BCV is an internationally recognised centre of excellence for performing translational cardiovascular research that takes basic science discoveries into the clinic. By uniting more than 200 basic and clinical scientists, spread over three faculties of the University plus local NHS Trusts, we are able to facilitate multidisciplinary collaboration between scientists and clinicians and improve medical treatment of cardiovascular diseases.

We have made major contributions to understanding how arterial smooth muscle cells behave and how these behaviours contribute to atherogenesis and to vein graft failure. Our research has also greatly increased our understanding of matrix degrading metalloproteinases in weakening the plaque extracellular matrix and the pathways that regulate their production.

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   - The Placenta, Hypoxia and the Mitochondria, 17 July 2015
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   - The Drugs Work, 30 July 2015
   - 3rd Annual Congress of the European Society of the Translational Medicine, 1 September 2015
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- Julian Paton was appointed Consultant for Afferent Pharmaceuticals
- Julian Paton and colleagues were awarded funds by UoB’s 2014 Developmental Fund to develop an MRI-compatible amplifier
- The first human trials of lab-produced blood to help create better-matched blood for patients with complex blood conditions has been announced by Ashley Toye and Dave Anstee
- An award by the Sir Jules Thorn Charitable Trust has gone to Massimo Caputo to investigate the use of stem cell therapy for the repair of congenital heart abnormalities in very young children
- Anja Teschemacher has been awarded a three year 'Science without Borders' PhD studentship
- Julian Paton received the 2015 Distinguished Visitor Award from the University of Auckland
- A new tissue ‘scaffold’ technology has been discovered that could one day enable the engineering of large organs
- New research shows that patients having heart surgery do not benefit if doctors wait until a patient has become substantially anaemic before giving a blood transfusion
- Anne-Marie O’Carroll, Stephen Lolait and Julian Paton have been awarded a BHF Project Grant
- Marcus Drake, Chris Fry, Tony Pickering and Julian Paton have been jointly awarded an RO1 grant by the National Health Institute (USA) with the University of Pittsburgh
- Martin Lewis has been awarded a 3-year MRC clinical research training fellowship
- Mark Cannell, Jules Hancox and Guillaume Chanoit were awarded an MRC programme grant
- Costanza Emanueli has been awarded a BHF Chair in Cardiovascular Science alongside a 5-year BHF Programme Grant

5) ANDREW HALESTRAP - a recap of his many important scientific contributions by Dick Denton

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7) WHAT IS A HIT? - What is a HIT (Health Integration Team) and how do I become part of one?

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10) SHOWCASED PUBLICATION - Differences in the profile of protection afforded by TRO40303 and mild hypothermia in models of cardiac ischemia/reperfusion injury

11) RECENT PUBLICATIONS
Welcome to the Summer 2015 BCV newsletter. Among the important news for BCV since the last newsletter is the outcome of the University’s Biomedical Review, in which Cardiovascular Research was identified as one of the University’s flagship research areas. While it is gratifying, undoubtedly positive and potentially important for cardiovascular research to be recognised in this way, it is less clear what this will mean in practical terms, and how it will help support and develop cardiovascular research in the future, although this is under discussion. BCV will, however, arrange a meeting for all PI’s to discuss how we, as a community, would like to build on this opportunity.

We also have another cause for celebration: Costanza Emanueli has recently been awarded a BHF Chair. These Chairs are extremely prestigious and are awarded to leaders in their field. Costanza’s Chair brings the total in Bristol to three, with Gianni Angelini and Andrew Newby, reflecting Bristol’s strength in cardiovascular research. Many congratulations, therefore, to Costanza, for this recognition for her work, which is also an accolade for Bristol.

Rather less positive has been the response to recent attempts by Carmen Coxon and Dario Melgari to bring together our early career community. Please can I ask all PI’s to encourage early career researchers (ECRs) in their labs to attend these events. Attendance can only advantage the ECRs, by bringing them into contact with people with different expertise and interests, thereby giving them a broader knowledge of the BCV community, its expertise, and the potential for collaboration, benefitting them, their work and their lab. I very much hope, therefore, that all PI’s will support this initiative.

Finally, this is my last newsletter as Chair of BCV; Rob Tulloh will be taking over from me during August. During my time as Chair, I have tried to consolidate and build on the reorganisation undertaken by Andrew Halestrap and Rob will, I know, build on the opportunities now available. I would like to thank the BCV steering group, and particularly Julian Paton and Alastair Poole who are stepping down at the same time as me, for their dedication and hard work, and for making the group a pleasure to work with. I would also like to thank those who have stepped up to organise BCV events – this is hard work, but satisfying, and important for the community and if anybody has ideas for an event they would like to organise I am sure that Rob would love to hear from you. Finally I would like to thank Collette Sheahan and Catherine Brown from RED, for their inimitable help, support and organisation of everything from steering group meetings to ECR events; without them the role of Chair would be far more onerous.
MEET THE NEW CHAIR

Professor Robert Tulloh is a Consultant Paediatric and Adult Congenital Cardiologist with special interest in Pulmonary Hypertension. He is Honorary Professor in Congenital Cardiology at the University of Bristol. He graduated in Medicine at Oxford University, trained in Paediatrics, and specialised in Paediatric Cardiology. His training locations included Dartmouth Medical School, John Hopkins Hospital and two years as a Research Fellow at the Institute of Child Health, London, undertaking research work on neonatal pulmonary hypertension.

He is involved actively in research: to develop new methods of assessing and treating pulmonary hypertension in children and adults with congenital heart disease; Kawasaki disease and also Viruses in Congenital heart disease. He was a key author in the major trials on Respiratory Syncitial Virus prophylaxis in congenital heart disease. He has been involved in education and teaching and has written several educational book chapters, has more than 135 published papers and has given over 150 presentations at international meetings.

He is very much looking forward to his tenure as BCV Chair, and welcomes input from members across the community.

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Chairman of Bristol CardioVascular
University Hospitals Bristol NHS Foundation Trust

EVENTS

Advances in the biochemistry of ischaemia and hypoxia
17 July 2015, 9:00. Wills Memorial Building

The Placenta, Hypoxia and the Mitochondria
17 July 2015, 11:00. Andrew Murray (University of Cambridge), UHBristol Education Centre

Mesenchymal stem cells: Identification, and understanding the mechanisms of tissue repair
21 July 2015, 12:00. Dr Ivo Kalaijzic (Universities of Connecticut and Osilek), Southmead Hospital

The Drugs Work
30 July 2015, 19:00. Professors David Nutt (Imperial College) and George Davey Smith (University of Bristol), Great Hall, Wills Memorial Building
3rd Annual Congress of the European Society of the Translational Medicine
1 September 2015, 9:00. Vienna

Pharmaceutical and Biotechnology Industry Event
15 September 2015, 10:00. Wills Memorial Building

One Science: Life at the Interface - Wellcome Trust
22 September 2015, 10:00. Wellcome Collection, London

Circulating Biomarkers 2015
30 September - 1 October 2015, 9:00. Beatson Institute for Cancer Research, Glasgow

West of England Academic Health Science Network Annual Conference
15 October 2015, 9:30. Cheltenham Racecourse

University Hospitals Bristol Research & Innovation Day
4 December 2015, 9:30.

NEWS

● EurekAlert! is an online resource for science, health and technology news run by the American Association for the Advancement of Science. One of its top news releases attracted a record number of online hits over the last 12 months, a research story covering a publication by F. Tang, S. Lane, A. Korsak, J. F. R. Paton, A.V. Gourine, S. Kasparov & A. G. Teschemacher which appeared in February’s issue of Nature Communications. With 177,830 views, the article describes how the authors had identified a previously unknown mechanism in the body which regulates the hormone lactate, crucial for motivation, stress responses and control of blood pressure, pain and appetite. The breakthrough could be used to design drugs to help fight health problems connected with these functions in the future.

● Professor Julian Paton was appointed Consultant for Afferent Pharmaceuticals based in California; the company has also gifted him £70,000 towards his research on hypertension and the role of the carotid body.

● Professor Julian Paton and PIs Drs David Cussans & Emma Hart were awarded £14k by the University of Bristol’s 2014 Developmental Fund to develop an MRI-compatible amplifier

● The first human trials of lab-produced blood to help create better-matched blood for patients with complex blood conditions has been announced by Dr Ashley Toye at UoB and Professor Dave Anstee from NHS Blood and Transplant. The process involved the use of stem cells from adult and umbilical cord blood to create a small volume of manufactured red blood cells; it is hoped that when the production is scaled up, it will offer an alternative to specialist patients with blood disorders such as sickle cell anaemia and thalassemia who require treatment with regular transfusions and for whom it is difficult to find compatible donors.

● Professor Massimo Caputo has been awarded £1.4 million by the Sir Jules Thorn Charitable Trust to investigate the use of stem cell therapy for the repair of congenital heart abnormalities in very
young children. Thanks to advances in treatment and care more than eight out of 10 babies with congenital heart defects grow up to be adults; however, the long-term outcomes for most of them remain poor. The team will work with colleagues at Bristol Royal Hospital for Children on the five-year project, which aims to create ‘live’ tissues using the patient’s own stem cells seeded on grafts used in everyday surgery.

- **Dr Anja Teschemacher** has been awarded a three year 'Science without Borders' PhD studentship from September 2015. Awarded by the Ministry of Science, Technology and Innovation of Brazil, the project is entitled *Role of signalling between astrocytes and central noradrenergic neurones in control of the cardiovascular system*.

- **Professor Julian Paton** received the 2015 Distinguished Visitor Award from the University of Auckland. The award aims to enable scholars and researchers who have made very significant contributions to their disciplines to visit The University of Auckland and to participate in the intellectual life of the University. He was hosted in February 2015 by Dr Carolyn Barrett in the Department of Physiology; he spent time with researchers in the Department of Physiology, the Faculty of Medical and Health Sciences and the Auckland Bioengineering Institute, and gave a public lecture exploring the recent advances in the treatment of cardiovascular disease.

- **Scientists have developed** a new tissue ‘scaffold’ technology that could one day enable the engineering of large organs. Research led by Dr **Adam Perriman** from UoB and Professor **Anthony Hollander** from the University of Liverpool has shown that it is possible to combine cells with a special scaffold to produce living tissue in the laboratory. It is hoped this can then be implanted into patients as a way of replacing diseased parts of the body. Until now, the approach has generally been limited to growing small pieces of tissue, as larger dimensions reduce the oxygen supply to the cells in the centre; this project used cartilage tissue engineering as a model system for testing a new method of overcoming the oxygen limitation problem. They synthesised a new class of artificial membrane binding proteins that can be attached to stems cells; by attaching an oxygen-carrying protein, myoglobin, to the stem cells before they are used to engineer cartilage, they ensure that each cell has its own oxygen reservoir that it can access when the oxygen in the scaffold drops to dangerously low levels. Their new methodology, describing the conversion of a normal protein into a membrane binding protein, is likely to pave the way for the development of a wide range of new biotechnologies.

- **New research has** shown that patients having heart surgery do not benefit if doctors wait until a patient has become substantially anaemic before giving a blood transfusion. In the UK, about half of all patients having cardiac surgery are given a red blood cell transfusion after the operation, using up to ten per cent of the nation’s blood supply. The proportion of patients having a transfusion is high because blood loss and severe anaemia are common after cardiac surgery and transfusion is the preferred treatment. Blood loss causes anaemia which doctors detect by measuring haemoglobin levels – a low level triggers transfusion. The trial, funded by the National Institute for Health Research Health Technology Assessment Programme, compared two groups of patients, one which had transfusions at a low haemoglobin level and the other which had transfusions at a higher haemoglobin level.

Based on the overall pattern of findings the researchers, including Professor **Barnaby Reeves**, propose a new theory that a ‘high’ or liberal threshold is better after cardiac surgery. This challenges most prevailing guidelines and current health policy. The research showed that topping
up patients with modestly low blood counts may actually reduce deaths in the weeks following surgery.

- **Dr Anne-Marie O'Carroll** (PI) and Co-applicants Dr Stephen Lolait and Professor Julian Paton have been awarded a BHF Project Grant titled *Unravelling the role of the apelin-apelin receptor system in essential hypertension*. The sum of £225,955 has been awarded over three years.

- **Mr Marcus Drake** (PI) and Co-applicants Professor Chris Fry, Dr Tony Pickering and Professor Julian Paton have been jointly awarded an RO1 grant by the National Health Institute (USA) with the University of Pittsburgh. The project is entitled *PDE5 Inhibition of Afferents and Interstitial Cells in Overactive Mouse Bladders* and is for US$2.5M over five years.

- **Dr Martin Lewis** has been awarded a 3-year MRC clinical research training fellowship (~£226,000) to work with Professors Saadeh Suleiman & Clive Orchard on a project entitled *The Cardiac Role of the Exchange Protein Directly Activated by cAMP (Epac) During Postnatal Development*.

- **Professors Mark Cannell** and Jules Hancox, Dr Guillaume Chanoit and colleagues from Glasgow have been awarded an MRC programme grant for £1.45M for 5 years. The project is entitled *Relationship between early and late events in the cardiac cycle as control points for therapeutic intervention*.

- **Professor Costanza Emanueli** has been awarded a BHF Chair in Cardiovascular Science which will complement her 5-year BHF Programme Grant entitled *MicroRNAs in ischaemic heart disease and diabetes mellitus: from cardiac surgery to basic science (and back?)*. Ischaemic disease is one of the most serious medical challenges we face. Diabetes contributes to prevalence and severity of ischaemic disease through the acceleration of atherosclerosis increasing the risk of heart attacks, critical limb ischaemia and stroke. Additionally diabetics are at higher risk of complications such as acute kidney injury post cardiac surgery. Professor Emanueli’s proposed basic science research on microRNAs should eventually allow the development of therapeutic microRNA intervention in ischaemic heart disease associated with diabetes and the identification of biomarkers for use in cardiac surgery. Her ground-breaking research will advance this area of healthcare not only in the UK but worldwide.

**ANDREW HALESTRAP FMedSci**

Andrew Halestrap is formally retiring on 31 July 2015 but will continue to pursue his research interests well beyond that date. A special symposium is being held on 17 July 2015 at Wills Hall entitled “Advances in the Biochemistry of Ischaemia and Hypoxia” to celebrate his many important scientific contributions to which over 100 participants are expected.

I first met Andrew in 1970 when he was an undergraduate at the University of Cambridge and had applied to study for a PhD under my
supervision. I was immediately impressed with his enthusiasm and intelligence and was delighted when he accepted my offer of the studentship. In those days, he was a pipe-smoking, hirsute young man who loved fly-fishing and speeding around in a very rusty mini-van. He was a really hard-working and successful research student. Not only did his work show that insulin stimulated fatty acid synthesis through the activation of acetyl-CoA carboxylase but also he found a potent inhibitor of fatty acid synthesis (α-cyano-4-hydroxycinnamate) that he showed acted by blocking pyruvate transport into mitochondria (and hence demonstrated for the first time that a specific carrier for pyruvate existed in the inner membrane of mitochondria). After his PhD, he was awarded a Beit Memorial Fellowship to develop his studies of pyruvate and lactate transport across plasma and mitochondrial membranes. As described below, his early promise as a researcher of exceptional ability and brilliance has been fully realised. He was appointed to a Lectureship in the Department of Biochemistry in 1976 and promoted to Reader and Professor in 1988 and 1996 respectively. During the nearly 45 years he has been in the Department (now School) of Biochemistry, he has played a massive part in its development both as a teacher and researcher.

Most of his undergraduate teaching has been within the Biochemistry BSc course where he has been responsible for a large slice of the teaching of metabolism and some bioenergetics. He also oversaw the introduction of the Third Year options courses. His skill and dedication to teaching has always been much appreciated by the legions of students who have attended his various courses and he was awarded the Faculty Teaching Prize in 2008. He was Chairman of the Teaching Committee from 1995-2007 with a short break while he held a Wellcome Trust Research Leave Fellowship.

The research of Andrew Halestrap has been broadly in two fields of mammalian energy metabolism of major medical importance and he has become a world leader in both. One area, as mentioned above, followed his discovery of both the plasma membrane and mitochondrial monocarboxylate transporters that play pivotal roles in the metabolism of pyruvate, lactate and ketone bodies. He has led the field in elucidating the molecular identity, structure, role and regulation of these transporters and associated proteins. The second area has been a wide range of pioneering studies on the regulation of mitochondrial function in health and disease. In particular, his ground-breaking work, much with Elinor Griffiths, on the mechanism and role of the mitochondrial permeability transition pore have been instrumental in establishing the central role of mitochondria in cell death. His extensive collaborations with Saadeh Suleiman and Gianni Angelini have resulted in greater understanding of reperfusion injury in the heart and influenced clinical practice. His research is this area is also highly relevant to the understanding and treatment of a wide range of other clinical conditions including reperfusion injury in the brain, cancer, immune disorders and diabetes.

Often Andrew has been well ahead of his peers and the importance of his advances have not always been fully appreciated at the time. This sometimes resulted in difficulties in obtaining funding and publishing but Andrew never let these disappointments sap his enthusiasm and drive. A good example were his studies on liver mitochondria in the 1990s that suggested to him that metformin (the most widely prescribed drug used in the treatment of type 2 diabetes) might act by inhibiting the respiratory chain and his subsequent research showed clearly that it inhibited complex 1. However, this finding
was so surprising to reviewers that Andrew had tremendous difficulty getting the work published and even when it was published (in the *Biochemical Journal*) it was poorly cited for some five years. However, this paper has now been cited over 800 times and its yearly number of citations is over 100 and still increasing!

Overall, his published output has been truly impressive. He has published over 300 papers and reviews which have been cited in total more than 28,000 times (H-index 91). His yearly citations continue to increase and were over 2000 last year. Hardly the profile of the typical retiring biochemist! He was elected a Fellow of the Academy of Medical Sciences in 2008 and gave the Keilin Memorial Medal Lecture of The Biochemical Society in 2010.

I feel really lucky to have been his friend and colleague over the last 45 years. For the last five years I have joined his laboratory and it has been a real pleasure, allowing us to collaborate again after many years of following largely different research paths.

Andrew has two other dimensions to his busy life that are really important to him! He is a committed Christian (although always polite about accepting of my, and other colleagues, atheistic tendencies!). He was Churchwarden of the busy Christ Church Clifton for many years and is currently Chairman of Christians in Science. He is also a very family-orientated man. He married Margaret 40 years ago and they make a splendid partnership. They have had three children, now all married and with their own growing families. Andrew and Margaret have eight grandchildren to date. His “retirement” should allow him to spend more time with them!

Dick Denton
Professor Dick Denton, FMedSci, FRS, Emeritus Professor of Biochemistry and Senior University Research Fellow, School of Biochemistry

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**BCV LOGO COMPETITION**

Members of the community were invited to submit an individually designed logo which could be used for internal purposes on behalf of the Bristol CardioVascular Theme. A number of (anonymous) designs were tabled to the Theme’s Steering Group for consideration at their June meeting. A final design was approved and the winner, Professor Raimondo Ascione, received a bottle of wine and a certificate.
The logo, which will help towards forging a defined BCV identity, is available to download on the BCV intranet. Thanks are extended to all those who took part, and congratulations to the winner, whose work is reproduced above.

WHAT IS A HIT?

What is a HIT (Health Integration Team) and how do I become part of one?

HITs are the latest in a series of initiatives to bring together researchers, commissioners and service providers, and are run under Bristol Health Partners (a collaboration between four NHS Trusts, UoB, UWE and the local authority) with a remit that covers the south-west. A HIT should clearly focus on a gap in provision or healthcare pathway.

The benefit of being awarded a HIT is that there is some administrative support, protection of academic time and paying for public and patient time (PPI). Potential benefits arise when applying for external funding, with NIHR in particular looking favourably on a HIT as an excellent means of focussing the three different stakeholder groups. Some difficulties arise in evidencing the success rate for funding applications relative to the HIT and their subsequent outputs.

The process involves a two-stage application process: an outline proposal and then a more detailed full application which included justification of the project, methodology, type of intervention and service implementation over three years. The project requires a degree of patient-public involvement (PPI).

A successful HIT would need to target a very specific area where quality of service is lacking, with an evidence-based approach. Strong commitments for at least one year from an academic member of staff and a clinical collaborator are also required. Such teams are cross-organisational, interdisciplinary groups designed to harness strengths in research, innovation, education, patient care and prevention by working together in new and different ways. A cardiovascular HIT would be an important way to fulfil the translation potential and aspirations of Bristol Cardiovascular.

More information can be found on http://www.bristol.ac.uk/red/development/opportunities/hits.html.

Professor Robert Tulloh
Chair, Bristol Cardiovascular
ELIZABETH BLACKWELL INSTITUTE FUNDING SCHEMES

**EBI Research for Health challenge**
This scheme aims to encourage healthcare practitioners and University of Bristol researchers to work together to develop innovative thinking around clinical problems. The call for Health Challenges is now closed. The call for solutions opens 13 July 2015 and closes at 9am 12 October 2015.

**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.

**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 dependant. The deadline for applications is 30 April and 31 October each year.

FUNDING OPPORTUNITIES

A calendar of potential funding opportunities for CardioVascular Science has been set up via Research Professional. This calendar, which will automatically update with new opportunities as they arise, specifies title, submission deadline and links for each opportunity. This calendar is accessible via their website and will be updated automatically according to specified search criteria (cardiology, cardiovascular disease, myocardial infarction). Other subjects can be added by request- please email the theme with suggestions and/or comments.
**EPSRC funding changes**
The EPSRC have updated their on-going refresh of priority areas for Fellowships. For Healthcare Technologies please note the following expected calls: Fellowship call to be announced (August - September 2015); a pilot call for Healthcare Technologies Fellowships aligned to their recently published strategy (early and established career stage). To be removed, effective from 01-Oct-15 are: Regenerative Medicine (early and established career stage); Diagnostics (early and established career stage); Therapeutics (early and established career stage).

**British Heart Foundation**

**Senior Clinical Research Fellowships**
Provide a career opportunity in an established research institution in the UK for outstanding individuals who are expected to reach readership or chair level within 10 years in the field of cardiovascular research. Fellowships include salaries, research consumables and equipment. They initially last for five years with a renewal possible for a further five years. Up to one year of the award may be spent overseas.

Award amount: unspecified

Deadline: none

**British Heart Foundation**

**Career re-entry research fellowships**
Enable postdoctoral researchers to re-establish their careers in cardiovascular science in an established UK research institution, following a break of more than two years. Fellowships normally last for three years with the possibility of a one-year extension. Awards may include salaries, research consumables and equipment.

Award amount: unspecified

Deadline: none

**British Heart Foundation**

**Clinical Leave Research Fellowships**
Enable NHS staff to undertake dedicated PAs in research in a recognised UK centre of excellence in cardiovascular medicine. Clinical studies may also be supported. NHS consultants with recent research records are eligible to apply. Awards may be for up to one year full time or up to three years part time. They include reimbursement of reasonable costs to cover relinquished PAs, and research consumables.

Award amount: unspecified

Deadline: none

**British Heart Foundation**

**Intermediate Clinical Research Fellowships**
To provide a career opportunity in an established research institution in the UK for individuals with an established research record who intend to become leaders in academic medical research.

Award amount: unspecified

Deadline: none

**British Heart Foundation**

**MBPhD studentships**
Enable medical students to complete a PhD in cardiovascular science before completion of their medical degree. Studentships last two to three years according to the university's scheme. They cover a stipend, tuition fees and costs for research consumables, usually less than £10,000 per year.

Award amount: unspecified
Deadline: none

**British Heart Foundation**

**Project grants**
Support short-term research projects lasting up to three years and costing less than £300,000. Grants may cover salaries, research consumables and equipment.

Award amount: £299,999
Deadline: none

**British Heart Foundation**

**Advanced Training Awards**
To provide researchers within one to three years of submitting a PhD with an opportunity to re-train and gain additional expertise in an established research institution in the UK.

Award amount: £30,000
Deadline: none

**British Heart Foundation**

**Senior Basic Science Research Fellowship**
To provide a career opportunity in an established research institution in the UK for outstanding individuals who are expected to reach Readership or Chair level within five years.

Award amount: unspecified
Deadline: none

**Wellcome Trust**

**Four-year PhD studentship programmes**
Enables students to undertake in-depth postgraduate training at centres of excellence throughout the UK in the following biomedical research areas: developmental biology and cell biology; molecular and cellular biology; physiological sciences; structural biology and bioinformatics. The first year combines taught courses with laboratory rotations to broaden the student's knowledge of the subject area. At the end of the first year, students make an informed choice of their three-year PhD research project. Studentships include a stipend, PhD registration fees at UK or EU student rate, laboratory rotation expenses in the first year, research expenses for years two to four, travel and transferable-skills training.

Award amount: unspecified
Deadline: none

**GW4**

**Initiator Fund** - for workshops, sandpits or other community building or collaborative activities. This can be used as a stand-alone award or could be a step towards other funding sources.
**Accelerator Fund** - for collaborative pump priming activities which will normally position the community to win major external funding and/or measures of academic esteem. Applicants for the Accelerator Fund will either have successfully completed the Initiator stage or provided evidence of recent activities that have enabled the scoping of research ideas to a level appropriate for direct submission to the Accelerator Fund.

A GW4 research community should involve at least three GW4 institutions, with communities involving all four partners preferred. Where less than four are involved this will need to be justified. Each application will need to articulate the added value of working across GW4.

Award amount: unspecified  
Deadline: 31-Jul-15

**Vasculitis Foundation Research Programme**

Aims to provide seed grants to support pilot studies that research the following areas: aetiology or pathogenesis, including a broad range of studies of immunity, inflammation or vascular biology; epidemiology, including genetics; diagnosis, including identification of disease subtypes; treatment and management, including therapeutics to treat vasculitis or prevent complications, biomarkers and psychosocial outcomes. The goal of the programme is to improve the quality of life for patients with vasculitis and find the case and cure for vasculitis.

Award amount: US$100,000  
Deadline: 03-Aug-15

**European Research Council**

**ERC Starting Grant**

Intended to enable exceptional researchers between 2 and 7 years from PhD completion to become independent research leaders and strengthen their own research team or programme.

In order to maximise chances of success, proposals to the call will be handled though the University’s major bids process. Applicants are required to complete a brief University stage application form for internal review, available on

Award amount: €1.5M  
Internal Deadline: 18-Aug-15

**Bayer**

**Grants for targets**

The initiative aims to encourage research on novel targets and disease-related biomarkers in the fields of oncology, gynecology, cardiology, hematology and ophthalmology. The following different types of grants, depending on the specifics of the target and its development phase will be awarded: support grants worth between €5,000 and €10,000 will be awarded to advance research on targets that are at a very early stage of discovery; focus grants worth between €10,000 and €125,000 will be awarded for more mature ideas, such as addressing specific aspects of a target as a first step towards
transferring it to the drug discovery process. Researchers from universities, other academic research institutes and start-up companies from all over the world are welcome to apply.

Award amount: €125,000  Deadline: 31-Aug-15

**Fondation Leducq**

Transatlantic networks of excellence
Funding supports collaborative research coordinated by centres in North America and Europe in the areas of cardiovascular and neurovascular disease. Each application must involve a North America-based and a Europe-based co-ordinator. Investigators worldwide may participate in the network.

Award amount: US$6M  Deadline: 06-Sep-15

**National Fund for Scientific Research - Fonds de la Recherche Scientifique**

InBev-Baillet Latour health prize
Recognises achievements in biomedical research for the benefit of human health and encourages the laureate in the pursuit of his or her career. Scientists of any nationality who have not previously received an equivalent or higher prize for their personal use may be nominated. The candidate must be nominated by a person who is qualified to assess the nominee’s work.

Award amount: €250,000  Deadline: 15-Sep-15

**Medical Research Council**

Population and Systems Medicine
Suitable for focused research projects that may be short- or long-term in nature. In addition, they can be used to support method development and continuation of research facilities and may involve more than one research group or institution.

Award amount: £1,000,000  Deadline: 30-Sep-15

**Medical Research Council**

New Investigator Research Grant- Population and Systems Medicine
Provide support for clinical and non-clinical researchers while they are establishing themselves as independent principal investigators. For those who already have an institutional post, it provides funding and protected time with which to establish an independent research career. The grant is also a potential source of research funding for fellows whose awards only cover a personal salary or limited research funds.

Award amount: not specified  Deadline: 30-Sep-15

**Medical Research Council**

Partnership Grant
Provides core funds to support partnerships between diverse groupings of researchers, and can be used for infrastructure support, platform activities and for bringing together managed consortia or multidisciplinary collaborations.
European Society of Cardiology

**EACVI research grants**

Support specialised research in the field of non-invasive modalities in order to help young candidates obtain research experience in a high standard academic centre in an ESC member country other than their own.

Award amount: €25,000  
Deadline: 30-Sep-15

UHBristol

**Small grants scheme**

Research Capability Funding is designed to lead on to future NIHR applications. Above and Beyond funding can be earlier stage more translational research, though should (eventually) be of benefit to UHBristol patients. They are open to university-based researchers, as long as they collaborate with a UHBristol employee, or have an honorary contract with UHBristol.

Award amount: €250,000  
Deadline: Oct-15 (exact date tbc)

Heart Research UK

**Novel and Emerging Technologies Grant**

Supports research on novel and emerging technologies and their application to cardiovascular disease prevention and treatment. The grant may support approaches including tissue and bioengineering, development of new therapeutic devices, bioimaging, nanotechnology, biomaterials, genomic and proteomic approaches, computational biology and bioinformatics. Emerging technologies or strategies in the management of risk factors or evaluation of invasive or surgical procedures or similar may also be supported.

Award amount: £250,000  
Deadline: 01-Oct-15

Innovative Medicines Initiative Joint Undertaking

**H2020-JTI-IMI2-2015-05-two-stage IMI2 fifth call for proposals**

Supports prospective, pre-competitive pharmaceutical research and development projects. The following topics are supported:

- IMI-2015-05-01 patient perspective elicitation on benefits and risks of medicinal products, from development through the entire life cycle, to inform the decision-making process by regulators and health technology assessment bodies
- IMI-2015-05-02 diabetic kidney disease biomarkers
- IMI-2015-05-03 inflammation and AD: modulating microglia function – focussing on TREM2 and CD33
Proposals must take the form of research and innovation actions. Research and innovation actions require participation by at least three legal entities, each established in a different EU member state or associated country. The budget for this call is worth €47.48 million from the IMI2 JU, and a similar amount is matched from EFPIA companies and associated partners.

Award amount: €€€    Deadline: 13-Oct-15

**Royal Society**

**Research Professorships**

Enable world-class scientists to be relieved from teaching and administration duties in order to focus on research. Research in any of the natural and applied sciences, including medical science, engineering and interdisciplinary research, may be supported.

Award Amount: £1.1M    Deadline: 03-Nov-15

**Fulbright Commission**

**British Heart Foundation scholar award**

Enables a UK academic or professional to pursue laboratory-based research into the biomedical or clinical aspects of cardiovascular disease at any accredited higher education institution in the US. Research projects must not involve direct clinical contact with patients.

Award Amount: unspecified    Deadline: 06-Nov-15

**Belgian Society of Cardiology**

**Doctor Léon Dumont prize**

Recognises a European researcher in cardiovascular medicine. Applicants must be actively engaged in research and must be no more than 50 years old on 31 December 2015. The award money must be used to further the winner’s research programme.

Award amount: €40,000    Deadline: 11-Nov-15

**European Society of Cardiology**

**Atherothrombosis research grants**

Enable young candidates to gain research experience in the field of atherothrombosis at a high standard academic centre in an ESC regular member country. Proposals may be submitted for specialised research or further research training or, in case of medical graduates, for training in a basic subject. Applicants must be citizens or permanent residents of an ESC regular member country and under 36 years of age.

Award amount: €50,000    Deadline: 15-Jan-16

**Royal Society of Medicine**

**Venous pump priming grant**

Supports research that benefits the phlebology and endovenous fields. Trainee specialists under 40 years of age at the time of application may apply. Applicants must include a letter from their head of
department, or senior colleague or specialist, supporting the application. The winner is expected to present their work in a 10-minute presentation at the society’s spring meeting.

Award amount: unspecified     Deadline: 25-May-16

THIS MONTH’S SHOWCASED ARTICLE

Differences in the profile of protection afforded by TRO40303 and mild hypothermia in models of cardiac ischemia/reperfusion injury


A recent highlight of one of the many papers published by Andrew Halestrap and colleagues.

Effects of TRO40303, MitoQ and mild hypothermia on mPTP opening, reactive oxygen species production and cell death in isolated adult rat cardiomyocytes submitted to in vitro ischemia/reperfusion. Cardiomyocytes were subjected to 2 h hypoxia followed by 2 h reoxygenation. TRO40303 (3 µM) or its vehicle was added 15 min before reoxygenation and maintained during the first 10 min of reoxygenation. MitoQ (0.2 µM) or its vehicle was added 30 min before hypoxia. Moderate hypothermia (32 °C) was induced 1 h after the beginning of the hypoxic period and was maintained during hypoxia and the first 30 min of reperfusion. The cells were co-loaded with calcein (1 µM), CoCl2 (1 mM) and propidium iodide (5 μM) to assess mPTP opening (A) and cell death (B) or with MitoSox (1 µM) to assess reactive oxygen species production (C). Images were collected as described in Section 2. For each experiment, the initial fluorescence intensities measured in single cardiomyocytes were normalized to initial value for calcein and MitoSox or final value for propidium iodide and the global response was calculated by averaging traces obtained from all the cardiomyocytes. Each value represents the mean±S.E.M. of n independent experiments each from a new culture preparation. Statistical analysis was performed by one-way ANOVA followed by Dunnett’s post-test: ***P<0.001 versus control.

The mode of protection against cardiac reperfusion injury by mild hypothermia and TRO40303 was investigated in various experimental models and compared to MitoQ in vitro.
In isolated cardiomyocytes subjected to hypoxia/reoxygenation, TRO40303, MitoQ and mild hypothermia delayed mPTP opening, inhibited generation of mitochondrial superoxide anions at reoxygenation and improved cell survival. Mild hypothermia, but not MitoQ and TRO40303, provided protection in a metabolic starvation model in H9c2 cells and preserved respiratory function in isolated rat heart mitochondria submitted to anoxia/reoxygenation. In the Langendorff-perfused rat heart, only mild hypothermia provided protection of hemodynamic function and reduced infarct size following ischemia/reperfusion. In biopsies from the left ventricle of pigs subjected to in vivo occlusion/reperfusion, TRO40303 specifically preserved respiratory functions in the peri-infarct zone whereas mild hypothermia preserved both the ischemic core area and the peri-infarct zones. Additionally in this pig model, only hypothermia reduced infarct size.

We conclude that mild hypothermia provided protection in all models by reducing the detrimental effects of ischemia, and when initiated before occlusion, reduced subsequent reperfusion damage leading to a smaller infarct. By contrast, although TRO40303 provided similar protection to MitoQ in vitro and offered specific protection against some aspects of reperfusion injury in vivo, this was insufficient to reduce infarct size.

**PUBLICATIONS**


Image caption: Regional sampling from cMRI. Panel A shows a typical heart short axis view of a patient with idiopathic dilated cardiomyopathy, the tagging marks are fitted by a model computer grid whose dimensions during the contraction/relaxation cycle give regional circumferential contraction (%C.).

Image caption: Effects of CAL on cardiac and myocyte morphology. Confocal images of mid-section slices from representative Sham (left) and CAL (right) myocytes stained with di-8-ANEPPS; scale bar 20 μm.


Image caption: Identification of joint roles of the 7/8 loop and double calcium ion binding site in the L-lectin domain of TSP1 in ECM incorporation of mRFPovTSP1C. B: structure of the L-type lectin domain of TSP1 from PDB25 1UX6. The ECM incorporation activity site includes the DDD motif and 7/8 loop and is at the outer tip of the domain, remote from the RGD motif that is in the last type 3 repeat.


regulates protein sorting into and maturation of α-granule progenitor organelles in mouse megakaryocytes. *Blood*. 126(2).

Image caption: Characterisation of the Vps33bfl/fl-ERT2 mice. Extramedullary hematopoiesis in Vps33bfl/fl-ERT2 mice. Representative images of hematoxylin and eosin-stained spleen (top panels) and femur BM (bottom panels) sections from littermate controls (left top and bottom panels) and Vps33bfl/fl-ERT2 mice (right top and bottom panels). MKs are indicated by yellow arrowheads (n = 3 mice per genotype). Bright field images were obtained using a Zeiss Axiovert 200 inverted high-end microscope with a 20× objective. Scale bar, 50 μm.


Image caption: The distribution of Slc12a1 mRNA in the PVN of a dehydrated rat. Representative photomicrographs showing the distribution of Slc12a1 mRNA in the PVN of a dehydrated rat as demonstrated by in situ hybridization histochemistry. A, Prominent labeling was observed in the magnocellular compartment of the PVN while lower expression was detected in the parvocellular regions. The pattern of distribution can be clearly observed in B. Higher power photomicrographs of the magnocellular and parvocellular subdivisions are shown in C and D, respectively (indicated by the dashed boxes in B). The arrows point to cells expressing the Slc12a1 transcript, where magnocellular neurons show much higher levels of expression. Scale bars: A, B, 100 μm; C, D, 50 μm. PaLM, paraventricular nucleus of the hypothalamus, lateral magnocellular part; PaMP, medial parvocellular part; PaV, ventral parvocellular part.


**CONTACTS**

- Catherine Brown - Research Development Administrator for the Biomedical Research Themes
- Collette Sheahan - Research Development Associate

**Steering Group:**

**Chair:** Robert Tulloh  
Honorary Professor of Clinical Sciences

- Professor Clive Orchard *Cardiac Biology*  
- Professor Raimondo Ascione *Cardiac Surgery*  
- Dr Chiara Bucciarelli-Ducci *Imaging*  
- Dr Carmen Coxon *Early Career Representative*  
- Professor Ian Day *Population Health and Epidemiology*  
- Professor Costanza Emanueli *Cardiovascular Regeneration*  
- Dr Andrews James *Cardiac Biology*  
- Dr Thomas Johnson *Cardiology*  
- Dr Simon Satchell *Renal, Diabetic & Hypertensive Disease*  
- Professor Saadeh Suleiman *Cardiac Biology*