaboration across a range of disciplines and pioneer new approaches. The new strategy includes a greater focus on improving patient benefit and the research that will best help achieve this.

Peter Johnson presented several new funding streams and these were outlined for researchers. Funding will be increased for early diagnosis research and research into

cancers of unmet need where progress has been slow (lung, pancreatic, oesophageal, brain) and precision medicine. There will also be increased investment in prevention research. There is an overall increased focus on collaboration, including the involvement of new research areas and international approaches. The event finished with a networking lunch, where everyone had an opportunity to ask further questions and find out more information about CRUK's range of grant opportunities.

CANCER RESEARCH UK CENTRE LECTURE

The Cancer Research UK Centre Lecture took place in CCRCB on 8 May 2014. The lecture was given by Professor Robert Brown from Imperial College, London. The title of Professor Brown's lecture was "Epigenetic drivers of the cancer patient journey through the epigenome landscape."

Professor Brown is Chair in Translational Oncology in the Department of Surgery and Cancer within the Faculty of Medicine at Imperial College, where he heads the Epigenetics Unit and is Head of Division of Cancer. His post is a joint appointment between Imperial College London and Institute of Cancer Research, where he

is Professor of Translational Oncology in the Section of Medicine. Professor Brown is also Principal Investigator of Cancer Research UK research programme, Drug Resistance and Epigenetics, Investigator in the Ovarian Cancer Action Research Centre and co-Principal Investigator CRUK/NIHR Experimental Cancer Medicine Centre.

ANOTHER SUCCESSFUL TEACHERS DAY EVENT



Teachers Day attendees 2014 with CCRCB researchers

AS- and A-Level Biology teachers once again gathered at the CCRCB for the Information Day on Gene Technology sponsored by Cancer Research UK and the CCRCB. Thirty teachers attended the event on 13 June 2014, from a wide range of schools throughout Northern Ireland.

After a welcome from Professor Kevin Prise, the morning session included talks by Professors Patrick Morrison and Mark Lawler. Professor Morrison's talk was titled 'Giants, Kings, Queens and Genes' and was an engaging overview of genetics and the myriad ways it can be used – including paternity testing, catching criminals and establishing Northern Ireland links to long dead famous giant.

Professor Lawler's talk 'Personalised Medicine – Are We There Yet?' gave an insight into genetics in terms of cancer diagnosis and treatment, and how personalised medicine will be the way forward. Using examples of molecular analysis directing new drug development in leukaemia and bowel cancer, Professor Lawler outlined the importance of continuing to develop an understanding of the genetic makeup of cancers in order to provide the translation 'from bench to bedside and back again'.

After lab tours in the CCRCB and lunch, the teachers headed to one of the teaching labs in the MBC for some practical work which was led by Dr Jules Gorski, and supported by 10 researchers from across the CCRCB. The group got

to load a gel and analyze the results. They also participated in two activities that they can take back to the classroom – extracting DNA from a strawberry and making a DNA double helix from jelly babies.

The evaluations of the day were overwhelmingly positive with one attendee saying 'It was a really interesting and useful day. It improved my knowledge, which in turn will impact on my teaching'. Another said 'It was a fantastic day; the scientists at our bench were great and we not only learned a lot but had a great time as well'.

CCRCB RESEARCHERS INSPIRE NEXT GENERATION

Sentinus is the home of STEM (Science, Technology, Engineering & Mathematics) enrichment and enhancement activities for schools in Northern Ireland. Their annual exhibition was held in the Odyssey Arena on 20 June and over 2500 students, both primary and secondary, from across Northern Ireland attended. The event encourages students to take up STEM subjects and many who attended entered their own science projects which were judged at the event.

Throughout the day, about 300 students visited the Cancer Research UK stand and participated in two interactive activities. The stand was manned throughout the day by volunteer CCRCB researchers Jess Niesen, Mark Aurel Fuchs, Maria Rea, Michael Moran, Vicky Bingham and Pamela Maxwell. They helped students to extract DNA from a strawberry and to make a DNA double helix out of jelly babies. They also talked with the students about DNA generally and its importance in cancer research.



Maria Rea, Vicky Bingham, Michael Moran and Pamela Maxwell at Sentinus 2014

QUEEN'S RESEARCHERS HELPING TO MAKE THE 'BIG C' SMALLER

Researchers from CCRCB took part in a free public event entitled 'Cancer Research: Advancing Patient Care', held at Riddel Hall on 11 June 2014. Members of the public were invited to drop-in for a chat with those working in cancer nursing, palliative care, drug discovery and the running of clinical trials, and to hear presentations by four of Queen's top cancer researchers. The event was an opportunity for members of the public to gain an insight into the ground-breaking work of Queen's world-class cancer researchers, and its' impact on cancer patients in Northern Ireland.

Among the speakers was Professor Joe O'Sullivan, who gave a presentation on the development of new radiation treatments for prostate cancer, including a new way to combine radiation therapy and chemotherapy to treat prostate cancer which has spread to the bone. Professor Richard Kennedy also talked about how he has collaborated with Almac Diagnostics to develop new tests to guide oncologists and patients in their choice of chemotherapy treatment, allowing it to be 'tailored' to an individual's specific needs. Professor Tracy Robson from the School of Pharmacy and Dr Anna Gavin from the Northern Ireland Cancer Registry also gave presentations at the event.

Professor David Waugh, Director of Queen's Centre for Cancer Research and Cell Biology, said: "Around 8,600 new cases of cancer are diagnosed each year in Northern Ireland, but thanks to developments in diagnosis and treatment, more people than ever are surviving the disease. There are now at least 50 people walking around Northern



Professor Joe O'Sullivan, Professor Richard Kennedy, Professor Tracy Robson, Dr Anna Gavin, Professor James McElroy and Professor David Waugh

Ireland each year who, less than twenty years ago, would have died. Our cancer survival rates are among the best in the UK and that is due, in no small part, to the work of Queen's cancer researchers."

Queen's Vice-Chancellor, Professor Patrick Johnston said: "People often read and hear in the media about the world-class cancer research that is taking place at Queen's, and this event offers people the opportunity to actually meet and hear more from the people behind the headlines. Queen's is leading on the initiative to create a European Cancer Patients Bill of Rights, launched in the European Parliament on World Cancer Day earlier this year. As part of

the European Cancer Concord we are urging member states to help underpin improved and equal access to cancer care for all European citizens.

"Today's showcase features gifted scientists and clinicians who work with partners across academia, industry and the health service to drive discovery and innovation in cancer care. Their vision and commitment is transforming cancer from a killer disease to a chronic disease. Together, we are helping make the 'big C' smaller, and we will continue to do all that we can to erase it all together."

CCRCB ESTABLISHES NEW ENGAGEMENT COMMITTEE

A new Research Engagement Committee has been established in the CCRCB. Coordinated by Margaret Carr from Cancer Research UK, the committee has four main goals: to create and foster an environment that values engagement, to build research engagement interest and expertise across the Centre, to contribute to the development of a research strategy for the Centre, and to engage a wide range of audiences including

politicians, patients and their families, and health staff.

The committee is already working on several new large-scale public events for Autumn 2014 and Spring 2015 (including participation in Northern Ireland's inaugural Science Festival), and will be organising training for researchers in communicating science to a lay audience this year.

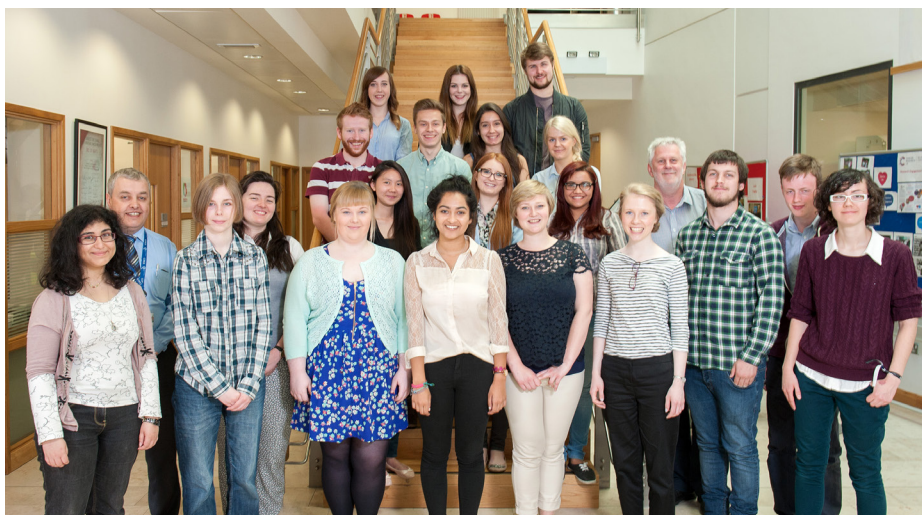
Current committee members are Caroline Crothers, Professor Ken Mills, Dr Sandra Irvine, Pamela Maxwell, Professor Mark Lawler, Jules Gorski, Laura Taggart, Beryl Graham, Bailey Evans, Ruth Boyd, Kirsty McLaughlin, Abdullah Alvi and Phil Burn. Membership of the committee is open to all; if you are interested in participating please contact Margaret Carr from CRUK.

CCRCB SUMMER RESEARCH PROGRAMME 2014

The CCRCB Summer Research Programme started on Monday 30 June 2014 with a welcome from Professor Kevin Prise, Deputy Director, followed by the requisite health and safety briefing before the students met with their supervisors and research teams.

The 2014 cohort of students come from a range of academic backgrounds within the University, including biomedical science, biological science, medicine and dentistry. There are also students from universities in Dundee, Warwick, Cardiff, Cambridge and New York taking part in the programme. Some Brazilian students involved in the "Science without Borders" scheme have added to the international flavour of the summer programme.

This year's projects reflect the full range of research in the CCRCB from haematological malignancies; breast, gastrointestinal and genitourinary cancers; radiation biology, molecular pathology and bioinformatics. The



Professor Kevin Prise and Professor Ken Mills with the CCRCB Summer Students

results from the projects will be displayed in a poster session on 21 August 2014. The students have been funded from a variety of sources including the CCRCB, the School of Medicine, Dentistry and Biomedical Sciences (including

studentships allocated from the Centre of Dental Education and the Centre of Biomedical Science Education), Leukaemia & Lymphoma NI, Almac and the EU Epo-CAN project.

CANCER RESEARCH INFORMATION EVENING



CCRCB researchers Gaurang Patel, Dr Joy Kavanagh and Dr Zenobia D'Costa at the Cancer Research Information Evening

More than 40 people attended a Cancer Research Information Evening in the Centre for Cancer Research and Cell Biology (CCRCB) on Thursday 3 April 2014. Organised by Queen's Development and Alumni Relations Office, it was an opportunity to thank current donors to the University's cancer research programmes, to highlight some of the ongoing research successes at CCRCB and to acknowledge the impact of philanthropic gifts.

Northern Ireland's cancer survival rates are currently among the best in the UK. This is due to a Comprehensive Cancer Care and Research Programme – a partnership between Queen's and local Health and Social Care Trusts. Improving

outcomes for patients lies at the heart of the work of the Centre and staff there are aiming to speed up the process of taking new lab discoveries through to the clinical setting.

Introduced by Professor David Waugh (CCRCB Director), the event included talks from doctors and researchers working in breast, ovarian and prostate cancers, radiotherapy and clinical trials. Following the presentations, guests were taken on a guided tour of the state-of-the-art facilities in the Centre. Feedback from the evening was very positive with one guest commenting: 'Thank you for a friendly, informative and welcoming evening. The tour of the labs was excellent!'

DISTINGUISHED VISITOR LECTURE SERIES

We were delighted to welcome Dr Mark Saunders from the Christie Hospital in Manchester to the Centre recently. The visit was kindly sponsored by Dr Jimmy Sloan, an alumnus of the School of Medicine, Dentistry and Biomedical Sciences, as part of the Distinguished Visitor Lecture Series.

Dr Saunders delivered his lecture entitled "Novel treatments for rectal cancer – the DREAM therapy study" on Thursday 5 June 2014.



Dr Mark Saunders, Alice O'Rawe (Queen's Foundation), Dr Sandra Van Schaeybroeck and Dr Jimmy Sloan

LORD MAYOR CELEBRATES 50 YEARS OF LEUKAEMIA & LYMPHOMA NI



Belfast City Lord Mayor Mairtín Ó Muilleoir with Professor Ken Mills (CCRCB) and PhD students Gemma Logan and Kathryn Clarke

On Wednesday 9 April 2014 Belfast City Lord Mayor Mairtín Ó Muilleoir visited CCRCB to unveil a plaque marking the 50th anniversary of local research charity Leukaemia & Lymphoma NI. The 50 year old charity, formerly known as the Northern Ireland Leukaemia Research Fund, recently underwent a major rebrand and the charity wanted to acknowledge the work of its supporters by unveiling a glass plaque and hosting a coffee morning at the CCRCB.

Commenting at the launch, Lord Mayor Mairtín Ó Muilleoir said: "It is with great pleasure I unveil this beautiful glass plaque to mark Leukaemia & Lymphoma NI's 50th anniversary of scientific research into leukaemia and associated blood cancers. The haematology research laboratories within the Centre for Cancer Research and Cell Biology (CCRCB) are doing sterling research work and contributing greatly to the fight against

cancer. I congratulate those hard-working researchers and also the dedicated volunteers whose support has allowed the charity to reach this landmark anniversary. I wish them luck for the next 50 years."

Professor Ken Mills, Chair of Experimental Haematology, said: "This plaque marks the hard work that has gone into leukaemia and lymphoma research in Northern Ireland which is greatly appreciated by the CCRCB. The plaque is testament to all those working to enhance scientific research into leukaemia and associated blood cancers. It is also testament to those volunteers who have supported the charity in the past 50 years and for that support we are grateful.

"Our research into leukaemia, lymphoma and myeloma is internationally renowned and our world class insights need to be

supported and encouraged. The research we carry out seeks to understand how leukaemia and other related diseases develop. From this important work we can discover better ways of treating these diseases and ultimately improve the outcome and quality of life for patients.

"Leukaemia and Lymphoma NI recently rebranded in order to reinvigorate it and allow it to continue its fundraising and research efforts so it is quite timely that we unveil this plaque as a symbol of its commitment to the fight against blood cancers".

Mr Bill Pollock, Chair of Leukaemia & Lymphoma NI, said: "The unveiling of this plaque is a symbol of a new and exciting era for Leukaemia & Lymphoma NI and marks the dedication and commitment by our scientific researchers and supporters over the last 50 years. We've recently made a £1.5 million three year investment which will enable researchers and clinicians in Queen's University Belfast and across Northern Ireland to continue and expand their internationally recognised research.

"The number of lives and loved ones that have been saved through the donations raised and spent here on scientific research is significant, and with our new vision for the charity we are confident that we will be able to continue advancing the fight against blood cancers for many years to come. We would like to say thank you to our supporters for all of the hard work and fundraising that has enabled Leukaemia & Lymphoma NI to reach its 50th anniversary."

HOSPITALAR CONFERENCE BRAZIL

On 21 May 2014 Professor Richard Kennedy was invited to present the CCRCB Personalized Medicine Research Programme at the Hospitalar Conference, Brazil. This is the biggest medical conference in South America with approximately 91,000 delegates this year. The theme was the role of academic, NHS and industrial partnerships in order to deliver cost effective therapies in the clinic. He shared the stage with Sir David Nicholson, ex-chief executive of the NHS, who presented how research

into personalized medicine could impact patient care in the UK.

Professor Kennedy focused on Belfast's success in bringing basic research to the clinic through the partnership between the NHS, QUB and Almac supported by Invest Northern Ireland. He gave examples of research that had originated at QUB, such as the Colon Cancer ColDx prognostic assay and the DDRD chemotherapy predictive test that are both entering clinical practice within the

next 18 months and the anti-angiogenic ALM201 drug, that will undergo a clinical study in ovarian cancer this year. He explained how close collaboration between basic scientists, clinicians and industry in Northern Ireland has rapidly accelerated the discovery and development of personalized cancer therapies. The question and answer session was around how similar schemes could be implemented in other countries such as Brazil, resulting in several potential new collaborations for CCRCB.

CCRCB SCIENTISTS' EFFORT TO BEAT BLOOD CANCER RECEIVES FUNDING BOOST

Scientists at the Centre for Cancer Research and Cell Biology (CCRCB) have been awarded a £126,000 grant by blood cancer charity Leukaemia & Lymphoma Research for research to improve treatments for blood cancer patients.

The two year research project will be led by Professor Ken Mills, Dr Kieran Savage, Professor Mary Frances McMullin and Dr Fabio Liberante. They will develop new treatments that are more effective at seeking out and destroying abnormal white blood cells.

The research will focus on a genetic fault found in patients with myelodysplastic syndrome (MDS). MDS is a group of blood disorders where the balance of healthy blood cells in the body is disrupted by the growth of 'master' cells.

Patients with these types of disease are usually elderly and are often unable to cope with intensive treatment like chemotherapy.

Professor Mills said: "Several genetic abnormalities have been connected with MDS but we don't know their role in the onset or progression of the disease. In particular a gene called SF3B1 is known to be mutated in the blood cells of around a third of patients with MDS. As many as 85% of patients with a type of MDS called refractory anaemia with ring sideroblasts (RARS) have the error. The ultimate aim of our research is to improve treatment for patients with MDS, particularly RARS, by identifying a specific drug that can target this SF3B1 mutation."

The researchers will study this particular genetic fault and use cutting-edge

genetic techniques to identify exactly how the mutated SF3B1 gene influences the development of MDS. They will look at how the abnormal SF3B1 affects the ability of the cell to repair damaged DNA, how this impairment influences disease progression, and whether it's possible to block it with drugs.

Dr Matt Kaiser, Head of Research at Leukaemia & Lymphoma Research, said: "The majority of patients diagnosed with MDS are over the age of 60 and most are unable to cope with the current treatments available. This research shed light on how a genetic error in SF3B1 affects blood cell development and behaviour. Improving treatments and tailoring them to target specific rogue cells will enable a safer and more effective way of combating the disease for patients."

QUEEN'S PROFESSOR HIGHLIGHTS THE HEALTH ECONOMIC ARGUMENT FOR INVESTING IN CANCER CARE



Professor Mark Lawler

Professor Mark Lawler, Chair in Translational Cancer Genomics, Centre for Cancer Research and Cell Biology, Queen's University Belfast, delivered a keynote invited speech at the recent Greek EU Presidency event "Shaping the Future of Healthcare in Greece; Shaping a Healthier Nation; shaping a healthier Europe" in Athens. The Conference was hosted in association with the Financial Times and was opened by the Greek Minister for Health, Spyridon-Adonis Georgiadis. Addressing the 560 delegates at the conference in his speech entitled "Shaping improved outcomes for Europe's citizens in an era of economic austerity: The European Cancer Patient's Bill of Rights, a catalyst for change", Professor Lawler highlighted how appropriate

investment in cancer care and research can not only improve cancer outcomes but can also contribute to socio-economic benefit for Europe's citizens and societies.

"It is over 2,000 years since the Roman poet Virgil coined the phrase *The Greatest Wealth is Health*, said Professor Lawler. "Sadly, inequalities in access to cancer care and escalating costs are eroding this noble maxim. The economic burden of cancer in Europe is now approaching €150 Billion annually. However, over 60% of this "cost" is due to loss of productive life years for cancer patients. We want to rekindle a "Wealth is Health" agenda, that will not only improve the wellbeing of the European cancer patient but

will also contribute to increased innovation and improved productivity, driving economic growth and reducing pressure on future health and social welfare systems".

Since the signing of the European Cancer Patient's Bill of Rights at the European Parliament on World Cancer Day, 4 February 2014, there has been significant interest around Europe in how the Bill of Rights can effect change at national level. "In Greece there are many issues that need to be addressed, said Kathi Apostolidis, prominent patient advocate and Vice President of the European Cancer Patient Coalition. "We look forward to working together with the European Cancer Concord to make a real difference for Greek cancer patients", she added.

"Here in the North of Ireland, we also need to engage with the European Cancer Patient's Bill of Rights", said Maeve McLaughlan MLA, Chair of the Northern Ireland Assembly Health Committee. "The health economic argument is an important one, underpinning the basis for providing better care for our cancer patients and enhancing our society", she added.

A recording of Professor Lawler's speech can be viewed at www.livemedia.gr/video/68042

LAUNCH OF NEW CAMPAIGN CALLING FOR EQUAL ACCESS TO CANCER DRUGS



Roisin Foster (Chief Executive, Cancer Focus NI) with Professor Mark Lawler at the launch

Leading cancer charity Cancer Focus Northern Ireland is calling on the public to pledge their support for Equal Access to cancer drugs for patients in Northern Ireland in a new campaign.

Cancer Focus NI launched the three month campaign with the support of 14 local charities. The charity aims to net 10,000 pledges of support via email, letters and postcards, which will be delivered to Health Minister Edwin Poots at Stormont this autumn. There are currently 38 cancer drugs available to patients in England that are not readily available to patients in Northern Ireland. Anyone who would like to pledge their support for equality of access for local patients should visit www.equalaccessni.org.

Cancer Focus NI has been a driving force in the campaign to overhaul the current system to fund life-extending cancer medicines here. Chief Executive, Roisin Foster, said: "Cancer Focus NI has been concerned for some time that local cancer

patients are being denied access to life-extending drugs that are currently available in England and Scotland, and will soon be available in Wales. The purpose of this campaign is to ensure that the most effective drugs will be made available to local cancer patients in their time of need.

"The Health Minister has indicated that he will hold a review of the cancer drug approval process in Northern Ireland, which is a move in the right direction. However, patients do not want an open ended review - they want decisive action to improve access to drugs that could extend their lives, improve their quality of life and ease symptoms.

"There is much work to be done and politicians, patients groups, clinicians and drug companies will need to work together to get the best outcome for cancer patients. We hope a strong vote will persuade our politicians to act sooner rather than later."

NEW GENE EXPRESSION BIOMARKER TEST DISCOVERED

CCRCB Professors Richard Kennedy and Paul Harkin, in collaboration with Professor Charlie Gourley in Edinburgh University and Almac Diagnostics, have discovered a novel biomarker to help guide the treatment of high-grade serous ovarian cancer (HGSOC) and avoid harm by inappropriate use of anti-angiogenic drugs. The associated study, on which Richard Kennedy was the senior author, was selected for an oral presentation at the American Society of Clinical Oncology (ASCO) 2014 annual meeting. The organizing committee also awarded the study "Best of ASCO".

The AADx biomarker predicts which patients with HGSOC are likely to benefit from standard chemotherapy and identifies those who potentially come to harm through the addition of antiangiogenic drugs such as Avastin (bevacizumab). The project started in 2009 with the transcriptional analysis of a group of 200-plus Scottish patients to identify the major molecular subtypes. The team identified 3 subtypes among these HGSOC patients. Two had angiogenic gene upregulation, which means that they had high expression of genes involved in vascular development during angiogenesis. They were combined to make the "proangiogenic" subgroup. The subgroup with no angiogenesis was characterized by up-regulation of immune genes and

was labeled the "immune" subgroup. A 63-gene expression biomarker was developed to prospectively identify the immune subgroup, which had the better survival. The test was subsequently validated as a good prognostic biomarker for overall survival following standard chemotherapy in an independent validation dataset (HR = 0.32 [0.19 - 0.54]).

Next, the team hypothesized that the immune response subgroup, which had no angiogenesis-related gene expression, would benefit less from the anti-angiogenic drug Avastin. In collaboration with the MRC clinical trials unit, they applied the biomarker to 285 HGSOC translational research samples from the ICON7 study. This was an international phase III study in which ovarian cancer patients received standard carboplatin and paclitaxel chemotherapy or standard chemotherapy plus Avastin. In this dataset, the gene signature showed a difference in impact of Avastin on progression-free survival between the immune response and "proangiogenic" (upregulation) subgroups ($P = .016$). For the immune subgroup (41% of cases), the addition of Avastin conferred a worse progression free survival (HR = 1.73) and overall survival (HR = 2.00) compared with chemotherapy alone. Importantly, Avastin halved the median progression free survival from 36 down to 18 months

in the immune subgroup, the group that did well with standard chemotherapy treatment.

"The immune signature identified patients whose outcome was adversely affected by Avastin, and there was a trend toward improved outcomes with Avastin outside of this subtype. This is the first assay to convincingly predict sensitivity to anti-angiogenic therapy in any cancer," Professor Gourley said at the ASCO presentation.

Speaking at a 'Highlights of the Day' Session at ASCO, Rebecca Kristeleit, MD, PhD, medical oncologist at University College of London Cancer Institute, said: "This is a very exciting study because it is the first time that researchers have managed to identify subgroups that will not respond to Avastin. Patients with the immune gene signature could likely be spared the costs and possible side effects of Avastin treatment. This is a powerful tool to help us refine treatment."

Richard Kennedy and Paul Harkin, along with their colleagues in Almac Diagnostics, presented the assay to the FDA in Washington in May, and are now in the process of bringing it into the clinic early next year.

QUEEN'S UNIVERSITY DISCOVERY SIGNALS NEW TREATMENT FOR WOMEN AT HIGH RISK OF BREAST AND OVARIAN CANCER

Cancer researchers at Queen's University Belfast have made a breakthrough which could signal new treatments for women at high risk of breast and ovarian cancer. Currently around one in 1,000 women in the UK carry what is known as a BRCA1 mutation - the same condition that prompted well-known actress Angelina Jolie to undergo a double mastectomy. They have up to an 85 per cent risk of developing breast cancer, and up to 40 per cent risk of developing ovarian cancer, in their lifetimes. Until now, preventive surgery - mastectomy (breasts) and oophorectomy (ovaries) - has been the only way of reducing the risk of developing both types of cancers.

The new discovery by researchers in Queen's Centre for Cancer Research and Cell Biology (CCRCB) may mean women affected with BRCA1 could use drugs, which are already available, to reduce their risk of developing the disease, rather than undergo irreversible surgery. In turn, such treatments would open up the possibility of some of these women, who might otherwise have an oophorectomy, still being able to have children. This research by Dr Kieran Savage, Dr Kyle Matchett and Professor Paul Harkin at CCRCB proves there is a direct link between high levels of oestrogen and DNA damage, which causes cancer, in the breasts and ovaries.

Specifically, the scientists discovered that the cells of women with the BRCA1 mutation cannot effectively fight the very high levels of oestrogen that exist in all women's breasts and ovaries, leaving them vulnerable to DNA damage. While this link between oestrogen, breast/ovarian cancer and BRCA1 mutation has been suspected by the scientific community for years, it has not been proven until now.

Dr Kieran Savage, from the CCRCB said: "This discovery is very significant in the management of women with the BRCA1 gene mutation. It's the first really credible evidence that oestrogen is driving cancer in women with a BRCA1 gene mutation. Because of this discovery, we now have the opportunity to propose an alternative treatment to surgery. It also opens up the possibility of pausing treatment for a period in order for women to have children, if desired. What also makes this exciting is that there are drugs already on the market which turn off oestrogen production. In theory, we could use these drugs to chemically reduce oestrogen production in women which could negate the need for irreversible surgery."

The Queen's-led research, which has been ongoing for four years, was carried out with funding from Cancer Focus NI and Cancer Research UK and

is published in the latest edition of the prestigious USA-based journal *Cancer Research*.

Professor David Waugh, Director of the Centre for Cancer Research and Cell Biology at Queen's, said: "This breakthrough by researchers at CCRCB is great news for women with the BRCA1 gene and the cancer research community as a whole. It is pivotal in that it reveals more about the mechanisms behind breast and ovarian cancer."

Roisin Foster, Chief Executive, Cancer Focus Northern Ireland, said: "Cancer Focus is delighted to fund this groundbreaking research into breast cancer, which has the potential in the foreseeable future to benefit women all over the world. We are only able to support this vital work because of the generosity of our local community."

The researchers are currently seeking funding to launch clinical trials and hope to do so within 12 months. It is envisaged that, in the first instance, a small control trial will be carried out using a combination of two drugs on 12 women for a period of three months, using biopsy, blood and urine samples to track DNA damage.

ManAlive CONFERENCE 2014



Gerry McIlwee (Cancer Focus NI), Professor Mark Lawler (CCRCB) and Sandra Gordon (Cancer Focus NI) at Cancer Focus NI's annual ManAlive conference

The Cancer Focus Northern Ireland annual ManAlive conference this year focused on the best ways to communicate with men about cancer prevention, the importance of early diagnosis and treatment, and where to find support.

The conference was held at the Dunsilly Hotel, Antrim, to mark Men's Health Week, which ran from 9 – 15 June 2014, and to update healthcare professional and individuals with an interest in men's health and cancer issues. More than 100 delegates attended including the voluntary, community and private sectors as well as local councils and the five health trusts.

Professor Mark Lawler from CCRCB spoke to delegates on the theme 'Manning up to cancer – male empowerment to overcome cancer inequalities'. He said: "Inequality in access to cancer care is a significant

problem. The European Cancer Concord, led from Belfast, launched the European Cancer Patient's Bill of Rights in the European Parliament on World Cancer Day earlier this year. This Bill of Rights has all party support from our three MEPs and is a catalyst for change, allowing cancer patients to address the significant inequalities that they experience every day. Health is not a luxury, health is a right. In this Men's Health month, we focus on the particular challenges that male cancer patients and their families face and investigate potential solutions that may improve outcomes for men with cancer."

Other speakers included author/broadcaster Christy Kenneally, Professor Gerard Hastings (University of Sterling), Dr Karen Doherty (Cancer Focus NI counsellor), Dr Una Lynch (Sonrisa Solutions), and Geraldine Campbell (Big Lottery Fund).

PHOTO GALLERY



Dr John Price and Professor Richard Kennedy receive a donation of £34,382.62 towards ovarian cancer research from Richard Gray and Barry Brewster. The donation was made in memory of Barry's wife Denise Brewster.



Iris McAllister, Margaret Falloon and friends visited CCRCB to present a donation of £650 towards prostate cancer research taking place in the Centre. The donation was raised by the Kilmore Line Dancers and was gratefully received by Professor Joe O'Sullivan and Dr Suneil Jain.



On the evening of Friday 20 June 2014 over 40 people, including 12 CCRCB researchers, took part in the Slieve Donard Moonlit Trek to raise funds for Leukaemia & Lymphoma NI. The charity would like to thank everyone who took part! For further details about Leukaemia & Lymphoma NI see: www.leukaemiaandlymphomani.org

PRIZES AND MEASURES OF ESTEEM

Congratulations to **Dr Richard Turkington**, who received an ASCO Merit Award at the American Society of Clinical Oncology conference in Chicago on 30 May – 3 June 2014. This is the first time that the award has been given to a trainee from Belfast. Richard's abstract was entitled 'Association of a DNA Damage Response Deficiency (DDR2) assay and prognosis in early stage Oesophageal Adenocarcinoma.'

Congratulations to **Mihaela Ghita** who was awarded a highly competitive fellowship to attend the NASA Space

Radiation Research School being held at the Brookhaven National Laboratory, USA.

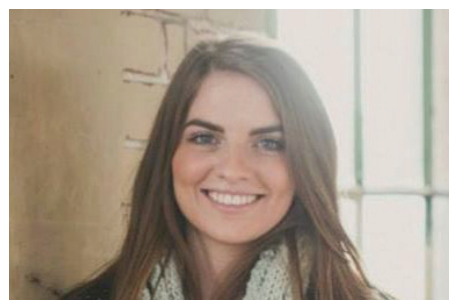
Congratulations to **Thomas Marshall** who has been awarded a US Radiation Research Society Scholars-in-Training award and an Emily Montgomery Fellowship to attend the 60th Annual Meeting of the Society being held in Las Vegas in September.

Congratulations to **Dr Karl Butterworth** who has been elected to the committee of the UK Association for Radiation Research.

Congratulations to **Dr Wendy Hylands**, whose recent paper "Investigation into the radiobiological consequences of pre-treatment verification imaging with megavoltage X-rays in radiotherapy" published in the British Journal of Radiology has been included in a "Best of BJR" Issue.

Dr Frank Emmert-Streib has been appointed as an external member of the dissertation committee for Margaret Bray at the Laney Graduate School, Emory University, Atlanta, Georgia.

FORMER CCRCB SUMMER STUDENT WINS PRESTIGIOUS PRIZE



Rebekah Eves

Rebekah Eves, a 4th year dental student, won the Hatton Prize at the International Association for Dental Research, which was held during 23-28 June 2014 in Cape Town, South Africa. The prize is the highest honour bestowed for undergraduate dental research and is a great achievement for Rebekah, who carried out her research as part of the summer studentship program in CCRCB

in 2013. Rebekah carried out her research under the supervision of Dr Adam Pickard in Professor Dennis McCance's laboratory with help from Dr Jackie James, and was working on the role of myofibroblasts on invasion of oro-pharyngeal cancers. The work showed how myofibroblasts develop from tissue fibroblasts and showed a potential role in predicting early recurrence of disease.

RECENT GRANTS AWARDED

Investigator(s)	Sponsor	Title	Amount	Start Date	End Date
Cardwell, Chris*, Zhang, Shu-Dong*, Murray, Liam Mills, Ken Liberante, Fabio (*Joint Leads, CPH & CCRCB)	Cancer Research UK	A novel, integrated, bioinformatics and pharmacoepidemiology approach to identifying and testing medications with potential breast cancer carcinogenicity, or anti-cancer properties	£194,051	01/10/14	30/09/17
Jain, Suneil O'Sullivan, Joe Prise, Kevin Waugh, David	HSC R&D	Movember CoE Award	£500,000	01/07/14	30/06/19
Longley, Dan Waugh, David	Astex Therapeutics Ltd	Rational targeting of inhibitor of apoptosis proteins (IAPs) for effective treatment of pro-inflamma	£53,391	01/01/15	30/06/15
McDade, Simon Johnston, Patrick Longley, Dan	QUB Foundation	Eamon Murphy Scholarship: 'Exploiting TP53 status to rationally design therapies to selectively target colon cancer cells'	£68,000	01/10/14	30/09/17
Mullan, Paul McDade, Simon	Darren Clarke Foundation	Heather Clarke PhD Scholarship: 'Characterisation of the oncogenic roles of p53 mutations in the pathogenesis of basal-like breast cancers'	£80,000	01/10/14	30/09/17

5500 NI WOMEN 'RACE FOR LIFE'



Phil Burn and Keara Redmond didn't let a bit of rain bother them at Race for Life!

Over 5500 women took part in Cancer Research UK's largest fundraiser in Northern Ireland – Race for Life – at Stormont Estate on 1 June 2014. In order to accommodate the large number of women who registered, two 5K races were held, one in the morning and one in the afternoon. Cool FM dj Sonya Mac was the emcee for the day's events and although there was a bit of rain mid-day, it didn't dampen spirits at all. Dr Keara Redmond, PhD student Phil Burn and CRUK Senior Research Nurse Ruth Boyd helped out on the day by cheering on all the participants and handing out medals (along with their thanks) to runners as they completed the course. Estimates are that the Belfast Race for Life event will raise over £330,000.

RECENT PUBLICATIONS

- AGNEW, A., AGNEW, C.E., GRATTAN, M.W., HOUNSELL, A.R. and McGARRY, C.K. (2014) Monitoring daily MLC positional errors using trajectory log files and EPID measurements for IMRT and VMAT deliveries, *Physics in Medicine and Biology*, 59(9):N49-63.
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NEW APPOINTMENTS

Welcome to the following new staff who have recently joined the Centre:

Academic Staff:

Dr Karl Butterworth
Dr Richard Turkington

Clinical Research Fellows:

Dr Philip Turner

Research Staff:

Dr Elias Arkoudis
Dr Gerald Li
Dr Jessica Neisen
Dr Paul O'Reilly
Dr Sharon Parkinson
Dr Ewelina Rozycka
Dr Shailesh Tripathi

Visiting Researchers:

Professor Richard Bayliss
Miss Aishling Henderson
Dr Paul Kelly
Miss Lisa McCrellis
Dr Ciara O'Flanagan

EVENTS

Irish Radiation Research Society (IRRS)

5 – 6 September 2014

Queen's University Belfast

http://www.irrs.eu/Meeting_2014.html

15th International Meeting on Human Genome Variation and Complex Genome Analysis (HGV 2014)

17 – 19 September 2014

Culloden Estate and Spa, Belfast

For further information and registration please refer to:

<http://hgvmeeeting.org/>

GTC Protein Expression, Purification and Characterisation

23 – 24 October 2014

Boston, MA

For further information and registration please refer to:

<http://www.gtcbio.com/conferences/pd-overview>

10th NCRI Cancer Conference

2 – 5 November 2014

BT Convention Centre, Liverpool

For further information and registration please refer to:

<http://conference.ncri.org.uk/>

All Ireland Cancer Consortium Conference

10 – 13 May 2015

Riddel Hall, Queen's University Belfast

For further information and registration please refer to:

<http://www.qub.ac.uk/AICC2015>

CCRCB EVENTS

Summer School in Computational Biology

8 – 10 September 2014

Health Sciences Building

For further information and registration please refer to:

<http://www.bio-complexity.com/QUBsscb14/Home.html>

Inaugural Lecture – Professor David Waugh

25 September 2014 at 4.00 pm

“Life and Disease...the Importance of Context”

QUB-Vanderbilt Joint Molecular Cancer Epidemiology Symposium

1 October 2014

Riddel Hall, Queen's University Belfast

For further information and registration please contact:

h.coleman@qub.ac.uk

2015 CCRCB Mitchell Lecture

5 March 2015

Professor Lisa Coussens

Knight Cancer Institute, Oregon Health and Science University

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



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