Introduction by Rob Tulloh and Gianni Angelini

The past few months have been quite eventful for Bristol CardioVascular. As many of you are aware, on 13 December 2016 the University announced the formation of seven Specialist Research Institutes (SRIs) following a competitive application process. Under the University’s new strategy plan, an SRI represents a field in which Bristol is acknowledged to be a world leader and where there is significant alignment with regional, national and international ambitions. The SRI will complement existing disciplinary strengths in Schools and Faculties and will be sufficiently limited in number to have an effective role in institutional branding.

The seven Institutes include:

- **Bristol BioDesign Institute** (Dir: Dek Woolfson)
- **Bristol Heart Institute** (Dir: Gianni Angelini)
- **Bristol Composites Institute** (Dir: Michael Wisnom)
- **Bristol Migration and Mobility Institute** (Dirs: Chris Bertram & Julia O’Connell Davidson)
- **Bristol Population Health Science Institute** (Dir: Caroline Relton)
- **Bristol Poverty Institute** (Dir: Dave Gordon)
- **Bristol Quantum Information Institute** (Dir: Noah Linden)

An external launch of the SRIs is anticipated in March 2017.

From 2017 University Research Themes will cease to be formally endorsed and presented at an institutional level. This means that BCV will cease to function in its current state and will be absorbed into the newly formed Bristol Heart Institute. The BCV steering group met for the last time on 14 December 2016.

Meetings are taking place with various stakeholders across the University to finalise the terms of reference for the SRIs and ensure that appropriate support is in place. Changes will therefore be taking place, but every effort will be made to ensure the transition from BCV to an SRI is as smooth as possible. To ease the process it was agreed on 23 February 2017 that the interim SRI steering group will comprise the former members of the BCV steering group. The Director, Prof Gianni Angelini, will be supported by Prof Alastair Poole as Deputy Director (who is also FRD for biomedical Sciences).

In the coming weeks and months, therefore, some metamorphosis will occur (website, newsletters, mailings) but this should not adversely affect the cardiovascular community in any way.

So, in this final BCV Newsletter (at least in this format and under the BCV banner), we would like to take the opportunity to thank you all for your past, past and future support and engagement. BCV has played a significant role in bringing the research community together from across the University and the BRI, and as such we should be justly proud of recent achievements, including a successful BHF PhD Programme, BHF Chair renewals, and the MRC Biomedical Research Centre award.

We very much look forward to highlighting the many successful activities of the community to a wider audience, and forging on to the next level in terms of cardiovascular cohesion and strategy in the coming years.

Rob Tulloh, outgoing BCV Chair

Gianni Angelini, incoming Director of the Bristol Heart Institute
**ERC10 @ UoB**
13 March 2017, 15.00 - 17.00. Reception Room, Wills Memorial Building

**Red cells from Stem cells**
14 March 2017, 13.00 - 14.00. Dr David Anstee (NHS Blood and Transplant), Lecture Theatre C42, Biomedical Sciences Building

**The sinus node in sickness and in health**
27 March 2017, 13.00 - 14.00. Halina Dobrzynski (Institute of Cardiovascular Sciences, University of Manchester), Lecture Theatre C42, Biomedical Sciences Building

**Prof Peter McCulloch, Surgical Sciences & Practice, University of Oxford**
30 March 2017, 12.30 - 13.30. Prof Peter McCulloch (Surgical Sciences & Practice, University of Oxford), OS6 Oakfield House

**HerStories: Career seminar series - Getting Your Voice Heard**
3 May 2017, 13.00 - 14.00. Prof Havi Carel (Philosophy), Old Council Chamber, Wills Memorial Building

**Biotechnology Showcase**
3 May 2017, 13.00 - 20.00, Amsterdam

**Research without Borders: A festival of postgraduate research**
8 May 2017, 10.30 AM - 12 May 2017, 5.00 PM

**Prof Richard Coward, Children’s Renal Unit, Bristol Royal Hospital for Children**
18 May 2017, 16.00 - 17.00. Seminar Room, Second Floor, Oakfield House

**Skeletal systems mechanobiology and personalized medicine**
23 May 2017, 13.00 - 14.00. Prof Ralph Müller (ETH Zürich), Seminar rooms A&B, Level 1 Learning & Research, Southmead Hospital

**How to prepare a good research bid (Medical Faculties)**
8 June 2017, 10.00 - 16.30. Dr Pamela Johnstone, Brunel Room, The Hawthorns

**Bristol Population Health Science Institute launch**
9 June 2017, 9.30 - 16.30. Prof Nancy Krieger (Professor of Social Epidemiology, Department of Social and Behavioral Sciences, Harvard University), Arnolfini Contemporary Arts Centre

A FULL AND UP-TO-DATE EVENTS LISTING IS AVAILABLE ONLINE
**H2020 €28.9M initiative into diabetic kidney disease**

Prof Richard Coward will be leading the BEAt-DKD (Biomarker Enterprise to Attack Diabetic Kidney Disease) project, part of a major pan-European €28.9 million initiative, which will explore the molecular mechanisms underpinning DKD. The project will allow the teams in the School of Clinical Sciences, led by Prof Coward together with Prof Moin Saleem and Dr Simon Satchell, to work closely together on this issue. The Bristol element of the project comes to £396,825.

BEAt-DKD is a unique five-year public private partnership funded by the Innovative Medicines Initiative (IMI), member companies from the European Federation of Pharmaceutical Industries and Associations (EFPIA), the Juvenile Diabetes Research Foundation (JDRF) and the state of Switzerland. At the moment, there are no means to effectively prevent or cure DKD, which has reached epidemic dimensions and is the leading cause of end-stage renal disease. DKD patients are a very sick population with mortalities exceeding most cancers and who are underserved by inefficient and unsuccessful drug development. DKD remains a large unmet medical need.

More info...

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**PKCβII to improve diabetic peripheral ischemia**

Diabetes is the major cause of amputation of lower extremities due to damage of arteries and capillaries which leads to poor tissue nutrition. Current therapies are inadequate as they only alleviate the symptoms but do not promote full tissue healing.

A BHF Project Grant awarded to Prof Paolo Madeddu for £186,790 will support a project into **Targeting of protein kinase C beta II (PKCβII) to improve vascular and muscular fitness in diabetic peripheral ischemia**.

The research team propose to test a new pharmacological association to improve the function of resident vascular cells, thereby helping limb muscles to grow new arteries. The grant will allow Prof Madeddu to investigate if Ruboxistaurin, a new drug that reduces oxidative stress and inflammation, improves the formation of new arteries in diabetic mice with blocked circulation to lower limbs. If successful this project will have a remarkable translational impact and a potential to reduce health and social care cost and loss of productivity due to cardiovascular complications.
David Telling Charitable Trust awards

Dr Giovanni Biglino and Prof Massimo Caputo (pictured left) have received a £22,893 award for Clinical use of 3D printing technology for patients with congenital heart disease.

The David Telling Charitable Trust is supporting research in using 3D printing technology in the context of congenital heart disease through an equipment grant. 3D printing technology allows to replicate complex congenital cardiovascular anomalies and such models could play beneficial role in practicing procedures, training medical staff as well as communicating with patients and families.

Dr Catherine Pennington (photo on left) was recently awarded a David Telling pilot grant that will serve to bring together a new multidisciplinary group involving multiple specialities, including Renal (Drs Fergus Caskey, Albert Power), Ophthalmology (Dr Denize Atan), Urology (Prof Marcus Drake), Stroke (Dr Phil Clatworthy) and Clinical (Pennington, Hughes) and Preclinical Neurosciences (Prof Pat Kehoe) to test the feasibility of study to investigate the impact of advancing Kidney disease and outcomes on the development of complex outcomes including cognitive Impairment, bladder function and pathology of the eye.

Guidelines for Vascular Cognitive Impairment

Guidelines have been developed that should help progress research into vascular cognitive impairment (VCI). Led by UoB, the team brought together over 150 researchers in 27 countries. VCI, which refers to a decline in mental abilities caused by problems with the blood supply to the brain, is the second most common cause of dementia and gradual memory loss after Alzheimer’s disease. Like Alzheimer’s it does not have a cure, and together both conditions contribute to the largest cause of death in England and Wales.

Project lead Prof Pat Kehoe (shown left) invited researchers from around the world to participate in the Vascular Impairment of Cognition Classification Consensus Study (VICCCS), funded by the Alzheimer’s Society. The consortium published their findings on what was agreed as a revised conceptual model of VCI and what should be considered to be its various subtypes. This new concept has built upon some key elements from sets of criteria that have been previously proposed but adopted to varying degrees. This lack of widespread adoption of any single criteria before now has proved to be a major stumbling block towards any progress in VCI research.

Pat’s work has been featured in the Daily Telegraph, BBC Radio Bristol and New York University Radio.

More Info...
BHF PhD Programme success

The British Heart Foundation (BHF) four-year PhD programme in Integrative Cardiovascular Science will address the need to train the next generation of cardiovascular research leaders skilled in bridging research interfaces to produce significant impact for patient benefit and population health. The bid was led by Prof Alastair Poole.

Training will involve the integration of epidemiological, clinical, biological and translational expertise across the University and the NHS to address the important challenges of cardiovascular disease. Bristol’s existing resources and expertise, including a world-leading academic cardiac surgery unit, an NIHR BRU in cardiovascular medicine, the MRC Integrative Epidemiology Unit, ALSPAC and other large cohort resources, the Wolfson Biimaging Facility, the Translational Biomedical Research Centre and the Clinical Research Imaging Centre will all ensure the success of the programme.

Students will receive innovative training in their first year that is tailored to prepare them specifically for their main research project in years 2-4. The main project will cross two or more disciplines (epidemiological, clinical, biological and translational) with pro-active co-supervision, although the student will reside principally in one research group. The integration of disciplines will enable the student to complete their PhD training and graduate with a multidisciplinary set of skills enabling them to establish a top-ranking career in cardiovascular science.

More info...

British Heart Foundation funding awards

Prof Sarah George, Project Grant: Attenuation of vein graft failure by CK2 inhibition. £197k from 1 Sep 2016 for three years.

Dr Stuart Mundell, Project Grant: Regulation of P2Y12 receptor function in smooth muscle cells by antiplatelet drugs. £147k from 1 May 2016 for two years.

Prof Harry Mellor, Project Grant: Mechanisms of neovascularisation: Rhof, FMNL3 and the formation of vascular lumens. £125k from 1 Aug 2016 for two years.

Prof Raimondo Ascione with co-applicants Prof Sarah George and Dr Jason Johnson. The project, Arterial bioengineering of decellularised human saphenous veins to reduce early graft thrombosis and improve long-term patency rate, is for £268k and will run from January 2017 for three years. When veins from patients’ legs are used to make bypass graft surgery (>75% of grafts made; millions per year worldwide), 15% of these vein grafts get blocked at 1 year and 50% get blocked at 10 years. However, when arteries are used (only approx 20% of all grafts) >95% are still functioning after 15-20 years.

With this grant the project will take patient’s veins, remove all the cells to achieve acellular scaffolds (less immunogenic) to be functionalised with growth factors and then transformed in arteries in the lab via cell seeding under dynamic arterial conditions in a modern bioreactor. The obtained bioengineered arteries will then be tested in-vivo at the TBRC. The ultimate goal is to develop a novel arterial graft to be used in adult patients to allow them to get more early and long-term benefit following bypass surgery operations.
Find a Clinical Research Study App

The Clinical Research Network Business Intelligence team has launched a new version of the public Open Data Platform Find a Clinical Research Study app. Its is to provide a tool for clinical research professionals to search for CRN Portfolio studies using specific parameters, such as specialty or study design. The search results then enable the user to view a publicly available, one-page summary of information about each study. The app can be downloaded online.

The UK Clinical Trials Gateway remains the chosen NIHR platform for providing patients and the public with information about clinical research studies taking place in the UK. The app will allow you to search by:
- CPMS Study ID, IRAS ID, MRec, EUDraCT
- study title or short name
- research summary or inclusion/exclusion criteria keywords

Other search values include:
- Study design
- Open to new sites
- Eligibility
- Study Status
- Phase
- Specialties/sub specialties

This version no longer features a “map search” function, which will be re-established at a later date. Send any questions or suggestions to ODP@nihr.ac.uk.

£7.5M boost for Health Research

The Elizabeth Blackwell Institute (EBI) has been awarded the Wellcome Trust’s Institutional Strategic Support Fund (ISSF), designed to support biomedical research and related activities in the UK over the next five years. The ISSF award of £3.75M is being matched by the University. It is the third and largest ISSF award for the EBI and recognises the successful work the Institute has delivered during the previous five years.

The Institute will continue to invest in supporting the next generation of health research leaders by offering fellowships and support for clinical and non-clinical early career researchers. Clinical researchers in particular will benefit from opportunities offered by the EBI and the recently announced Wellcome Trust-funded clinical PhD programme for the South West.

The Institute will also prioritise work on diversity and inclusion, as well as public engagement with focus on building capacity, creating and developing partnerships to co-design and increase the impact of the University’s research.
University Hospitals Bristol NHS Foundation Trust, in partnership with the University of Bristol, has been awarded £21.8M over five years by the National Institute for Health Research (NIHR) to fund cutting-edge research. The Biomedical Research Centre (BRC) will come into being in April 2017 and will allow the two existing Biomedical Research Units (BRUs) to continue the world class research they have been carrying out in the areas of Cardiovascular Disease and Nutrition, Diet and Lifestyle. Alongside this UH Bristol have been funded in three new themes – Surgical Innovation, Mental Health and Perinatal and Reproductive Medicine. The partnership is one of 20 NHS and university partnerships across England to have been awarded funding; each BRC will host the development of new, ground-breaking treatments, diagnostics, prevention and care for patients in a wide range of diseases like cancer and dementia.

More info...

Student Health Sciences Research Journal

The INSPIRE Student Health Sciences Research Journal is produced by a team of student editors from Bristol, Exeter, Plymouth and Cardiff and plays a key part of a collaborative project under the national INSPIRE scheme funded by the Wellcome Trust and administered by the Academy of Medical Sciences.

The scheme aims to encourage student doctors, dentists and vets to consider a career in research, and encourages publication of their work. Since the scheme began in 2013 the southwest INSPIRE partnership has supported more than 70 vacation studentships as well as prize awards. Together with local matched funding, this has enabled students to undertake research projects under the supervision of senior scientists and clinicians.

Following a competition in 2015, a team of seven senior editors came together to set up the journal from scratch in order to provide a platform for publication of student project results, as well as to have direct experience of academic peer review.

The first issue of the journal is available online.
Patients overestimate life expectancy

A review of studies examining perceived life expectancy among people with long term health conditions has found patients may overestimate their life expectancy. In a review of more than 700 patients from the UK, Netherlands and the USA with heart, kidney or lung disease, it was found that patients were around three times more likely to die in the next year than they expected. The findings have significant implications for clinicians, who researchers say should be aware of the expectations of their patients, which may be unrealistic and need to be considered when treatment decisions are being made.

The review involved a systematic search for all studies where people with long term conditions were asked to estimate how long they might live. Nine articles were identified which included a total of 729 patients. Most patients had heart disease, with some patients with smoking-related lung disease and kidney failure also being included. Outpatients with kidney disease who were receiving haemodialysis were more optimistic about prognosis than their doctors, the study found, to the extent that they overestimated their chances of surviving five years.

Read more in the BMJ Open paper authored by Dr Barnaby Hole and student doctor Joseph Salem.

Statins may reduce the risk of blood clots in the vein

A recent publication has confirmed that statins could play an important role in reducing the risk of venous thromboembolism. Statins reduce blood cholesterol levels and are commonly used to prevent heart disease. They can also reduce inflammation and affect the way blood clots in blood vessels. There have been suggestions that statins may prevent venous thromboembolism, a condition in which blood clots form in the veins of the legs or lungs.

A study published by Dr Setor Kunutsor and colleagues at Leicester looked at a meta-analysis of all available studies (totalling 36) published on the topic. These consisted of 13 observational studies (totalling 3,148,259 participants) and 23 randomised controlled trials (118,464 participants). The evidence from both kinds of study clearly showed that the risk of venous thromboembolism was reduced in statin users compared to non-statin users. This effect was observed regardless of age, country of origin, and whether at high or low risk of developing venous thromboembolism. Owing to the limited data available, the authors were unable to show clearly whether this beneficial effect could be attributed to all types of statin.

Though these findings provide clear evidence that statins have a beneficial effect in the reduction of venous thromboembolism, the authors call for further intervention research to validate these results before any guideline recommendations can be made.

Results were presented at the America Heart Association Scientific Sessions 2016 held in New Orleans and have been published in Lancet Haematology.
Festschrift for Professor Andrew Newby

Friends and colleagues of Prof Andrew Newby gathered at Wills Hall on 2 December 2016 for a festschrift to mark his retirement. One hundred and thirty people attended the meeting, which had the theme of Vascular Biology: past, present and future.

Many of Andrew’s previous students, colleagues and collaborators from across Europe presented talks and posters on a range of subjects, including vascular smooth muscle cells, metalloproteinases, unstable atherosclerosis, endothelial dysfunction and vein graft disease. Many of the speakers gave a historical overview of their research and how this was influenced by Andrew’s supervision, mentorship and collaboration. Andrew gave the finale, with heartfelt presentation entitled The Last Gasp, where he summarised the many achievements of his career and thanked his many friends and colleagues who have worked closely with him over the last forty years. The day ended with a celebratory meal at The Orangery, Goldney Hall, where Prof Józef Dulak, president of the European Vascular Biology Organisation, presented Andrew with an EVBO gold medal in recognition of his contributions to the field of vascular biology.

Italy Made Me

The Italian Embassy in London invited young Italian researchers across the UK to submit applications for its annual research award programme “Italy Made Me.” The awards are aimed at Italian researchers operating in the UK who received part of their education in Italy, in recognition of innovative research conducted in each of the three ERC domains: Life Sciences, Physical and Engineering Sciences, and Social Sciences and Humanities. The initiative is co-ordinated by the Italian Embassy in London in collaboration with il Circolo, the Association of Italian Scientists in the United Kingdom (AISUK), the Italian Consulate General in Edinburgh, and many other academic associations and Italian researchers across the UK.

The event was hosted by the Embassy on 7 July 2016, with Dr Dominga Iacobazzi being awarded the prize in Life Sciences for Tissue Engineering Vascular Grafts for Congenital Heart Defect Corrective Surgery Using Human Thymus Derived– Mesenchymal Stem Cells.
Prof Julian Paton has been awarded an International Fellowship from the Royal Society of New Zealand, £150k, for three years.

Prof David Murphy was awarded MRC funding for Regulatory and functional pathways mediating the control of central osmotic defences by hypothalamic transcription factor CREB3L1. The aim is to decipher the detailed molecular mechanisms by which CREB3L1 affects global gene expression in the brain, and hence regulates the crucial hormonal processes that govern water homeostasis.

An ECUSTEC feasibility study award has gone to co-PI Prof Moin Saleem (£1.8 million). This is a clinical trial of Eculizumab in Diarrhoea associated Haemolytic Uraemic Syndrome (HUS). This is a pilot study of 200 patients across the UK, and includes mechanistic studies to study complement activation and VEGF secretion by podocytes.

Bristol Renal, led by Prof Richard Coward, are part of a €15M ERC grant to study diabetic nephropathy. The consortium will be using experimental models to elucidate the mechanisms of the disease based on biomarkers detected in European cohorts of diabetic patients. This grant will allow Richard Coward’s, Moin Saleem’s and Simon Satchell’s group to work together on this subject for next 5 years.

Wellcome Trust Clinical Research Training fellowships allow clinicians the opportunity to undertake funded full-time PhD research, with structured training and mentorship, while maintaining their clinical practice.

Simon Haworth in the School of Oral and Dental Sciences was awarded a fellowship in order to pursue Investigating the causal nature of associations between dental disease, cardio-metabolic traits and cardiovascular outcomes: Providing evidence for a potential role of dentistry in improving population cardiovascular health.

Simon’s research uses newer epidemiological methods in leveraging genetic data to investigate whether there are causal associations between dental health and cardio-metabolic traits. Based mainly at the MRC Integrative Epidemiology Unit, his research will be supervised by Dr Nic Timpson and Prof Steve Thomas both at Bristol, Prof Paul Franks (Lund, Harvard and Umeå), and Prof Nicola West (Bristol).

The three years of full time research funding will allow Simon to attend international courses and conferences and undertake research in Umeå, Sweden.
Support for Data Science

The University’s youngest research institute, the Jean Golding Institute for Data-intensive Research, has started running a data science support service dubbed 'Ask JGI'. The service is available to all staff (and PhD students through their supervisors) and provides advice, support and guidance on all data science queries, including for instance statistical, computing, data management, visualisation, and storage questions.

Support is available via email and 1-1 meetings. The Institute works closely with 'data champions' throughout the University and can therefore triage questions to experts and foster collaborations if they are unable to help directly. Staff can also signpost to other data intensive research facilities in the University such as on Advanced Computing (ACRC) and data storage (RDSF).

Get in touch via ask-jgi@bristol.ac.uk.

Car seats and breathing

Newborn infants may be at risk of breathing difficulties if left in car safety seats for long periods, particularly when travelling. Most UK hospitals require premature infants to complete a ‘car seat challenge’ before discharge. Infants are observed for breathing difficulties or changes in heart rate while in a car seat. However, the test does not take into account the more upright position in a car, or the vibration of the seat when the car is moving. A recent study supported by UoB researcher Prof Peter Fleming is the first to assess the effect of motion on infants and to replicate the angle of the rear right 40° position, along with the vibration experienced in a car, leads to significantly increased heart and respiratory rates, and decreased oxygen saturation. Findings support American Academy of Paediatrics’ guidelines that infant car seats should not be used as a routine infant sleep environment.
The SKArF Study: Identifying proteins in heart tissue relating to atrial fibrillation. Atrial fibrillation (AF) is the most common heart rhythm disorder in the UK, estimated to affect over 1 million people. AF is associated with reduced life expectancy, mainly due to the increased risk of stroke. Current treatments include anti-arrhythmic drugs and surgical procedures. Unfortunately, many effective antiarrhythmics can have serious side effects due to their activity in the ventricles. Professor Neil Marrion’s research group has found proteins called SK channels which are thought to contribute to heart activity in other in the atria. It is suggested that these channels could be a potential target for the development of new anti-arrhythmics without the side effects at the ventricles. This study will collect surplus heart tissue from patients undergoing cardiac surgery, and test these atrial SK channels to see how they affect the electrical activity of the heart in patients both with and without AF. SKArF is a single centre study looking to recruit 90 adult patients who attend the Bristol Royal Infirmary for elective cardiac surgery over 12 months. The study is funded by the British Heart Foundation. The Chief Investigator is Prof Raimondo Ascione, and the University researchers will be led by Neil Marrion.

Clinical Trials and Evaluation Unit: spotlight on SKArF

As a Renal registrar Dr Emily Bowen manages patients with both acute and chronic kidney disease, but she wanted to pursue research interests as well. The EBI Clinical Primer Scheme allowed her to take a break from her clinical commitments in London to join Bristol Renal, headed by Prof Moin Saleem.

The team have made significant breakthroughs in the study of podocytes and glomerular endothelial cells and their interaction in the kidney’s filtration barrier, including causation and treatment when the filtration barrier breaks down. Emily’s research, supervised by Profs Saleem and Richard Coward involved exposing cultures of human and mouse podocytes and human glomerular endothelial cells to different concentrations of Shiga toxin for between 30 minutes and 24 hours. This showed that while mouse podocytes were resistant to the Shiga toxin, in humans cellular stress pathways were activated after just one hour. The preliminary data obtained during the EBI Primer formed the basis of her PhD Clinical Fellowship applications for external funding. She was successful in her first fellowship interview and began her PhD in October 2016:

A Kidney Research UK Clinical Training Fellowship went to Dr Emily Bowen under PI Prof Richard Coward (£220,890) for The role of the podocyte in Shiga toxin associated haemolytic uraemic syndrome. The three-year project will allow Emily to study the molecular biology underpinning Haemolytic Uraemic Syndrome which is the leading cause of Acute kidney injury or failure in children.
Students and Early Career Researchers

Emma Hart and Julian Paton, was awarded best poster at the European Society of Cardiology Congress, Rome, 27-31 August 2016.

Dr Wioletta Pijacka (pictured right) in Julian Paton’s group was awarded the International Society for Hypertension’s "New Investigator Award" at their conference in Seoul, 24-29 September 2016.

Thomas Blair (supervisor: Ingeborg Hers) and Yiting Wang (supervisor: David Sheppard) were both successful in their PhD examination and also were identified by their examiners as carrying out outstanding pieces of work which won Faculty Commendations.

Dr Cristina Beltrami, a post-doctoral researcher in Costanza Emanueli’s lab, was successful in her application for the EFSD Albert Renold Travel Fellowships. She travelled to New York to work at the lab of Prof Sahoo in order to learn a new technique (the m6A-seq).

Dr Amy Burchell, a Clinical Research Fellow working with

External engagements

Prof Julian Paton has been appointed on to the Editorial Board for the journal Current Opinion in Physiology published by Elsevier.

Dr Maarten Koeners (see image) had his research into chronic kidney disease (CKD) featured in the BHF’s Heart Matters magazine. In the UK CKD affects ~ 8.5% of adults and one in three will develop some level of the disease in their lifetimes. It’s a condition that costs the NHS £1.45bn per year, and it kills more people than prostate cancer or breast cancer. And what’s more, there are no specific treatments – only treatments for the side effects such as high blood pressure, high blood glucose, and anaemia. More info…

Prof Moin Saleem gave the keynote opening lecture at the three-yearly International Paediatric Nephrology Association Congress, Iguacú, Brazil 20-24 September 2016. His talk was entitled Molecular Stratification of Nephrotic Syndrome.

Prof Andres Lopez Bernal was interviewed by New Scientist for an article that appeared on 12 September 2016. Placenta’s alarm clock signals when it’s time for birth explores the use of drugs that could affect the clock action of the membranes surrounding the foetus to bring down the number of premature births. Every year some 15 million babies are born before 37 weeks gestation; this accounts for 8% of infant deaths in the UK.

Prof Mark Cannell has been elected a fellow of the International Society for Heart Research. Fellows are selected solely on the basis of scientific excellence, as evidenced by publications in high-impact journals.
Professor Iredale, Pro Vice-Chancellor for Health, has created a new Health Research Strategy Committee with broad membership across the Faculties of Health and Biomedical Sciences including Deans, Faculty Research Directors, Heads of Schools and the Elizabeth Blackwell Institute. The committee will be chaired by the new Director of Research for Health, Professor Jeremy Tavare (pictured left). The Committee will debate and develop a unified health research and innovation strategy across the two faculties and take an overview of its delivery by the Faculties and Schools with support from the Research and Enterprise Development team.

Terms of reference and minutes of meetings are available on the Committee’s intranet. If you have any questions regarding the committee, please email healthresearch-committee@bristol.ac.uk.

Brain stimulation for high blood pressure

Amely Hoffmann’s blood pressure was extremely high and all other drugs and devices had been tried in an attempt to reduce it without success. She had suffered high blood pressure for ten years, which was causing exhaustion and migraines, and was taking eight different antihypertensive drugs, which were also causing side effects.

After a chance discovery online Mrs Hoffmann got in touch with consultant neurosurgeon Mr Nik Patel to see if he could help her. In 2011 Mr Patel had published details of a previous case where deep brain stimulation (DBS) had been used for neuropathic pain but the procedure had also resolved his hypertension. DBS involves inserting an electrode into the brain, which is connected to a device similar to a pacemaker that stimulates a specific area of the brain. It is typically used in patients with Parkinson’s and those with intractable pain. By targeting the periaqueductal grey (PAG) region of the brain to control severe pain Mr Patel had discovered the impact it could have on blood pressure.

Mrs Hoffmann became the first known person in the world to have elective DBS for a cardiovascular disease in May 2012 at Frenchay Hospital as part of a research trial.

When she first visited Bristol Mrs Hoffmann’s blood pressure was 320/150 mmHg; a patient with severe hypertension would typically have blood pressure of 180/90 mmHg. Following the DBS procedure this dropped to 100 – 150 mmHg and she was able to stop taking seven of the eight drugs she had previously needed. Two and-a-half years later, the DBS effect has been sustained and her blood pressure ranges between 180 – 220/130 mmHg and her quality of life has improved. These results are quite encouraging and could lead to wider cohort studies.

More funding successes

**MRC Global Challenges**
award to Prof Moin Saleem to set up an international registry and biobank of nephrotic syndrome (paediatric and adult), and to train local laboratories in techniques to investigate novel clinical biomarkers across 4 centres: Delhi, Bangalore, Cairo and Johannesburg. £600,000: Study of trans-national cohorts of nephrotic syndrome to alleviate disease burden.

**Alzheimer’s Research UK**
Network Accelerate Scheme to Prof Seth Love for Network for the development, validation and implementation of new methods to measure vascular dysfunction in dementia. £227,253 from 01 Oct 2016 for two years.

Prof Julian Paton (PI) with Dr Rohit Ramchandra (Co-PI) have been awarded a Health Research Council, New Zealand grant for Respiratory sinus arrhythmia: novel device mediated natural pacing in heart failure sheep. NZ$1.2M for three years. Industry link to Ceryx Medical.

**MRC Global Challenges**
award to Prof Robert Hinchliffe has received funding from the David Telling Charitable Trust for Clinical Trials for Elective and Emergency Abdominal Aortic Aneurysm Repair, £116,618 from 01 Jan 2016 for 3 years.

Dr Phil Clatworthy, joint British Association of Stroke Physicians and NIHR Clinical Research Network Stroke Portfolio Development Award. A small grant of £2000 that will bring together a writing group in the field of stroke related visual impairment.

Lassoing from the mouth to the heart

Inf ective endocarditis occurs when bacteria cause unwanted blood clots to form on heart valves. Untreated it is fatal; even treated mortality rates are ~ 30%. There are over 2,000 cases diagnosed in the UK annually, and cases are rising.

Using the X-ray microscope at Diamond Light Source a UoB team were able to visualise the structure and dynamics of protein CshA which was believed to play an important role in targeting the oral bacterium Streptococcus gordonii to the tissues of the heart. They were intrigued to find that CshA acts as a ‘molecular lasso’ to enable *S. gordonii* to bind to the surface of human cells. Such adhesive interactions are critical first steps in the ability of this bacterium to cause disease. The study, which appears as ‘Editors’ Picks’ in the *Journal of Biological Chemistry*, was conducted in collaboration with Prof Rich Lamont at the University of Louisville, USA.

The work has revealed a completely new mechanism by which *S. gordonii* and related bacteria are able to bind to human tissues, which they have named ‘catch-clamp’. The team demonstrated that the terminal portion of CshA is very flexible, allowing it to be cast out like a lasso. When the lasso contacts fibronectin on the surface of human cells (the ‘catch’), it brings CshA and fibronectin into close proximity. This then enables another portion of CshA to tightly ‘clamp’ the two proteins together, anchoring *S. gordonii* to the host cell surface.

The work opens up new possibilities for designing anti-adhesive agents that target disease-causing bacteria.
Heart Research UK studentship to Prof Paolo Madeddu, £76,054. Umbilical cord pericyte-engineered grafts for correction of congenital heart defects. Congenital heart disease (CHD) is the most common type of birth defect, with a reported prevalence of 9 per 1,000 live births. Animal-derived vascular grafts are currently used for surgical correction of CHD. The xenograft manufacture includes a decellularisation step to reduce the risk of immune rejection upon implantation in human recipients. However, decellularised xenografts are unable to match the growth of a baby’s heart, therefore repeated risky operations become necessary to replace failing grafts. A solution to this problem consists of engineering the xenograft with the patient’s own cells to confer properties of a living tissue that grows in a physiologic manner. They propose to generate umbilical cord pericytes (UCP)-engineered vascular grafts for correction of complex CHD. Pericytes are of increasing interest as ideal regenerative cell products. The availability of cords at birth makes this tissue a precious and abundant source of autologous pericytes. The novel vascular graft will provide a solution for definitive correction of heart defects with immense medical benefits. The studentship starts from 1 March 2017 for a period of three years.

To Prof Alastair Poole (top left), an award of £122,386 will provide a studentship to pursue a project entitled Role of the mitochondrial kinase PINK1 in platelet procoagulant function and thrombosis. It will run from Jan 2017 to Jan 2020.

To Prof Paolo Madeddu (bottom left) and Dr Richard Day (Division of Medicine, UCL), £204,681. Improved methods for delivering cells to treat cardiovascular disease are now sought. Adipose-derived mesenchymal stem cells (AD-MSC) cultured on surfaces with specific hierarchical topographical features secrete factors that stimulate angiogenesis in vitro. The team hypothesize the technology could provide a feasible and transformative approach for treating peripheral arterial disease and other types of cardiovascular disease. The project will investigate the feasibility of using microparticles exhibiting the hierarchical topographical features to stimulate the secretion of angiogenic factors from AD-MSC that will induce neovascularization and restore blood flow in ischaemic tissue.

BHF funding: Part 2

To Prof Jules Hancox (PI) with co-applicants Drs Ana Abdala Sheikh (pictured below) and Andrew James. A project grant entitled Investigation of cardiac late sodium current as a therapeutic target in Rett Syndrome. £252,678 for two and a half years.
Early career training and support

The Faculties of Biomedical Sciences and Health Sciences have a dynamic postgraduate community enrolled in taught or research-based programmes. Postgrads receive their training in internationally renowned research groups which span the biomedical science disciplines of Biochemistry, Cellular and Molecular Medicine and Physiology, Pharmacology and Neuroscience through to the disciplines associated with population health which include life course epidemiology, genomics, primary care and public health with a particular emphasis on methodology. Research takes place in laboratories within the University and in clinical settings across Bristol, including the University Hospitals Bristol Trust, North Bristol Trust, as well as general practices and other community health services.

For further details go to page 19 or the Elizabeth Blackwell Institute (EBI) website.

One recent success is Marc Amoyel, who won an EBI Early Career Fellowship to pursue a project entitled The genetics of stem cell competition.

Outcomes for unborn twins sharing a placenta

A unique two-year research project to better identify the cardiac function of monochorionic twins with twin-to-twin transfusion syndrome (TTTS) has been unveiled by St Michael’s Hospital and the Clinical Research and Imaging Centre (CRIC).

Funded by The Capella Foundation, the project will seek to find out how the syndrome develops and identify ways to improve survival outcomes. The team will investigate novel techniques, using the latest ultrasound imaging equipment. New techniques for functional cardiac assessment will be developed in order to better diagnose and identify treatment that will help reduce the risks associated with the condition.

Monochorionic twins have a shared placenta and are in a higher risk group. Data released by the Office of National Statistics has indicated that multiple birth rates are rising, with 10,989 multiple births in 2014 compared to 10,783 in 2013. In 2015 monochorionic, diamniotic twin pregnancies made up approximately 30% of all twin pregnancies and approximately 15% of these are complicated by TTTS, a morbid condition that if untreated leads to foetal demise in 90% of cases, caused by the presence of unidirectional, intertwin, vascular anastomoses on the placenta causing a haemodynamic imbalance between the twins.

The team will investigate new techniques to investigate heart function for unborn monochorionic twins, using the latest ultrasound imaging equipment to scan the hearts of unborn twins, whilst they are in the uterus. The programme is currently scanning all twins with this condition across Bristol, Bath and the South West of England.
A purpose-built microscopy suite to accommodate expansion of the Wolfson Bioimaging Facility was officially opened by Paul Ramsbottom, Chief Executive of the Wolfson Foundation, on 8 July 2016. The facility currently houses imaging systems covering a broad range of advanced fluorescence and electron microscopy techniques. The arrival of new systems including multiphoton, super-resolution and fluorescence lifetime imaging alongside expansion of confocal and wide-field microscopy required more space.

A donation of £1M by the Wolfson Foundation was vital in helping to create six purpose-built microscope rooms to accommodate new equipment. The new imaging suite is situated adjacent to existing microscope rooms and provides the controlled and stable environment required for high-resolution microscopy. The facility has also recently increased the level of support it offers for image processing and analysis to equip its users with the expertise to fully quantify and interpret microscopy data.

Details of the facilities are available on the website.

Smart stem cells home to damaged tissue

Stem cell-based therapy promises cures for a multitude of diseases and disorders including regeneration of heart tissue, but is severely limited by the ability of stem cells to identify the damaged location and remain there after administration.

Dr Adam Perriman (left) is known for his pioneering research on the construction and study of novel synthetic biomolecular systems (hybrid bionanomaterials) using advanced physical techniques. Hybrid bionanomaterials can comprise highly cooperative biological and synthetic components that can be used to amplify or attenuate the assembly process in the damaged tissue, and the modular/systems methodology that underpins directed assembly can provide a mechanism for the development of non-traditional approaches to regenerative medicine.

Together with an interdisciplinary team (Dr Paul Race, Prof Raimondo Ascione and Dr Sabine Hauert) he used the Catalyst Fund award from the Elizabeth Blackwell Institute to design and construct novel protein-polymer nanohybrids that included introduction of special homing proteins into the cell membranes of adult mesenchymal stem cells (MSCs, the type of cells that can develop into a variety of cell types), a technique known as ‘stem cell painting’. This technique offers a significant improvement on other existing cell therapy methods (such as intravenous or intra-arterial infusion of MSCs), which commonly lead to undesirable accumulation of the cells at the lungs and liver, thus reducing the efficiency of systemic delivery and increasing the likelihood of producing potentially lethal microemboli.
Stroke Research Group

The Stroke Research Group is a rapidly developing independent but collaborative group of researchers. Stroke research is a priority area for growth within the Institute of Clinical Neurosciences over the coming years; the group is host to an expanding portfolio of research.

The Stroke Research Group has closely associated with the clinical stroke service at North Bristol Trust, which provides a comprehensive stroke service including interventional neuroradiology and thrombectomy, vascular surgery, neurosurgery and specialist stroke rehabilitation.

The Group uses a range of techniques including:

- MRI (e.g. fMRI, tractography)
- Gaze tracking
- Psychophysics
- Gait tracking
- Transcranial Direct Current Stimulation (tDCS)
- Cognitive testing
- “Off-the- shelf” EEG

There is also an intention to develop further research areas and techniques, including:

- Mesenchymal stem cells for treatment of stroke
- Genetics and cognition/rehabilitation (MRC Integrative Epidemiology Unit)
- MR spectroscopy
- Gait lab with visual environment modulation
- SPHERE project using technology for monitoring health in people’s homes

Current research themes and collaborations:

a. Visual impairment in cerebrovascular disease
   - Gait and balance in hemianopia and visuospatial neglect with Prof Simon Rushton and Dr Matt Dunn, University of Cardiff
   - Rehabilitation of visual impairment after stroke; perceptual learning and transcranial stimulation for visual rehabilitation with Dr Holly Bridge and Dr Stephanie Larcombe, University of Oxford
   - Gaze tracking during real-world tasks in cerebrovascular visual impairment with Prof Iain Gilchrist, School of Experimental Psychology, and Dr Ailie Turton, University of the West of England

b. Stroke imaging
   - Quantitative stroke MRI, including hyperacute stroke MRI with Dr Michael Knight, University of Bristol, including a Dunhill Medical Trust grant to the group (£200k) to investigate quantitative T2 MR imaging to measure duration of ischaemia and tissue fate in hyperacute stroke, including Universities of Oxford and Glasgow
   - Automated segmentation and analysis of brain images for clinical decision support with Dr Robin Holmes, University of Bristol

c. Cognition and cerebrovascular disease
   - Large scale networks and cognition in TIA and cerebrovascular disease with Dr Nina Kazanina, School of Experimental Psychology and Dr Catherine Pennington, ReMemBr Group, University of Bristol
   - Cognition in cerebrovascular disease, and links to renal disease and uro-neurology with Prof Pat Kehoe, Dementia Research Group, University of Bristol, Dr Catherine Pennington, ReMemBr Group, University of Bristol, Prof Marcus Drake, University of Bristol and Dr Albert Power, North Bristol NHS Trust

d. Other collaborative projects include:
   - M-MARK, NIHR i4i Grant (£1M) to University of Southampton to develop a garment with internal electronics and tablet-based user interface to aid home-based upper limb rehabilitation

Group heads:

Dr Phil Clatworthy
Prof Risto Kauppinen
**ELIZABETH BLACKWELL FUNDING OPPORTUNITIES**

**EBI Workshops Funding**
Support for interdisciplinary workshops in health research at a new or emerging interface between two or more disciplines. Applications are reviewed on a rolling basis.

**EBI Catalyst Fund**
Pump priming awards can support the most promising and ambitious ideas across the widest interdisciplinary boundaries. These projects will be identified largely through the running of workshops to explore new possibilities and identify the big questions. Applications are reviewed on a rolling basis.

**EBI MRC Confidence in Concept Scheme (CiC)**
To support health related translational projects which are at the stage of proof of concept (Confidence in Concept Awards). Open to all UoB academic staff. **Deadline: 20 March 2017**

**EBI Translational Acceleration and Knowledge Transfer (TRACK)**
Funding to support health related translational projects which are at the stage of concept development. Successful outline applications will be invited to submit a full application for concept development funding. Open to all UoB academic staff. **Deadline: 26 April 2017**

**Returning Carers Scheme**
UoB has introduced a Returning Carers’ Scheme (RCS) to support academic staff across all faculties in re-establishing their independent research careers on return from extended leave (16 weeks or more) for reasons connected to caring - such as maternity leave, adoption leave, additional paternity leave or leave to care for a dependent. Deadlines: 30 April and 31 October each year.

**EBI Bridging Funds for Senior Fellows**
This scheme is designed to support a small number of academic staff at the University of Bristol who currently hold an externally funded research fellowship. Applications accepted on a rolling basis.

**EBI Postgraduate Discipline Hopping Fellowships**
Designed to support a small number of postgraduate researchers currently enrolled on one of the University of Bristol Wellcome Trust-funded 4 year PhD programmes (Dynamic Cell Biology, Neural Dynamics & Molecular, Genetic and Lifecourse Epidemiology). **Deadline: 27 April 2017.**
A calendar of potential funding opportunities for cardiovascular sciences has been set up via Research Professional (RP). Subscribing to a calendar will place the entries in your own calendar, which will update automatically according to pre-specified search criteria. Staff and students have FREE access to Research Professional online from all computers on the University network. You can create your own personalised funding opportunity e-mail alerts by registering with RP. Find out all about it on the RED website.

The listing below represents a brief selection of available funding for the cardiovascular community. Full listings of opportunities are sent out via Faculty Research Directors and/or School Research Directors, and are available on the Research Development website. Note that some calls may be subject to a major bids process, and all details are on the website.

**Vascular Anaesthesia Society of Great Britain and Ireland**

**Departmental awards**

Closing Date: none  
Award amount: £10,000

Support research and audit projects in the field of vascular anaesthesia undertaken by anaesthetic trainees. The purpose is to advance both the care of patients undergoing vascular procedures and the training and development of the vascular anaesthetics of the future. The lead applicant must be a member of the VASGBI and hold a substantive consultant or equivalent. The research project must be undertaken by trainees and fellows not holding a substantive or locum consultant post.

**British Society of Echocardiography**

**Travel bursaries**

Closing Date: none  
Award amount: 75% of incurred costs

Enable members to attend echo meetings. Each applicant must be a current BSE member working in a public hospital in the UK or Ireland. Priority is given to physiologists over medics. No more than one award will be given to a single institution in the travel bursary year.

**NIHR CLAHRC West**

**Training bursary scheme**

Closing date: 01-Feb, 01-Jun, 01-Sep annual  
Award amount: £600
Gives staff from the local NHS, health and social care sector the opportunity to attend high quality research and evaluation training at half the price. Bursaries are available for 50 per cent of the course fees; the applicant or their employer is expected to fund the remaining 50 per cent. The bursary aims to promote wider engagement and improve skills in research and evidence in the CLAHRC West patch, particularly for those who have not previously had opportunities for this type of training.

**Wellcome Trust**

*Four-year PhD studentships in science*

Closing date: none  
Award amount: unspecified

Enable students to undertake in-depth postgraduate training at centres of excellence throughout the UK in the following biomedical research and public health research areas:

- developmental biology and stem cell biology
- genomics and population health
- immunology and infectious disease
- molecular and cellular biology
- neuroscience
- physiological sciences
- computational, quantitative and structural biology

**British Heart Foundation**

*Immediate postdoctoral basic science research fellowship*

Closing date: none  
Award amount: unspecified

Enable newly qualified postdoctoral researchers to make an early start in developing their independent cardiovascular research careers in an established institution in the UK. The fellowship is awarded for a period of up to four years. Funding includes the fellow’s salary, research consumables and small items of equipment.

**British Society for Cardiovascular Research**

*Seminar funding scheme*

Closing date: none  
Award amount: £200

Supports institutions running cardiovascular seminars.

**British Heart Foundation**

*New horizons grants*

Closing date: none  
Award amount: £300,000
These encourage scientists from outside traditional cardiovascular biology to engage in cardiovascular research. Grants are worth up to £300,000 each for up to three years. Funding covers research consumables and essential equipment and staff salaries, excluding PhD students.

**Bayer**

Grants4Targets – novel targets for drug development

Closing date: 31 Mar 17  
Award amount: €125,000

Aims to encourage research on novel targets and disease-related biomarkers in the fields of oncology, gynaecology, cardiology, haematology and ophthalmology. Support grants for early stage research are worth between €5,000 and €10,000, and focus grants for more mature ideas are worth between €10,000 and €125,000.

**Vascular Anaesthesia Society of Great Britain and Ireland**

Trainee research and audit departmental awards

Closing date: 31 Mar 17  
Award amount: £5,000

These support research and audit projects in the field of vascular anaesthesia undertaken by anaesthetic trainees. Awards are worth up to £5,000 each for up to two years.

**VASGBI project grant**

National Institute of Academic Anaesthesia

Closing date: 21 Apr 17  
Award amount: £40,000

Supports research projects related to vascular anaesthesia.

**European Association for Cardio-Thoracic Surgery**

C Walton Lillehei young investigator award

Closing date: 30 Apr 17  
Award amount: US$10,000

Provides additional support to the cardiovascular community for research efforts in the field of heart valve surgery.
**Pathophysiological consequences of receptor mistraffic:**

**Tales from the platelet P2Y_{12} receptor**

Cunningham MR, Aungraheeta R and Mundell SJ

2017 (in press). *Molecular and Cellular Endocrinology*, available online 14 February 2017

<table>
<thead>
<tr>
<th>P2Y_{12}R mutation</th>
<th>Location</th>
<th>Effect</th>
<th>Ref</th>
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</thead>
<tbody>
<tr>
<td>R296Q / R205W</td>
<td>TMD; ECL3</td>
<td>Normal ligand binding / defective signal transduction</td>
<td>27</td>
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<tr>
<td>P258T</td>
<td>ECL3</td>
<td>Reduced receptor function</td>
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<tr>
<td>K174E</td>
<td>ECL2</td>
<td>Reduced ligand binding</td>
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<tr>
<td>H167Q</td>
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<tr>
<td>R112C</td>
<td>ICL2 with DRY motif</td>
<td>Decreased surface expression / enhanced constitutive activity / traffic</td>
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<tr>
<td>P341A</td>
<td>C-terminus within PDZ binding motif</td>
<td>Defective intracellular traffic</td>
<td>32</td>
</tr>
</tbody>
</table>

**P2Y_{12} Receptor snake plot.** Sites of naturally-occurring variants found in patients with a bleeding history are highlighted in green. Key amino-acid regulatory motifs are highlighted in yellow (specifically E/DRY motif and type 1 PDZ ligand).

Details of these variants and their consequences upon receptor function outlined in adjacent table (ECL: extracellular loop, ICL: intracellular loop, TMD: transmembrane domain).

Genetic variations in G protein-coupled receptor (GPCR) genes can disrupt receptor function in a wide variety of human genetic diseases, including platelet bleeding disorders. Platelets are critical for haemostosis with inappropriate platelet activation leading to the development of arterial thrombosis, which can result in heart attack and stroke whilst decreased platelet activity is associated with an increased risk of bleeding. GPCRs expressed on the surface of platelets play key roles in regulating platelet activity and therefore function. Receptors include purinergic receptors (P2Y_{1} and P2Y_{12}), proteinase-activated receptor (PAR1 and PAR4) and thromboxane receptors (TPα), among others. Pharmacological blockade of these receptors forms a powerful therapeutic tool in the treatment and prevention of arterial thrombosis. With the advance of genomic technologies, there has been a substantial increase in the identification of naturally occurring rare and common GPCR variants. These variants include single-nucleotide polymorphisms (SNPs) and insertion or deletions that have the potential to alter GPCR expression or function. A number of defects in platelet GPCRs that disrupt receptor function have now been characterized in patients with mild bleeding disorders. This review will focus on rare, function-disrupting variants of platelet GPCRs with particular emphasis upon mutations in the P2Y_{12} receptor gene that affect receptor traffic to modulate platelet function. Further this review will outline how the identification and characterization of function-disrupting GPCR mutations provides an essential link in translating our detailed understanding of receptor traffic and function in cell line studies into relevant human biological systems.
The Bristol Heart Institute is run by a steering group. Members currently include:

**Director:**
Gianni Angelini, BHF Professor of Cardiac Surgery and Director of the Biomedical Research Unit for Cardiovascular Disease

**Deputy Director:**
Alastair Poole, Professor of Pharmacology and Cell Biology

- Dr Chiara Bucciarelli-Ducci *Imaging*
- Prof Massimo Caputo *Congenital Heart Surgery*
- Prof Costanza Emanueli *Cardiovascular Regeneration*
- Prof Sarah George *Cardiovascular Signalling*
- Dr Emma Hart *Autonomic Regulation & Dysfunction*
- Dr Andrews James *Cardiac Biology*
- Dr Thomas Johnson *Cardiology*
- Dr Stuart Mundell *Vascular Biology and atherothrombosis*
- Prof Ruth Newbury-Ecob *Clinical Genetics*
- Dr Simon Satchell *Renal, Diabetic & Hypertensive Disease*
- Prof Saadeh Suleiman *Cardiac Biology*
- Dr Nicholas Timpson *Population Health and Epidemiology*
- Prof Robert Tulloh *Consultant Paediatric Cardiologist*
- Collette Sheahan *RED liaison*

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