2014 has been an important year for the Institute of Cardiovascular and Medical Sciences (ICAMS). We successfully returned 58 staff in the REF; our research income grew by 13.7% and we initiated a new Masters programme in Diabetes. We welcomed 56 new members of staff and graduated 93 MSc, 7 MD, and 22 PhD Students. Moreover, the BHF Award of Excellence was initiated, as highlighted in this report.

While there have been many successes and achievements in our research and academic contributions, this has also been a year of reflection in terms of moving forward. To this end, ICAMS underwent a rigorous review by an external scientific advisory board (Appendix 4.1), chaired by Professor Victor Dzau, President of the Institute of Medicine of the National Academy of Sciences, USA. The Board recognized and praised the tremendous strengths and areas of excellence in ICAMS, but also identified some challenges and weaknesses. These have been highlighted in a detailed report from the Board, which has been used as a basis for the new strategic planning for the next 5 years.

I would like to thank the ICAMS Leadership for helping develop the new 2015-2020 plan (Appendix 4.8). As evidenced in the new strategic document, the previous management and operational structure will be dissolved, to be replaced with the new structures. I would like to take this opportunity of thanking all members of the previous ICAMS management committee and the Chairs of research themes for their hard work and efforts over the past few years.

This is an exciting time for ICAMS as we move forward to greater successes, grander science, growing student numbers and more academic and scholarly contributions. I look forward to working with you all to achieve these goals and to making our vision a reality.

Professor Rhian Touyz
Director of the Institute of Cardiovascular & Medical Sciences
## Research Themes

### Vascular and Cerebrovascular Pathophysiology & Therapy (VPT)

**Theme Leaders:** Dr Tim Palmer & Dr Stuart Nicklin  
**Theme Members:** Prof Andy Baker, Prof Colin Berry, Dr Ange Bradshaw, Dr Christian Delles, Dr Laura Denby, Dr Marie-Ann Ewart, Dr Dilysh Freeman, Dr Delwyn Graham, Prof Tom Guzik, Dr Scott Johnstone, Dr Simon Kennedy, Prof Mandy MacLean, Dr Robert McDonald, Dr Marco Meloni, Dr John Mercer, Dr Ashley Miller, Dr Guto Montezano, Dr Jo Mountford, Dr Aurelie Nguyen Dinh Cat, Prof Andrew Peacock, Dr Ian Salt, Prof Rhian Touyz, Dr Tom Van Agtmael, Dr David Welsh, Dr Lorraine Work  
**Theme Support:** Miss Marion Howat

### Cardiac Biology, Physiology & Clinical Cardiology (HEART)

**Theme Leaders:** Prof Colin Berry & Dr Antony Workman  
**Theme Members:** Prof Nawwar Al-Attar, Dr George Bailie, Dr Francis Burton, Dr Derek Connelly, Dr Margaret-Ann Craig, Mr Mark Danton, Michael Dunne, Dr John Foster, Dr Anne French, Dr Hao Gao, Catherine Harkesby, Dr Pardeep Jhund, Mr Saleem Haj-Yahia, Dr Ole Kemi, Dr Sarah Kettlewell, Dr Christopher Loughrey, Prof Fiona Lyall, Prof Peter Macfarlane, Dr Niall MacQuaide, Ms Christine McComb, Dr Rachel Myles, Dr Stuart Nicklin, Prof Keith Oldroyd, Dr Mark Petrie, Dr Maria Pura, Dr Alexandra Radjenovic, Aileen Rankin, Prof Godfrey Smith, Dr Niko Tzemos  
**Theme Support:** Miss Alison Reid

### Diabetes, Endocrinology, Metabolic & Renal Disease (DREAM)

**Theme Leaders:** Prof John Petrie, Prof Naveed Sattar & Dr Jason Gill  
**Theme Members:** Prof Faisal Ahmed, Dr Mark Bailey, Dr David Cart, Prof Muriel Caslake, Dr Gemma Currie, Prof Eleanor Davies, Dr Christian Delles, Prof Miles Fisher, Dr Marie Free, Dr Dilysh Freeman, Dr Nazim Ghouri, Prof Alan Jardine, Prof Mike Lean, Dr Robert Lindsay, Dr Jennifer Logue, Prof Gordon Lowe, Dr Patrick Mark, Dr Guto Montezano, Dr Colin Perry, Dr David Preiss, Dr Chris Sainsbury, Dr Ian Salt, Dr Paul Welsh  
**Theme Support:** Miss Bryonie Hammick

### Genetics, Genomics, & Systems Medicine (GGSM)

**Theme Leaders:** Dr Christian Delles, Prof Harald Mischak & Dr Sandosh Padmanabhan  
**Theme Members:** Dr Mark Bailey, Prof Eleanor Davies, Dr Jesse Dawson, Dr Laura Denby, Prof Anna Dominiczak, Prof Eyal Gottlieb, Dr Delwyn Graham, Dr Pawel Herzyk, Dr Holger Husi, Dr Wai Kwong Lee, Dr Scott MacKenzie, Dr Martin McBride, Dr John McClure, Dr Bill Mullen, Dr Scott Robinson, Dr Lorraine Work  
**Theme Support:** Ms Dorothy Ronney

### Clinical Trials and Implementation (CTIMP)

**Theme Leaders:** Prof Kennedy Lees & Prof John McMurray  
**Theme Members:** Prof Colin Berry, Dr Jesse Dawson, Dr Marie Free, Prof Alan Jardine, Dr Pardeep Jhund, Prof John Petrie, Dr Mark Petrie, Prof Peter Langhorne, Dr Robert Lindsay, Dr Jennifer Logue, Prof Peter Macfarlane, Dr Paddy Mark, Prof Keith Oldroyd, Dr David Preiss, Dr Terry Quinn, Prof Naveed Sattar, Prof David Stott, Prof Matthew Walters  
**Theme Support:** Miss Lyndsey Macdonald
Members of the Institute Executive Group

Prof Rhian Touyz
Chair, Director of Institute, Institute Management Group Member

Prof Andy Baker
Deputy Director of Institute, Institute Management Group Member

Prof Godfrey Smith
Research Convenor & REF Champion, Institute Management Group Member

Prof Matthew Walters
Convenor for Undergraduate Education & School of Medicine Representative, Institute Management Group Member

Members of the Institute Management Group

Dr Stuart Nicklin
Deputy Convenor for Undergraduate Education & Research Theme Leader (VPT)

Dr Marie Freel
Deputy Convenor for Postgraduate Education

Prof Mandy MacLean
School of Life Sciences Representative

Prof Peter Langhorne
NHS Liaison

Dr Jason Gill
Research Theme Leader (DREAM)

Dr Christian Delles
Research Theme Leader (GGSM)

Prof Harald Mischak
Research Theme Leader (GGSM)

Dr Sandosh Padmanabhan
Research Theme Leader (GGSM)

Dr Dilys Freeman

Prof Alan Jardine

Dr Jennifer Logue

Dr Paddy Mark
Prof Colin Berry  
NHS Liaison & Research Theme Leader (Heart)

Dr Antony Workman  
Research Theme Leader (Heart)

Prof Naveed Sattar  
Research Theme Leader (DREAM)

Prof John Petrie  
Research Theme Leader (DREAM)

Dr Yannis Pitsiladis  
Research Theme Leader (GGSM)

Prof Kennedy Lees  
Research Theme Leader (CTIMP)

Dr Tim Palmer  
Research Theme Leader (VPT)

Dr Chris Loughrey  
Internationalisation

Dr David Preiss

Dr Tom Van Agtmael

Dr Jesse Dawson

Prof Tomasz Guzik

Prof George Baillie

Dr Aleksandra Radjenovic

Dr John Mercer

Ms Jillian Blair MBA  
Head of Research Administration, Institute Management Group Member

Prof Eleanor Davies  
Convenor for Postgraduate Education, Institute Management Group Member

Prof John McMurray  
Clinical Research Convenor & Research Theme Leader (CTIMP), Institute Management Group Member

Mrs Sandra MacDonald  
Clerk, Research Administrator, Institute Management Group Member

Prof George Baillie
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1. General Knowledge

1.1 Funding

In 2014, the Institute of Cardiovascular and Medical Sciences held 511 active research grants or contracts, with a total value to the Institute of £53.9 million.

The top five funders, by value, of active projects were:
- British Heart Foundation (88 projects totalling £15.5 million)
- European Commission (45 projects totalling £8.3 million)
- Medical Research Council (50 projects totalling £7.8 million)
- National Institute for Health Research (17 projects totalling £3.6 million)
- Wellcome Trust (39 projects totalling £1.9 million)

During 2014, the Institute was awarded 198 new projects, with £13.3 million coming to the Institute.

The largest funders for new awards, by value, were:
- British Heart Foundation (£2.8 million)
- European Research Council (£1.9 million)
- Medical Research Council (£1.3 million)
- Wellcome Trust (£1.3 million)
- European Commission (£0.7 million)

Appendix 4.3 contains a list of new grants awarded in 2014 on which Institute members were investigators. The funding stated is the amount that has come to the University of Glasgow which, for some grants, may be less than the total amount awarded. The list does not include any grants which are confidential in nature.

Active Grants: 1st January – 31st December 2014 (proportioned value)

- Overseas Other 7%
- EU 24%
- UK Industry 2%
- UK Government 6%
- Research Councils 10%
- 51% UK Charities

British Heart Foundation Centre of Excellence

Since 2008, the British Heart Foundation has been investing in centres of excellence, which gather leading scientists together who conduct ground-breaking research projects with the aim of conquering heart disease. The main objectives of the centres of excellence are:

- To jump-start innovative research projects and support inspirational ideas
- To seek out and train the very best young doctors and scientists to become the next generation of heart researchers
- To foster pioneering research partnerships between heart scientists and other specialists, such as engineers and mathematicians, to gain brand new insight and ideas to tackle heart disease.
Excellence Award for ICAMS

In 2012, with further investment from the BHF, the scheme was renewed and a second call was put out for proposals. Of the 14 applications submitted to the BHF, 6 awards were given with Glasgow joining Oxford, Cambridge, Kings, Imperial and Edinburgh as the successful awardees.

ICAMS was awarded a £3M research grant for 5 years. In itself the BHF Excellence Award represents an outstanding achievement, which recognises the calibre of expertise in pioneering cardiovascular research here at ICAMS.

The award was initiated in April 2014 and is now in full swing.

Scientific Strategy and Plan

The overall scientific strategy of the Excellence Award at ICAMS focuses on vascular dysfunction as a root cause of cardiovascular disease (CVD). The award is known as the ‘BHF Centre for Excellence in Vascular Science and Medicine’. By combining cell-based systems, experimental models, patient cohorts, datasets and biobanks, with a focus on dissecting the intrinsic disease axes at the vascular level, research in the Centre of Excellence will lead to new mechanistic insights and approaches in predicting, diagnosing and treating CVD and target-organ damage. Elucidating mechanism-based therapeutic targets together with vascular phenotyping will provide a diagnostic/therapeutic platform for individualised risk stratification for personalised treatment, the future of medicine. Findings will be translated into measurable outcomes through our translational programme, first-in-man trials and renowned clinical trials expertise.

Scientific frameworks

The strategy for the science undertaken in the Centre of Excellence includes 5 integrated frameworks as shown in the figure below.

![Scientific frameworks diagram](image-url)
Research Axes

Under the umbrella of the strategic priority, there are 3 research axes:
1. Immune dysregulation in vascular disease
2. Redox biology of small vessel disease
3. Early onset vascular disease and socioeconomic status

Training

A priority of the ICAMS award is the creation of 2 new fully funded training programmes:
1) PhD in vascular biomedicine for clinicians (3-year PhD),
2) Clinical Observership Programme in vascular medicine for basic scientists (5 week clinical rotation/observership for post-doctoral fellows).

New resources for ICAMS researchers – Core facilities

The award provides opportunities for the creation of 3 Core facilities in ICAMS by supporting highly skilled personnel to run these facilities. Research Cores will make available services of excellence to all our researchers in ICAMS. Shared interdisciplinary Core facilities will provide cutting-edge technology, protocols and expertise, crucial to the promotion of science. In addition, these Cores will constitute a major training resource and also provide opportunities for new research. Infrastructure at ICAMS will be reorganised into 3 discrete facilities:
1) Vascular Core of myography and imaging;
2) Clinical vascular phenotyping Core in collaboration with the NHS Clinical Research Facility; and
3) Clinical Trials Core

Who is involved?

BHF Professor Rhian Touyz, Director of ICAMS, is the Principal Investigator and Award Director of the Excellence Award, working closely together with 12 senior co-investigators from multi-disciplinary backgrounds in order to implement the programme.

Why we applied and what the award means to ICAMS

Chronic diseases challenging our society e.g. heart failure; stroke, vascular dementia and coronary artery disease (CAD) are linked to a common factor, namely vascular dysfunction. The impact of diseases associated with aberrant vascular function is enormous, affecting >20 million individuals in the UK. This will grow as our population ages and as the prevalence of conditions causing vascular damage (obesity, dyslipidaemia, diabetes, hypertension (HT)) increases. Hence there is an urgent need to better understand the biology of the vasculature in health and disease.

Considering the scientific strengths and strategic priority related to vascular research in ICAMS, we believe that Glasgow is well positioned to lead the way in unravelling the vascular (patho)biology in health and disease. The Award of Excellence provides opportunities to bring together outstanding researchers across multiple disciplines in MVLS, including immunology, inflammation, signalling, cell biology and cardiovascular science and medicine, to study vascular dysfunction as a root cause of chronic cardiovascular disease.
How will the £3M be used?

The award will support:
1) Pump priming for innovative projects in the 3 Research Axes. This will provide leverage for full proposals and new research funds.
2) Two highly skilled personnel to lead 2 of the 3 Cores.
3) Support new training programmes (PhD for clinicians 2-3/ year; clinical rotations for post-docs in basic science 5 week cycle).
4) Advancing knowledge in vascular biology and biomedicine through seminars, workshops and summer schools for trainees, researchers, clinicians, technicians.

How is the Excellence Award managed?

Professor Touyz is Director of the Excellence Award at ICAMS and leads the scientific direction, maintaining an oversight of the achievements and challenges presented as this work progresses. Under her supervision, a Management Board has been nominated and appointed, tasked with approving plans, milestones, project content and processes as well as having an advisory role.

For each of the 3 main research axes within the Excellence Award, a Project Leader has been appointed, as follows:
1) Redox biology for small vessel disease
   – Professor Rhian Touyz
2) Immune dysregulation in vascular disease
   – led by Professor Tom Guzik
3) Early onset vascular disease & socioeconomic factors
   – led by Professor Naveed Sattar

When was the award initiated?

The award became active in April 2014. 2014 saw the Centre develop rapidly and implement its 3 main areas of research; projects within these key research axes have started under expert leadership and the projects continue to make excellent progress. Specific progress and activities within the Centre of Excellence’s remit in its first 9 months of operation are listed below.

Activities to date:
• Mrs Karen Trofimova has been appointed as Project Manager for the Excellence Award, tasked with managing the day-to-day operations and administration, coordination of trainee activities and communications.
• Some new infrastructure for the Vascular phenotyping and Vascular Cores has been purchased. A SphygmoCor EXCEL has been purchased as well as a new objective for the confocal microscope.
• The Centre of Excellence recruited a part-time Clinical Trials Manager towards the end of 2014 and the recruitment process is underway for the planned recruitment of an Imaging/Myography Core Leader and the 2015 intake of Clinical Research Fellows.
• The first call for the Clinical Observership Programme aimed at ICAMS’ post-docs has been circulated, a group of 4 post-docs have been selected and will embark on the programme in early 2015. This is an extremely exciting and prestigious opportunity for the researchers and will very much have a translational focus.
• Research projects within the 3 Research Axes are currently being developed and the research project groups are meeting regularly to continue to make excellent progress with their work.
How do I keep informed of activities related to the Excellence Award?

The Excellence Award at ICAMS has a dedicated website on the current ICAMs web pages. This can be accessed using the following url: www.gla.ac.uk/researchinstitutes/icams/bhfcoeglasgow. Quarterly newsletters are issued to keep everyone up-to-date on the activities and achievements of the Centre of Excellence. Additionally, the Centre of Excellence has a growing social media presence between its own Facebook Page and Twitter Account.

Facebook: www.facebook.com/bhfexcellenceglasgow
Twitter: https://twitter.com/BHFCoEgGlasgow

The key contact person at ICAMS for enquiries and information regarding the Excellence Award is:

Mrs Karen Trofimova
Email: karen.trofimova@glasgow.ac.uk
Tel: 0141 330 8049

Links to other Centres of Excellence

The University of Glasgow (ICAMS) joins 5 other Centres of Excellence around the UK.

- Imperial College London
  - led by Professor Michael Schneider
- King’s College London
  - led by Professor Mathias Gautel
- University of Edinburgh
  - led by Professor Keith Fox and Professor Dave Newby
- University of Oxford
  - led by BHF Professor Sir Rory Collins
- University of Cambridge
  - led by Professor Nick Morrell

Links to and Partnerships with other Vascular Centres of Excellence

The BHF Centre of Excellence in Vascular Science and Medicine is now linked to a number of other key vascular organisations in Europe and North America. These established links provide us the opportunity for collaboration on a scientific level, event organisation, sharing of each others’ vacancies and other opportunities, co-promotion and much more.

- Canadian Vascular Network
- North American Vascular Biology Organisation
- European Vascular Biology Organisation
- British Society for Cardiovascular Research
- International Society of Hypertension
- British Hypertension Society
- British Cardiovascular Society
- European Society of Cardiology

1.2 Publications

Members of the Institute of Cardiovascular & Medical Sciences published a total of 422 manuscripts and 24 books or book chapters during 2014. The full list of publications is contained in Appendix 4.4.

176 papers were published in journals with an impact factor of 5 or greater. 54 of those manuscripts had an impact factor of 10 or greater which included: two in the New England Journal of Medicine (IF 55.87), two in Lancet (IF 45.22), one in Nature (IF 41.46), one in JAMA-Journal of the American Medical Association (IF 35.29), one in Nature Methods (IF 32.07), two in Nature Genetics (IF 29.35), five in BMJ-British Medical Journal (IF 17.45), one in Pharmacological Reviews (IF 17.1), seven in the Journal of the American College of Cardiology (IF 16.5), one in Science Translational Medicine (IF 15.84), ten in the European Heart Journal (IF 15.2), one in Gut (IF 14.66), one in Molecular Psychiatry (IF 14.5), four in Circulation (IF 14.43), three in PLOS Medicine (IF 14.43), one in the American Journal of Respiratory and Critical Care Medicine (IF 13), two in Nature Communications (IF 11.47), three in Circulation Research (IF 11.02), one in the American Journal of Human Genetics (IF 10.93), one in the American Journal of Gastroenterology (IF 10.76), one in EMBO Journal (IF 10.43), and three in the Annals of the Rheumatic Diseases (IF 10.38).
2. Sharing Knowledge

2.1 Global partnerships

The Institute of Cardiovascular & Medical Sciences strives to achieve a global impact in terms of cutting edge cardiovascular science and state-of-the art medicine. In order to realise this goal, we share knowledge through collaborations with academics and partners in 33 countries across the world:

Australia, Austria, Belgium, Brazil, Canada, China, Denmark, Finland, France, Germany, Greece, Hungary, India, Ireland, Israel, Italy, Japan, Kenya, Korea, Macedonia, Malaysia, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Singapore, Spain, Sweden, Switzerland, UK, USA.
2.2 Investing in the future

The Institute of Cardiovascular and Medical Sciences is committed to training the leaders of the future by providing supervision of postgraduate research students, postgraduate taught courses and support and mentorship to early career researchers.

2.3 Postgraduate Research

The Institute provides a vibrant and supportive environment for postgraduate research students, who come from a wide variety of professional backgrounds and disciplines. In 2014, there were 134 postgraduate research students registered in the Institute of Cardiovascular and Medical Sciences: 112 students were studying for Doctorate of Philosophy (PhD) (Appendix 4.6), 22 for Doctorate of Medicine (MD) (Appendix 4.7).

During 2014, 29 students were awarded doctorates: 22 PhD, 7 MD

Doctorate of Philosophy (PhD)

Ashleigh Byrne, “Functional characterisation of phosphodiesterase 4D7 in prostate cancer”

Louise Diver, “Mechanisms of increased arrhythmogenic risk associated with acute regional ischaemia in rabbit: An optical mapping study”

Jerome Durussel, “A novel transcriptomic based approach to the detection of recombinant human erythropoietin doping”

Rachel Fulton, “Exploratory analyses to guide inclusion, limitation of sample size and strengthening of endpoints in clinical stroke trials”

Lesley Graham, “Characterisation of uromodulin as a candidate gene for human essential hypertension”

Jenny Grant, “The role of microRNA in the development of pulmonary hypertension: Studies in cell culture and animal models”
Doctorate of Philosophy (PhD)

Anne Johansen, “Estrogen metabolism in pulmonary arterial hypertension"

Sarah Mancini, “Regulation of inflammatory signalling in adipocytes by AMPK"

Charlotte McCarroll, “The effects of trypanosome brucei and Mammalian-derived extracellular cathepsin-L on myocardial function”

Clare McKinney, “The role of angiotensin (1-7) and angiotensin (1-9) in vascular remodelling”

Aiste Monkeviciute, “Analysis of microRNA role in the development of left ventricular hypertrophy in the stroke prone spontaneously hypertensive rat”

Lydia Murray, “Dissecting the mechanism of disease of COL4A1 and COL4A2 mutations”

Erin Olson, “Characterization of the Gstm1 transgenic SHRSP rat”

Christopher Onyiaodike, “A study of metabolic and inflammatory pathways throughout gestation”

Hollie Robinson, “Investigation of the role of microRNA-143 in acute vascular injury”

Rosazra Roslan, “Mechanisms of increased arrhythmogenic risk associated with acute regional ischaemia in rabbit: An optical mapping study”

Kathryn Stevens, “Phosphate as a cardiovascular risk factor: effects on vascular and endothelial function”

Katy Stewart, “Cardiac death in the young in Scotland: Implications for screening”

Eirini Vagena, “Your brain on fat: the role of diet in depression like behaviours”

Miranda Willis, “Prostate cancer: The significance of the cAMP signalling pathway”

Audrey Wright, “The influence of gender and sex hormones in translational and experimental pulmonary arterial hypertension”

Krishna Yalla, “Characterisation of DISC1 ubiquitination and its potential as a therapeutic intervention for Schizophrenia disorders”

Doctorate of Medicine (MD)

Scott Blackwell, “The measurement, biological variation and response to acute inflammation of asymmetric dimethylarginine (ADMA)”

Nazim Ghouri, “The cardiometabolic phenotype of UK south Asian men”

Richard Good, “Antiplatelet response in aspirin and clopidogrel in patients with coronary artery disease undergoing percutaneous coronary intervention”

Peter Higgins, “Novel secondary preventative strategies in the management of ischaemic stroke and transient ischaemic attack”

Yi Ling, “Demographics, epidemiology and prognostic factors in pulmonary arterial hypertension”

Kate McArthur, “Improving efficiency in stroke trials: An exploration of methods to improve the use of the modified Rankin scale in acute stroke trials”

Christopher Payne, “The prediction of average outcomes following major non-cardiac surgery”
2.4 Postgraduate teaching

In the 2014-2015 term, the Institute ran a new programme MSc (Med Sci) Diabetes programme. In response to the global epidemic in obesity and diabetes the University of Glasgow developed this Masters in Diabetes, which commenced in 2014-2015. To address the immense challenge presented by this disease, it is essential that the researchers and medical practitioners of tomorrow understand the cutting edge advances and technologies to tackle diabetes.

We had 101 registered PGT students in the 2013-2014 academic year and 127 registered PGT students in the 2014-2015 academic year. This represented an increase of 26 (25.7%) students on the previous academic year. Thirty-five of the 2014/15 students were international, with the MSc (Med Sci) Clinical Pharmacology attracting the highest number of international students:

<table>
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<th>Programme</th>
<th>Home</th>
<th>International</th>
<th>Total</th>
<th>Change Since 2013-2014</th>
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<tbody>
<tr>
<td>MSc Stratified Medicine &amp; Pharmacological Innovation</td>
<td>27</td>
<td>0</td>
<td>27</td>
<td>+12</td>
</tr>
<tr>
<td>MSc Sport &amp; Exercise Science and Medicine</td>
<td>29</td>
<td>6</td>
<td>35</td>
<td>+9</td>
</tr>
<tr>
<td>MSc (Med Sci) Cardiovascular Sciences</td>
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<td>11</td>
<td>+6</td>
</tr>
<tr>
<td>MSc (Med Sci) Diabetes</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>+5</td>
</tr>
<tr>
<td>MRes Translational Medicine</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>MRes Integrative Mammalian Biology</td>
<td>12</td>
<td>0</td>
<td>12</td>
<td>-1</td>
</tr>
<tr>
<td>MSc (Med Sci) Clinical Pharmacology</td>
<td>12</td>
<td>20</td>
<td>32</td>
<td>-4</td>
</tr>
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2.5 Early career researchers

At the Institute of Cardiovascular and Medical Sciences (ICAMS) our vision is to create a successful and vibrant research institute built on well-funded and internationally recognized research with outstanding training and learning opportunities. The Institute provides numerous opportunities for trainees and researchers to present and interact with each other through educational and career-focused events. ICAMS organizes Research in Progress sessions, which gives students and young researchers the opportunity to share their progress and ideas with their Institute peers. In addition, junior staff and students within ICAMS have created an exciting programme for young scientists called the Young Investigators Network (YIN). The YIN’s vision is to foster the development of ICAMS trainees by providing and environment for them to focus on their training and careers goals in science. YIN meetings include lectures, group discussions and presentations by researchers and panel meetings with senior staff and invited guests with an emphasis on careers, enhancement of CVs, grant writing and many other aspects of science.

Recently, two other outstanding programmes were created at ICAMS. One is the “Fellows Network”, that has been established to create a cross-disciplinary network of early career fellows/new lecturers to meet on a monthly basis to discuss ways in which to collaborate. This new exciting initiative includes around 50 researchers from within the colleges of MVLS and Science and Engineering. As part of the BHF Excellence Centre Award, our ICAMS management group has created a Clinical Experience Programme for Non-clinical Cardiovascular Scientists, where the aim is to contextualise basic science by providing a 5-week programme of activity to encompass the widest possible range of clinical experience in cardiovascular medicine. ICAMS also provides funding for early career Researchers to participate in workshops and courses run by the Staff Development Service, such as the Principal Investigator training programme and grant writing courses.

In addition to all of these opportunities, ICAMS also participates in a number of public engagement activities, led by young investigators, such as the annual University of Glasgow Science Festival, BHF open days and many more.

2.6 Educational events

The Institute of Cardiovascular and Medical Sciences hosts regular educational meetings. Over 2014, there were numerous presentations by invited speakers as well as seminars and symposia. Guest Lectures in 2014 included:

- Mitochondrial dysfunction and bioenergetics in cardiovascular disease (Dr John Mercer, ICAMS, University of Glasgow)
- Mechanisms underlying the developmental origins of the metabolic syndrome (Dr Susan Ozanne, Institute of Metabolic Science, University of Cambridge)
- Multi-microRNA profiles: the next generation biomarkers for heart failure (Dr Joost Leenders, ACS Biomarker, Maastricht)
- Can gastric bypass reverse diabetic kidney disease? (Dr Carle le Roux, Imperial College London)
- Cardiovascular Nitric Oxide: Not all NO? (Prof Keith Channon, University of Oxford)
- How is the redox state of the endoplasmic reticulum optimised for correct disulfide formation (Prof Neil Bulleid, Institute of Molecular, Cell and Systems Biology, University of Glasgow)
- PKCepsilon co-operates with calcineurin to switch fibrosis to wound healing in cardiac fibroblasts downstream of TLR4 (Dr Richard Heads, King’s College London)
- Inflammation, immunity and hypertension (Prof David Harrison, Vanderbilt University, Nashville)
- The unexpected consequences of too much renin inhibition: the kidney takes center stage (Prof Jans Danser, Erasmus Universiteit Rotterdam)
- Cytokines and immune cells in atherosclerosis (Prof Alma Zenercke, DFG-Forschungszentrum für Experimentelle Biomedizin der Universität Würzburg, Germany)
- Endothelial-to-mesenchymal transition: from cardiovascular development to disease (Dr Jason Kovacic, Mount Sinai School of Medicine, New York)
- Control of cAMP signalling and excitation-contraction coupling by phosphodiesterases in normal and diseased heart (Prof Rodolphe Fischmeister, INSERM Unit 769 Paris)
- Cancer’s metabolic vulnerabilities (Dr Eyal Gotlieb, The Beatson Institute for Cancer Research)
- En route to mending broken hearts (Prof Paul Riley, University of Oxford)
- Novel therapeutic approaches for ischaemia-reperfusion injury and shock (Prof Chris Thiermermann, William Harvey Research Institute London)
- Poldip2 and NADPH oxidases in vascular function (Prof Kathy Griendling, Emory University, Atlanta)
Feedback

The following feedback was received from students

“It gave me the opportunity to think critically and discuss scientific material” MSc Clinical Pharmacology

“The business aspect, teaching us about bio business and entrepreneurship is great, all subjects are well taught and intellectually stimulating. I like the fact that the degree is taught across Scotland. The teaching is very good.” MSc Stratified Medicine

“[My advisor] was very approachable and always responded very promptly.”
MSc Sport & Exercise Science and Medicine

“The staff are really approachable to answer any questions. There were also many opportunities to look into evidence based medicine and critical appraisal which was helpful for my future career.”
MSc Clinical Pharmacology

“The range of topics is very interesting”
MSc Stratified Medicine

“I found the Library courses at the start of the academic year very helpful. They provided good preparation for the required workload.”
MSc Sport & Exercise Science and Medicine

- Arterial tortuosity syndrome: unravelling the pathogenetic mechanisms in man, mice and zebrafish (Prof Paul Coucke, Centrum voor Medische Genetica)
- Debunking junk in the human genome (Prof Joseph Miano, University of Rochester School of Medicine and Dentistry)
- Mitochondria as a therapeutic target in heart disease (Dr Thomas Kreig, University of Cambridge)
- Tumor necrosis factor-alpha (TNF) production and function in the kidney (Dr Nick Ferreri, New York Medical College)
- How do endothelial caveolae contribute to cardiovascular health? (Dr Ben Nichols, MRC Laboratory of Molecular Biology, Cambridge)
- Collagen VI myopathies: pathogenic mechanisms and therapeutic perspectives (Prof Paolo Bonaldo, University of Padova)
- How mitochondria produce ROS during ischaemia-reperfusion injury (Dr Mike Murphy, MRC Mitochondrial Biology Unit, Wellcome Trust, Cambridge)
- Cerebral small vessel disease and COL4A1/A2 (Prof Elisabeth Tounier-Lasserve, Molecular Genetics Laboratory in Lariboisière Hospital)
- Pannexins in smooth muscle cells are a pharmacological target for blood pressure regulation (Dr Brant Isakson, University of Virginia School of Medicine)
- Insights into heart failure with preserved ejection fraction: a disease that may or may not exist in search of therapy (Dr Scott Solomon, Brigham and Women’s Hospital – Harvard)
3. Using Knowledge

3.1 Knowledge Exchange

“With research funders and Government focus moving towards recognition and reward of academic endeavour beyond traditional research outputs and the creation of economic, societal or policy related impacts, there is an increasing requirement for academics to pursue Knowledge Exchange (KE) activities alongside or immediately following research projects.

Given the importance of Impact in REF, it is no longer appropriate to decouple ourselves from the process of generating impact, beyond the initial research outcomes and early stage KE activities. Instead, it is in our interests to ensure that impacts are derived from research outcomes wherever possible.

Recognising that timing of KE is critical, in order to nurture successful impact, the University has established a new KE/Impact investment fund to ensure that appropriate pathways to impact are developed and that organisations/individuals capable of influencing and creating impact from new knowledge are properly supported to do so.”

3.2 Public Engagement Activities

Open Day

The Institute of Cardiovascular & Medical Sciences held an Open Day on Tuesday 25th February. Fifty 6th form pupils from a number of schools within the Glasgow area attended in the morning and were given a talk by students from the BHF 4 Year PhD Programme and representatives from Kidney Research UK and the British Heart Foundation. The afternoon and evening sessions attracted volunteers from the BHF’s many charity shops and the general public who had signed up to see some of the exciting research that is being conducted on their doorstep.

A tour of various areas of the BHF Glasgow Cardiovascular Research Centre allowed guests to see the MRI in action and also Ultrasound, pulse wave velocity and analysis, and even a chance to extract DNA from strawberries. There was also an opportunity to have a coffee with the Professors from the Institute. This gave members of the public and pupils a chance to ask questions about research and what a career in science was really like.
Quotes from members of the public who attended:

• “Excellent! Makes my fundraising even more meaningful. Thank you.”
• “Enjoyed the MRI demonstration, it was very interesting, very helpful and explained everything very well.”
• “It was great seeing where the money you donate to the BHF goes.”
• “Very interesting afternoon. Made us feel very welcome and helped us understand what our work funds.”
• “Thank you so much for opening your doors yesterday and for all the organisation behind the scenes to make it happen. We have already received really positive feedback from our supporters about the event, and it will help to inspire them to continue raising funds. It was a huge success, well done!” Carol Nicol, Fundraising Volunteer Manager, British Heart Foundation Scotland

There was also a prize for the best research question won by Duncarrig High School from East Kilbride who asked the question: “Due to increased thickening of blood vessels from cholesterol or plaque, is the uptake of drugs affected?”

World Hypertension Day 2014

This year’s World Hypertension Day was once again a roaring success with 360 blood pressure measurements taken and awareness raised about hypertension! It was decided that this year’s event would be held at Glasgow’s Cosco Supermarket with volunteers Dr Linsay McCallum (Clinical Lecturer), Dr Gemma Currie (Clinical Research Fellow), Ms Janice Meiklejon (Project Manager and Research Nurse), Dr Elizabeth Bell (GP Trainee), Dr Katie Adair (GP Trainee) and Dr Rebecca Brown (GP Trainee) all helping to raise awareness of hypertension and offering free blood pressure checks.

Around 30% of adults have high blood pressure, but half are unaware of their condition. Of those aware half do not take any action to control their blood pressure either using lifestyle modification or medication. This means 75% of the world’s hypertensive population is at risk and are potential candidates for heart disease, stroke or kidney disease or even sudden death. The theme for World Hypertension Day 2014 is “Know Your BP” to increase public awareness and screen for hypertension.
3.3 Impact case studies

Redefining hypertension treatment practice to reduce primary and secondary stroke risk

ICAMS researchers have played lead roles in the design, conduct and analysis of pivotal clinical trials on treatment regimens for hypertension. These research findings have informed European and UK hypertension and stroke guidelines, advancing treatment strategies, and contributed to the observed —25% reduction in the incidence of primary (first) and secondary (recurrent) stroke. Professors Kennedy Lees, John Reid (Regius Professor of Medicine and Therapeutics, 1978–2010) and Matthew Walters and Gordon McInnes (Professor of Clinical Pharmacology, 1980–2007) led ground-breaking clinical studies of the angiotensin-converting enzyme (ACE) inhibitor, perindopril, the first long-acting, once-daily preparation available for use in hypertensive patients.

Specialist stroke services become the national standard of care

ICAMS research involving Prof Peter Langhorne has demonstrated that admission to a specialist stroke unit significantly improves patients’ chances of survival and recovery. This discovery transformed the culture of stroke service delivery in the UK. These studies drove the development of new advice in national and international clinical practice guidelines and promoted the implementation of NHS healthcare targets and audit activities to standardise and evaluate the quality of stroke care. In the UK, the early death rate after stroke has fallen from over 45% to under 30% in the past 20 years; at least one-fifth of that decline is attributed to the introduction of stroke units. Academics involved: Peter Langhorne (Professor of Stroke Care, 1994–present); Brian Williams (Honorary Lecturer in Geriatric Medicine, 1976–2010); William Gilchrist (Honorary Lecturer in Geriatric Medicine, 1988–present).

Landmark advances in outcomes for patients with heart failure

ICAMS researchers, in particular Prof John McMurray have been instrumental in proving the value, in landmark clinical trials, of bisoprolol, candesartan and eplerenone — three of the four classes of drug that reduce mortality, reduce hospitalisaion rates and improve quality of life for patients with heart failure. These trials led directly to revision of clinical guidelines on heart failure management globally (including in Europe, USA, UK, Australia and Canada, all published since 2008). The Glasgow researchers have established heart failure as a healthcare priority and encouraged the introduction of specialist heart failure nurses, saving the NHS an estimated £8 million per year. Collectively, these advances have transformed the treatment and survival rates of heart failure patients worldwide. Academics involved: John Cleland (Senior Lecturer, 1994–1999; then University of Hull and Imperial College, London); John McMurray (Professor of Cardiology, 1999–present); Henry Dargie (Professor of Cardiology 1994-1999; Honorary Senior Research Fellow 1999–present); Ian Ford (Professor of Statistics/Biostatistics 1992–present); Peter Macfarlane (Professor in Medical Cardiology 1991–1995; Professor of Electrocardiology, 1996–2010; Honorary Senior Research Fellow [2008–present]); Ian Ford (Professor of Statistics/Biostatistics, 1992–present); Theresa McDonagh (Senior Lecturer, 1999–2004; then Imperial and King’s College, London).

Global adoption of statins for cardiovascular disease prevention

Over the past 20 years, University of Glasgow researchers have led numerous landmark clinical trials establishing the benefits of statins for CVD prevention. High-profile international clinical guidelines on lipid lowering cite these studies in the key evidence base for recommendations to guide statin use, demonstrating the considerable influence this work exerts on current clinical practice and public health. This has driven the global uptake of statins and provided the evidence-base for CVD risk assessment and prevention strategies that are now implemented worldwide. The use of statins has transformed patient care, provided a cost-effective prevention strategy for healthcare providers and made major contributions to the falling CVD mortality rates across Europe and the US. Staff involved: James Shepherd (Honorary Professor of Clinical Biochemistry [1977–present]); Stuart Cobbe (Walton Chair of Medical Cardiology [1985–2008], Honorary Senior Research Fellow [2008–present]); Ian Ford (Professor of Statistics/Biostatistics [1992–present]); Peter Macfarlane (Professor in Medical Cardiology [1991–1995]; Professor of Electrocardiology, 1996–2010; Honorary Senior Research Fellow [2010–present]); James McKillop (Muirhead Chair of Medicine [1974–2011]); Christopher Packard (Honorary Professor of Clinical Biochemistry [1993–2011]).
Advancing heart disease diagnosis – influencing international guidelines and commercial adoption of automated ECG analysis software

Prof Peter Macfarlane led a team of scientists whose work has changed international guidelines for ECG-based diagnosis of a heart attack (myocardial infarction; MI) and has led to significant refinements to the automated ECG analysis software called the ‘Glasgow Program’. Commercialisation of the Program since 2008 has resulted in its incorporation into some of the market-leading medical devices, with approval of the Glasgow Program by the FDA and more than 40,000 devices sold worldwide, potentially aiding millions of patients around the world. The Program assists hospital doctors, family practitioners and others such as first responding emergency services, e.g. ambulance and fire services, with the reliable interpretation of ECGs, enabling rapid and accurate diagnosis and treatment of patients with a variety of heart problems. Peter Macfarlane (Professor in Medical Cardiology [1991-1995]; Professor of Electrocardiology, [1996-2010]; Honorary Research Fellow [2010-present]); Brian Devine (Software Development Manager [1988-present]); Elaine Clark (Software Applications Specialist [1998-present]).

Statin Therapy: Patient Selection, Clinical Guidelines and revision of safety labelling

Research involving Prof Naveed Sattar has been pivotal in addressing concerns about inappropriate prescribing of cholesterol-lowering statins and has triggered revision of major international guidelines to stratify patients in the general population for statin therapy and guide statin use in the rheumatoid arthritis patient population. The identification of a statin-associated risk for diabetes prompted the European Medicines Agency and the US Food & Drug Administration to revise safety labelling for all classes of statins. This risk is now communicated to the 27 million patients in the UK and US who are prescribed statins. Naveed Sattar (Professor of Metabolic Medicine, 1999-present); Chris Packard (Honorary Professor [clinical biochemistry], 1993-present); Iain McInnes (Professor of Experimental Medicine, 1993-2010; Muirhead Chair of Medicine, 2010–present); David Preiss (Clinical Research Fellow, 2008-2012; Clinical Senior Lecturer 2012-present); Ian Ford (Professor of Biostatistics, 1998-present).
Expanding treatment options and management of acute ischaemic stroke

The economic burden of stroke in the UK is estimated at £3.75bn with hospital inpatient care accounting for 82% of this cost. Since the 1990s advances in thrombolytic treatments (which dissolve blood clots) have limited the extent of damage and subsequent impairment; however, their use has been restricted due to ambiguity between stroke onset and stroke symptom presentation. Work by Profs Lees, Walters and Muir has challenged the restrictions associated with thrombolysis treatment which has significantly influenced the wider use and applicability of thrombolytic treatment. This research has influenced new guideline recommendations and emergency stroke care patterns, through the implementation of dedicated acute stroke centres, and contributed to the on-going improvement in stroke survival rates. Staff involved: Kennedy R Lees (Professor of Cerebrovascular Medicine, 1985–present); Matthew R Walters (Senior Lecturer in Medicine, 2003–2008; Reader, 2008–2010; Professor of Clinical Pharmacology, 2010–present); Keith W Muir (SINAPSE Chair of Clinical Imaging, 2008–present).

Improved clinical guidelines to manage postoperative infection risk in kidney transplant recipients

The greatest infection risk to kidney transplant recipients is from cytomegalovirus (CMV), the standard 2–4 week treatment for which involves an average of 5 days as an inpatient, which can cost up to £13,000. Work by Prof Alan Jardine has led to revised standards of care for the prevention and treatment of CMV disease in kidney transplant recipients (KTRs). First, that antiviral treatment with oral valganciclovir for 200 days can be used to prevent CMV disease in postoperative KTRs and is twice as effective as treatment for 100 days. Secondly, the team found that the use of oral valganciclovir was a practical and cost-effective alternative to intravenous ganciclovir for treatment of mild CMV disease in solid-organ transplant recipients. Since 2009, the use of these therapies has been recommended in key national and international guidelines for the care of KTRs. The research also provided the evidence base that was used for evaluating, and subsequently amending, the marketing authorisation of oral valganciclovir for use in preventative treatment of CMV disease in KTRs in the UK and USA.

Changing clinical guidelines and government policy on VTE prevention among women

Approximately 25,000 people in the UK die each year from venous thromboembolism (VTE); furthermore, VTE affects 1 in 100,000 women of childbearing age and causes one-third of all maternal deaths. Thrombophilia, pregnancy and the use of oral oestrogens can all place women at increased risk of VTE when compared with other individuals. University of Glasgow researchers including ICAMS members of staff quantified the probability of VTE among at-risk women and analysed the benefits and cost-effectiveness of thrombophilia screening. Their research is cited in the recommendations and evidence bases of leading national and international clinical guidelines. This work also galvanised an overhaul of VTE prevention policy within NHS Scotland by emphasising the need for regional health boards to implement and audit standardised in-house protocols and provide accessible patient information on VTE. Staff involved: Olivia Wu (Research Associate, 2001–2008; Reader in Health Economics and Health Technology Assessment, 2008–present); Ian Greer (Professor of Obstetrics and Gynaecology, 1991–2007); Gordon Lowe (Professor of Vascular Medicine, 1978–2009; Honorary Senior Research Fellow, 2009–present); Isobel Walker (Honorary Professor, 2005–present); Peter Langhorne (Professor of Stroke Care, 1994–present); Lindsay Robertson (Research Assistant, 2006–2007).
Transforming the treatment of atrial fibrillation

ICAMS researchers have played leading roles in studies that have identified strategies which prevent AF, improved the safety of AF therapies, and proved the clinical efficacy of a novel anticoagulant to reduce the risk of stroke (the major consequence of AF). The findings have rapidly informed recommendations in international guidelines, prompted regulatory amendments of AF therapies and changed prescribing practices. These advances will affect the estimated 12 million Europeans and Americans suffering from AF. The following high level recommendations based on key trials led or co-led by University of Glasgow investigators are as follows:

- The use of beta-blockers, ARBs and MRAs for prevention of new onset AF (based on findings from CAPRICORN, CHARM and EMPHASIS-HF).
- The use of beta-blockers as first-line therapy to control ventricular rate in patients with AF, heart failure and low LV ejection fraction (LVEF). The addition of a digoxin where monotherapy is inadequate to control the rapid heart rate in patients with AF and heart failure.
- The contraindication of dronedarone for the treatment of AF in patients with advanced heart failure (NYHA class III-IV) or with recently unstable (decompensated within the last month) HF based on findings from ANDROMED.
- The use of apixaban (as one of three NOACs) in all AF patients at high risk of stroke; and furthermore, due to the superior safety profile of apixaban (versus warfarin), the use of apixaban (as one of three NOACs) is recommended in AF patients at lower, intermediate risk of stroke.

Staff involved: John Cleland (Senior Lecturer, 1994–1999; then University of Hull and Imperial College, London); John McMurray (Professor of Cardiology, 1999–present); Henry Dargie (Professor of Cardiology 1994-1999; Honorary Senior Research Fellow 1999–present); Ian Ford (Professor of Statistics/Biostatistics, 1992–present); Mark Petrie (Honorary Reader, 2009-present).
4. Appendices

4.1 Members of the External Scientific Advisory Board

Professor Victor J. Dzau is one of the most influential physician scientists, and leaders in medicine worldwide. He is the Chancellor for Health Affairs and James B. Duke Professor of Medicine at Duke University and the President and CEO of Duke University Health System. Dr Dzau was previously the Hersey Professor of Theory and Practice of Medicine and Chairman of Medicine at Harvard Medical School’s Brigham and Women’s Hospital and the Chairman of Department of Medicine at Stanford University. Dr Dzau has made a significant impact through his pioneering research in cardiovascular medicine, his founding of the discipline of Vascular Medicine, and recently his leadership in Healthcare innovation. His work on the renin angiotensin system (RAS) paved the way for the contemporary understanding of RAS in cardiovascular disease and the development of RAS inhibitors as therapeutics. Dr Dzau pioneered gene therapy for vascular disease and was the first to introduce DNA decoy molecules to block transcriptions as gene therapy in vivo. He pioneered the concept of preemptive gene therapy for myocardial protection. Importantly, his seminal work on stem cell “paracrine mechanism” and the use of microRNA in direct reprogramming provide novel insight into stem cell biology and regenerative medicine.

Among his honours and recognitions are the prestigious Gustav Nylin Medal from the Swedish Royal College of Medicine; the Max Delbruck Medal from Humboldt University, Charite and Max Planck Institute; the Commemorative Gold Medal from Ludwig Maximillian University of Munich and Frey-Werle Foundation; the Inaugural Hatter Award from the Medical Research Council of South Africa; the Polzer Prize from the European Academy of Sciences and Arts; the Ellis Island Medal of Honor of USA; the Novartis Award for Hypertension Research; the Distinguished Scientist Award from the American Heart Association (AHA) and a 2010 AHA Research Achievement Award for his contributions to cardiovascular biology and medicine. He is elected to the American Academy of Arts & Sciences, European Academy of Sciences & Arts, and the Institute of Medicine of the National Academies. He has received 6 honorary doctorates.

He serves on the Council of the Institute of Medicine, the board of directors of Research America and the board of health governors of the World Economic Forum. He is also Chair elect of the Association of Academic Health Centers. He has chaired the NIH Cardiovascular Disease Advisory Committee as well as the Council of Atherosclerosis, Thrombosis and Vascular Biology of the American Heart Association, and has served on the Advisory Council to the Director of NIH.

Professor Stephen O’Rahilly MD FRS graduated in Medicine from University College Dublin in 1981 followed by an internship at the Mater Hospital. From 1982-1991 he undertook postgraduate training in general medicine and endocrinology and in diabetes research in London, Oxford and Harvard. In 1991 he established his own laboratory in University of Cambridge at Addenbrooke’s Hospital where he was a Wellcome Trust Senior Fellow in Clinical Science. In 1996 he was appointed to a newly created Chair of Metabolic Medicine and in 2002 was appointed to the Chair of Clinical Biochemistry and Medicine at the University of Cambridge. He is also the Director of the Institute of Metabolic Science Metabolic Research Laboratories. His research has been concerned with the elucidation of the basic causes of Type 2 diabetes and obesity at a molecular level. His work has uncovered several previously unrecognised genetic causes of these diseases including some that are amenable to specific treatment. He has won many awards for his work including the Society for Endocrinology Medal, the European Journal of Endocrinology Prize, the Novartis International Award for Clinical Research in Diabetes, the Heinrich Wieland Prize, the Rolf Luft Award, the Feldberg Prize, the Society for Endocrinology Dale Medal and the InBev Baillet-Latour Prize for Health. He was elected to the Academy of Medical Sciences in 2000, to the Royal Society in 2003 and to the US National Academy of Sciences as a Foreign Associate in 2011. While maintaining a large research laboratory he continues to be actively involved in clinical practice and the teaching of clinical medical students.
Professor David Eisner (B.A. Cambridge, Natural Sciences, 1976; D.Phil Oxford, Physiology, 1979). He spent the period 1980-1990 in the Department of Physiology at University College London. From 1990-1999 he was Professor of Veterinary Biology at Liverpool University before moving to University of Manchester as Professor of Cardiac Physiology in October 1999. He was appointed to the BHF Chair in Cardiac Physiology in 2000.

He has received the Pfizer Prize for Biology (1985), the Wellcome Prize in Physiology (1988) and given the QR Murphy lecture at the University of Wisconsin (1992), the Reimer Lecture of the International Society for Heart Research (2008), the Dorothy Wedgwood Lecture for Young People (2008) and the Peter Baker Memorial Lecture (2010). He has been elected a Fellow of the Academy of Medical Sciences and to Honorary Fellowship of the Royal College of Physicians. He serves on the editorial boards of Basic Research in Cardiology, Cell Calcium and Experimental Physiology. He is a Senior Consulting Editor of Circulation Research. He is the Editor in Chief of The Journal of Molecular and Cellular Cardiology. Until July 2000, he was Chairman of the Editorial Board of The Journal of Physiology. He was previously International Secretary of the Physiological Society and Chair of the British Society for Cardiovascular Research. He is the President of the Federation of European Physiological Societies (FEPS) and president-elect of the International Society for Heart research (European Section). He chairs the International Scientific Programme Committee for the 2013 meeting of the International Union of Physiological Sciences (IUPS). He has served on panels for the Research Assessment Exercise (RAE) in 2001 and 2008 and is on a panel for REF2014.

His research is focused on calcium regulation in the myocardium. Much of his work has concentrated on the basic mechanisms that regulate the amplitude of the systolic calcium transient and, in particular, the properties of the sarcoplasmic reticulum. His recent work had also shed light on the relationship between abnormalities of Ca regulation and the genesis of arrhythmias.

Professor Marc Pfeffer is currently the Dzau Professor of Medicine at Harvard Medical School. He is Senior Physician in the Cardiovascular Division at the Brigham and Women’s Hospital in Boston, and Director of the Cardiovascular Grand Rounds Program. He also serves as Medical Director of Partners Research and Education Program.

A noted researcher, Dr Pfeffer, along with his late wife, Dr Janice Pfeffer, and Eugene Braunwald MD, is credited with introducing the concept that angiotensin-converting enzyme inhibitors (ACEIs) could attenuate ventricular remodelling following myocardial infarction and that this use would result in a prolongation of survival and other clinical benefits. Since this initial discovery, he has had a principal role in several practice-changing clinical trials such as SAVE, CARE, HEART, VALIANT, CHARM, and PEACE. He is currently a leading investigator in TOPCAT, TREAT, ALTITUDE and ELIXA. In addition to his role as researcher, Dr Pfeffer plays an active role in the academic development of trainees and junior faculty collaborating in trials. As the leader of Partners Research and Education Program (PREP), he has developed networks of community-based physicians who enjoy making meaningful contributions to clinical investigation.

Dr Pfeffer is Senior Associate Editor of Circulation and is a member of the Editorial Board of several other prominent journals.

An internationally recognized expert in the field of cardiology, he was, in 2006, recognized by Science Watch as having the most ‘Hot Papers’ (highly cited) in all of clinical medicine. He is the recipient of the William Harvey Award of the American Society of Hypertension, the Okamoto Award from Japan’s Vascular Disease Research Foundation and the Clinical Research Prize of the American Heart Association. Dr. Pfeffer is an Honorary Fellow of the Royal College of Physicians and Surgeons of Glasgow.
Multi award winning Professor Peter Macfarlane has been honoured once again, this time as a Commander of the Order of the British Empire! The award is in recognition of nearly 50 years of effort pioneering the method of automated interpretation of electrocardiograms. As a result, the University now has links with over 20 commercial companies and universities worldwide who use the software, or the ‘Glasgow Program’, designed by Prof Macfarlane and his team. Prior to the early 1980’s, when the ‘Glasgow Program’ was first licensed to Siemens, the University had no commercial business unit in place, which is in marked contrast to the current situation where the University is keen to encourage commercial development of successful research work where appropriate.

Prof Macfarlane, a Fellow of the Royal Society of Edinburgh and a previous recipient of the Rijlant International Prize, expressed his gratification by saying “I am pleased and honoured to be awarded the CBE, which was a complete surprise! I would like to think that it is in recognition of the team effort.” Prof Macfarlane was keen to acknowledge in his CBE award honour the important role of his team (The Electrocardiology Group), and the excellent work they do from their base at Glasgow Royal Infirmary.

4.3 Research awards in 2014*

Role of non-coding RNA in vascular pathology, British Heart Foundation, £1,428,700.00, PI – Prof Andrew H Baker, CoPIs-Drs Angela Bradshaw & Robert McDonald

Xanthine oxidase inhibition for improvement of Long-term Outcomes following ischaemic stroke and transient ischaemic attack (XIL-FAST), Stroke Association, £999,936.02, PI – Dr Jesse Dawson, CoPIs – Profs Kennedy Lees & Matthew Walters, and Dr Terence Quinn

Scalable in Vitro Production of Red Cells for Clinical Transfusion, Wellcome Trust, £785,574.92, PI – Dr Joanne Mountford

In Situ Nanoparticle Assemblies for Healthcare Diagnostics and Therapy, Engineering & Physical Sciences Research Council, £591,518.01, CoPI – Prof Naveed Sattar

Designer Receptor Exclusively Activated by Designer Drug’ to define the role of short chain fatty acids in metabolic disease and inflammation (Fatty acid DREADD), Biotechnology and Biological Sciences Research Council, £504,950.64, CoPI – Dr Ashley Miller

Adenovirus and coagulation factor interactions and the impact on virus stability and utility for gene therapy, Biotechnology and Biological Sciences Research Council, £468,403.80, PI – Prof Andrew H Baker, CoPI – Dr Stuart Nicklin

RATULS: Robot assisted training for the upper limb after stroke, Health Technology Assessment, £465,369.20, PI – Dr Jesse Dawson

The UPBEAT RCT mother-child study. Stratifying and treating obese pregnant women to prevent adverse pregnancy, perinatal and longer term outcomes, Medical Research Council, £440,234.37, CoPI – Prof Naveed Sattar

A very early rehabilitation trial after stroke (AVERT): A phase 3, multicentre, randomised controlled trial, National Institute for Health Research, £406,879.87, PI – Prof Peter Langhorne

Gender and the development of pulmonary arterial hypertension: regulation of genes from mouse to man, British Heart Foundation, £365,830.15, PI – Prof Mandy MacLean, CoPI – Prof Andrew H Baker

Angiotensin-(1-7) and angiotensin-(1-9): assessment as therapeutic targets in acute vascular injury and remodelling, Medical Research Council, £357,421.99, PI – Dr Stuart Nicklin, CoPIs – Prof Andrew H Baker & Dr Simon Kennedy

* New research grants awarded in 2014 on which Institute members were investigators. The funding stated is the amount that has come to the University of Glasgow which, for some grants, may be less than the total amount awarded.
REMOVAL study: REducing with Metformin microvascular Outcomes and VAascular complications in T1DM, Juvenile Diabetes Foundation, £354,216.56, PI – Prof John Petrie, CoPI – Prof Naveed Sattar

The menopausal transition and healthy ageing and wellbeing, Medical Research Council, £233,913.00, CoPI – Prof Naveed Sattar

Non invasive brain stimulation in stroke patients, Scottish Executive Health Department, £220,350.98, CoPI – Prof Matthew Walters

Sedentary behaviour in older adults: investigating a new therapeutic paradigm, Medical Research Council, £218,200.02, PI – Dr Jason Gill, CoPI – Prof Naveed Sattar

Suppression of IL-6 trans-signalling by BMP4: a missing link “In the development of pulmonary arterial hypertension?”, British Heart Foundation, £207,207.00, PI – Dr Tim Palmer, CoPI – Prof Mandy MacLean

Can a football-based weight management, physical activity and healthy living programme be adapted for delivery in secure institutional settings to support at risk groups in positive, sustainable ..., Scottish Executive Health Department, £203,676.40, CoPI – Dr Bill Mullen

Inhibition of endothelial mitogen-activated protein kinases by amp-activated protein kinase, British Heart Foundation, £189,759.00, PI – Dr Ian Salt, CoPI – Dr Tim Palmer

Mechanisms underlying the development of pulmonary arterial hypertension, Medical Research Council, £141,161.06, PI – Prof Andrew Peacock, CoPI – Dr David Welsh

Clot Lysis: Evaluating Accelerated Resolution of IVH Phase III (CLEAR 3), National Institute of Health, £131,814.11, PI – Prof Kennedy Lees, CoPI – Dr Jesse Dawson

Music for the Brain: Music, mindfulness and attentional control in post-stroke recovery, Dunhill Medical Trust, £127,622.00, CoPIs – Prof David Stott & Dr Terence Quinn

Angiotensin-(1-7): a novel treatment for acute and long term recovery from stroke?, The Henry Smith Charity, £124,600.00, CoPIs – Drs Lorraine Work & Stuart Nicklin

First steps towards modelling myocardial infarction (a computed MI Physiome): A case-control study of novel biomechanical parameters in acute MI survivors with left ventricular dysfunction., British Heart Foundation, £106,456.00, PI – Prof Colin Berry

Defining miRNA signatures that regulate pericyte proliferation: a novel approach to develop miRNA-based therapeutic strategies for the treatment of ischaemic complications., British Heart Foundation, £82,549.42, PI – Dr Marco Meloni, CoPIs – Prof Andrew H Baker & Dr Joanne Mountford

Magnetic Resonance Imaging Using Ultrasound Superparamagnetic Particles of Iron Oxide to Predict Clinical Outcome in Patients Under Surveillance for Abdominal Aortic Aneurysms: the MA3RS Trial, Medical Research Council, £81,343.97, PI – Dr Colin Berry

Biomarker Discovery 2.0 – Rigorous and Robust Metabolite Characterization using Mass Spectrometry Fragmentation approaches (ISSF Fellowship), Wellcome Trust, £76,390.27, CoPI – Dr Sandosh Padmanabhan

MISTIE III, National Institute of Health, £72,827.87, PI – Prof Kennedy Lees, CoPI – Dr Jesse Dawson

Red Blood Cell Project, Scottish National Blood Transfusion Service, £70,000.00, PI – Dr Joanne Mountford

Development of an efficient, robust MS-based platform for early detection of acute kidney injury, Medical Research Council, £57,984.42, PI – Prof Harald Mischak, CoPIs – Prof Matthew Walters & Dr Patrick Mark

Targeting microRNA-96 for the treatment of pulmonary arterial hypertension., Medical Research Council, £56,569.00, PI – Prof Mandy MacLean, CoPI – Prof Andrew H Baker


Southall blood sample analysis collaboration – UCL, NHS Greater Glasgow & Clyde, Endowment Funds Office, £50,000.00, PI – Prof Naveed Sattar, CoPI – Dr Paul Welsh

A new urinary biomarker for stroke, Medical Research Council, £50,000.00, PI – Dr Jesse Dawson

Explaining excess winter mortality from CHD: analysis of UK based prospective studies, British Heart Foundation, £45,597.38, CoPIs – Prof Naveed Sattar & Dr Paul Welsh

Contribution to Salary Costs Dr Kenneth Mangion, NHS Greater Glasgow & Clyde, £29,999.99, PI – Prof Colin Berry

Pilot MRI Study for the Investigation of Pathophysiology in Intracerebral Haemorrhage, Academy of Medical Sciences, £29,959.00, CoPI – Prof Harald Mischak
Longitudinal Observations of Weight Reduction (LOWER) – Feasibility Study, Scottish Executive Health Department, £25,519.93, PI – Dr Jennifer Logue

Therapeutic manipulation of miR-214, Medical Research Council, £25,000.00, PI – Dr Laura Denby, CoPIs – Profs Andrew H Baker & Christian Delles, and Dr Patrick Mark

Monitoring contractility of bio-realistic human cardiac tissue in-vitro ref CRACK IT Challenges 35587-259131, National Centre for Replacement,Refinement and Reduction of, £24,200.00, PI – Prof Godfrey Smith

Supporting the ischaemic brain with oxygen-carrying perfluorocarbons., Scottish Executive Health Department, £23,023.81, CoPI – Dr Lorraine Work

The INSPIRE programme, Academy of Medical Sciences, £22,500.00, PI – Prof Matthew Walters, CoPI – Dr Marie Freel

Non contrast magnetic resonance imaging to measure renal transplant perfusion and fibrosis - association with function and prognosis, Darlinda’s Charity for Renal Disease, £20,000.00, PI – Dr Rajan Patel, CoPI- Dr Patrick Mark

Proposal of NDA work for the South Asian Health Foundation, South Asian Heart Foundation, £20,000.00, PI – Prof Naveed Sattar

GU Clinical Pharmacology Development Fund, NHS Greater Glasgow and Clyde, £20,000.00, PI – Prof Matthew Walters

Angiotensin-(1-9) a novel peptide therapeutic for improving cardiac function., Medical Research Council, £20,000.00, PI – Dr Stuart Nicklin, CoPI – Dr Christopher Loughrey

BHF Pump Priming Grant: How does the landscape of long non-coding RNA impact upon endothelial differentiation and specification from hES cells?, British Heart Foundation, £20,000.00, PI – Prof Andrew H Baker, CoPI – Dr Joanne Mountford

SurgiCal Obesity Treatment Study (SCOTS), National Institute for Health Research, £18,500.00, PI – Dr Jennifer Logue, CoPIs – Prof Naveed Sattar & Dr Robert Lindsay

IAA-EPSRC: Upgrade of cellOPTIQ function to allow simultaneous multiple fluorescence measurements, Engineering & Physical Sciences Research Council, £16,900.00, PI – Prof Godfrey Smith, CoPI – Dr Margaret Craig

Understanding experiences and multi-dimensional needs of people with major stroke: A mixed methods study., Scottish Executive Health Department, £15,696.25, PI – Prof David Stott

Metabolite and protein profiling in CADASIL to unravel the vascular pathophysiology and natural history, NHS Endowment Funds, £14,671.00, CoPIs – Prof Christian Delles & Dr Bill Mullen

Development and Validation of a Short Form for the Stroke Impact Scale, Chest, Heart & Stroke, Scotland, £14,252.06, PI – Dr Terence Quinn

Structure and Function of High Density Lipoprotein, Kuwait Foundation for the Advancement of Sciences, £14,102.00, PI – Prof Muriel Caslake

Understanding risk factors for subclinical cerebrovascular disease in patients receiving haemodialysis, NHS Endowment Funds, £14,000.00, PI – Dr Mark Findlay, CoPI- Dr Patrick Mark

A multi-centre randomised controlled trial of Comprehensive Geriatric Assessment (CGA) in an admission avoidance hospital at home setting, National Institute for Health Research, £12,417.00, PI – Prof David Stott, CoPI – Prof Peter Langhorne

Systems biology analysis of multi-omics data and development of integrative analysis methods for biomarkers and determinants of treatment-refractory severe asthma (ISSF Catalyst), Wellcome Trust, £12,198.27, PI – Prof Christian Delles, CoPIs – Drs John McClure & Dr Holger Husi

Investigation of the role of the IL-33 in inflammatory responses during hypertension, Tenovus-Scotland, £12,000.00, PI – Dr Ashley Miller, CoPI – Prof Tomasz Guzik

Support for Cardiovascular Physiology, Clyde Biosciences Limited, £11,833.72, PI – Prof Godfrey Smith

Using C. elegans to identify novel genetic modifiers of collagen IV mutations that cause stroke, Tenovus-Scotland, £11,594.40, PI – Dr Tom Van Agtmael

Understanding the genetic regulation of adrenal steroid hormones in cardiovascular disease â€” Developing a stratified approach to cardiovascular care, Scottish Executive Health Department, £11,172.97, PI – Prof Eleanor Davies, CoPI – Dr Scott Mackenzie

The role of non-HLA antibodies in antibody mediated rejection in renal transplantation, NHS Greater Glasgow and Clyde, £11,090.00, PI – Dr Kathryn Stevens
The role of insulin-dependent signalling pathways in the control of Mesenchymal stem cell differentiation towards bone and fat, Tenovus-Scotland, £10,000.00, CoPI – Dr Ian Salt

Pilot project to establish a Scottish wide bio-resource for type 2 diabetes - scoT2bio, NHS Endowment Funds, £10,000.00, PI- Dr David Preiss, CoPI- Prof Naveed Sattar

Contribution to Salary Costs Dr Kenneth Mangion, NHS Greater Glasgow & Clyde, £10,000.00, PI – Prof Colin Berry

Relationship of thyroid function tests in early gestation with pregnancy outcomes, Society for Endocrinology/Clinical Endocrinology Trust, £9,500.00, PI – Dr David Carty

The effect of metformin therapy on NT-proBNP levels in non-diabetic patients with established coronary heart disease, NHS Greater Glasgow and Clyde, £9,375.00, PI – Dr David Preiss, CoPIs – Prof Naveed Sattar & Dr Paul Welsh

The role of non-HLA antibodies in antibody mediated rejection in renal transplantation, Darlinda’s Charity for Renal Disease, £8,220.00, PI – Dr Kathryn Stevens

Altered corticosteroid metabolism in the pathophysiology of pre-eclampsia and gestational hypertension – a potential tool for future risk stratification?, NHS Endowment Funds, £8,000.00, PI – Dr Gemma Currie

How best to deliver comprehensive geriatric assessment (CGA), National Institute for Health Research, £7,583.02, PI – Prof Peter Langhorne, CoPI- Prof David Stott

Reduction of adipose levels of inflammation when treating obesity – Feasibility Study, NHS Greater Glasgow & Clyde, £7,255.00, PI – Dr Jennifer Logue, CoPI – Dr Ashley Miller

Setting Scottish Stroke Services in an International Context, Chest, Heart & Stroke, Scotland, £6,540.00, PI – Prof Peter Langhorne

The impact of therapy based rehabilitation services late after stroke, Chest, Heart & Stroke, Scotland, £5,000.00, PI – Prof Peter Langhorne

The use of proton nuclear magnetic resonance to investigate dyslipidaemia and small molecule accumulation in chronic kidney disease (ISSF Catalyst), Wellcome Trust, £4,699.99, PI – Dr Naomi Rankin, CoPIs – Prof Naveed Sattar & Drs David Preiss and Patrick Mark

Glibenclamide and metfoRmin versus stAndard Care in gEstational diabeteS (GRACES) – a feasibility open label randomised trial, Scottish Executive Health Department, £2,932.91, PI – Dr Robert Lindsay

Investigation of the long-term effects of intrauterine exposure to maternal diabetes: a record linkage study, Scottish Executive Health Department, £1,880.28, PI – Dr Robert Lindsay

Cochrane Stroke Group: Stroke Evidence Database, Scottish Government Health Directorates, £1,250.00, PI – Prof Peter Langhorne
4.4 ICAMS publications during 2014


ICAMS publications during 2014


ICAMS publications during 2014


ICAMS publications during 2014


100. Farmer DGS, Ewert M-A, Mair KM, Kennedy S. Soluble receptor for advanced glycation end products (sRAGE) attenuates haemodynamic changes to chronic hypoxia in the mouse. *Pulmonary Pharmacology and Therapeutics* 2014;29:7-14.


ICAMS publications during 2014


ICAMS publications during 2014


190. Langhorne P. Early transfer of patients with stroke to comprehensive stroke centers is not necessary. Stroke 2014;45:3750-3751.


ICAMS publications during 2014


ICAMS publications during 2014


ICAMS publications during 2014


ICAMS publications during 2014


322. Robertson J, McInnes I, Sattar N. Response to ‘Interleukin-6 signal transduction and its role in hepatic lipid metabolic disorders’ by Hassan et al. *Cytokine* 2014;70:198.


ICAMS publications during 2014


ICAMS publications during 2014


ICAMS publications during 2014


4.5 Book sections and chapters


4.6 PhD Students

Nur Ab Razak
Marah Hussen Abduljabbar
Emma Aitken
Sukainah Al Alshaikh
Nasser Mohammad Aldekhiail
Noor Alfailakawi
Husam Alganga
Jahad Alghamdi
Nora Hassan Alharbi
Faridah M E Alkandari
Andrew Allan
Tarek Almabrouk
Nasser Abdullah S Alotaiq
Abdulaziz Alqadi
Saffa Mohammed M Alsanosi
Mohammed Alsieni
Sultan Al-Suhaim
Margaret Dickson Ballantyne
Aline Rachel Bezerra Gurgel
Emma Boulton
Christopher Breen
Catriona Brown
Ross Campbell
Annabel Campbell
Jane Cannon
David Carrick
David Corcoran
Robert Cretella
Gemma Elizabeth Currie
Ana Da Silva Costa
Lin Deng
Maria Dulak-Lis
Farha Elwafi A Elsakloul
Lopez Gordo Estrella
Caroline Fattah
Marco Fernandes
Mark Findlay
Laruen Kay Fleming
Khioud Ghafoori
Keith Gillis
Teja Gregorc
Crawford Halliday
Craig Hamilton
Nabeha Saleh A Hawari
Weihong He
Helen Heathcote
Kirsty Hendry
Barry William Hennigan
Naomi Holman
Katie Yates Hood
Eleanor Jarvie
Valentine Jeantet
Omar Jassim Katwan
Christopher Lavery
Rosalind Lees
Craig Livie
Emma Louise Low
Michael Lynch
Wardati Mazlan Kepli
Lisa McArthur
Linsay McCallum
Karen McGlynn
James McLaren
Hannah Martin
Hannah Louise Morgan
Kirsten Munro
Gerard Murphy
Katrin Nather
Karla Bianca Neves
Alexander Payne
Ana Perez
Scott Robinson
Ivona Ruseva
Rachel Savage
Elizabeth Scott
Li Shen
Joanne Simpson
Heather Small
Claire Speirs
Valters Stelmanis
Hannah Stepto
Wan Noraini Wan Sulaiman
Pantazis Takas
Josie Charlotte Van Kralingen
Emma Wallace
Nicola Walsh
Anna Dorothy White
Lauren Willis
Zichu Yang
Apostolos Zarros

4.7 MD Students

Azmil Abdul-Rahim
Athar Ali Badar
Lauren Brash
Melanie Jade Brewis
Stephen Crawley
Richard Dobson
Patricia Fearon
Jamie Layland
Neil McGlinchey
Lindsey McLucie
David Mitchell
Ify Mordi
Elaine Robertson
Stephen David Thomson
Chih Wong
4.8 2015-2020 Strategic Plan
Executive Summary

OVERVIEW

The previous strategic priorities for ICAMS were written in 2010 when the Institute was created with the new academic structuring of the University.

Building on the successes of the university restructuring and creation of ICAMS, the Institute leadership has reflected on the performance over the past four years and sought to determine key priorities for the next 5 years and beyond. Moving forward, we need to continue to advance our successes and reflect on how we can improve the areas where we are weaker. ICAMS is proud of its research excellence and needs to ensure continued growth and successes and optimisation of unique opportunities.

A series of events took place, involving ICAMS staff, between 2012 and April 2014 to inform how the above process can be realised:

• An externally facilitated day where ICAMS senior staff reflected on strengths and weaknesses of the institute (Golden Jubilee, 28 May 2012).

• A two-day evaluation of ICAMS by an international external scientific advisory board (ESAB) (10-12 March 2014).

Based on input by ICAMS staff, and taking into account the constructive comments by the ESAB, the leadership of ICAMS has created a new strategic plan, focusing primarily on advancing scientific strengths and areas of excellence, so that over the next 5 years, researchers at ICAMS will reach their potential of excellence and that research in ICAMS will attain a higher level of academic quality, as reflected by research outputs, impact, funding and training of the next generation of cardiovascular scientists.

Presented here are the 2015-2020 strategic priorities of ICAMS and the changes in structure and operations that will allow for the realisation of these priorities. This document focuses on the research component of ICAMS. While teaching continues to be an important activity of the Institute, this will not be addressed here.
RESEARCH PRIORITIES OF ICAMS

Research
Research is the prime activity of the Institute and forms the central core around which all our other activities take place. In order to achieve our objectives we need to further support our areas of strength, but also concentrate more effort and resources on the areas that have been identified as demonstrating potential to be fields of research excellence. Accordingly, the 5-pillar thematic structure currently in place in ICAMS will be dissolved and replaced by a new scientific structure.

Over the next 5 years, research in ICAMS will focus on three primary themes; Cardiac, Vascular and Metabolic Disease/Diabetes, in an integrated and translational manner (Figure 1).

Specific changes:
• Stroke and kidney research relative to cardiovascular disease, are areas of potential strength in ICAMS. These research areas will be developed over the next 5 years to achieve research excellence in both basic and clinical domains. Senior research leaders will be identified. Development of stroke and kidney research will require interactions with other Institutes, for example basic stroke research in the Institute of Neuroscience and Psychology; and basic renal immunology research in the Institute of Immunity, Inflammation and Infection.
• Methodology-based systems, including, -omics, clinical trials and biostatistics will cross through all research axes and will no longer be stand alone themes in ICAMS.
• Endocrinology (except diabetes) will not be pursued as a scientific priority in ICAMS.

Training next generation cardiovascular scientists
While ICAMS has a strong representation of Masters and PhD students, there are too few post-doctoral fellows relative to students (2014-2015: PhD-94, MSc-129, and Post-Doc-47). Postdoctoral research is the primary source of productivity in most laboratories and is essential for the career advancement of young scientists. Post-doctoral research is also essential in advancing the scholarly mission and scientific priorities of ICAMS.

• Over the next 5 years, ICAMS will aim to increase the number of post-doctoral fellows (basic and clinical) through new schemes, such as small internal grants, new fellowships funded through the BHF Excellence award and post-doctoral focused mentoring schemes. New programme and project grants will focus on funding for new post-doctoral fellows.
• ‘Internationalisation’ of ICAMS post-doctoral fellows will be implemented through travel grants and lab exchange programmes.
ICAMS OPERATIONS

In order to support the renewed focus and ensure the new strategy is delivered, a more streamlined management structure will be established where information from the University and College will be efficiently relayed to ICAMS leadership and all ICAMS staff, and where information from ICAMS staff will flow back to the leadership.

The new management structure will comprise the following committees: Executive Committee, Scientific Steering Committee, Research Knowledge Exchange and Impact Committee and Operations Committee. There will no longer be a “Management Committee”, instead an Open Forum for all staff will be created.

The new ICAMS structure is summarised in Figure 2.
Committee members

ICAMS Executive Committee:
R. Touyz, A. Baker, J. McMurray, G. Smith (to meet monthly)

ICAMS Operations Committee:
Chair. A. Baker (to meet 2 monthly)
• Teaching and Learning (T&L)  S. Nicklin
• Post graduate research (PGR)  E. Davies
• Finances  J. Blair
• Health and Safety  W. Lee
• Web and Communications  S. MacDonald
• Internationalisation  C. Loughrey
• Athena Swan  R. Touyz
• Young Investigator Network (YIN)  S. Johnstone
• Mentoring  A. Baker
• BHF Centre of Excellence  K. Trofimova
• Clinical/NHS  R. Lyndsay

ICAMS Scientific Steering Committee:
Chair: R. Touyz (to meet 4-6 weekly)
• Vascular: R. Touyz, C. Delles, T. Guzik, A. Baker, M. MacLean
• Cardiac: C. Berry, J. McMurray, G. Smith, G. Baillie
• Metabolic Disease/Diabetes: N. Sattar, J. Petrie.
• Stroke: J. Dawson
• Kidney: P. Mark
• –Omics: S. Padmanabhan

Research Knowledge Exchange and Impact Committee:
Chair: G. Smith (to meet bi-monthly).
G. Smith, G. Baillie, N. Sattar, J McMurray, J Mountford.

Impact of changes
Success of the new strategic plan will be assessed in 3 and 5 years, based on:

1. Increased productivity in 3*/4* high impact journals across the Institute
2. Increased funding levels across the Institute aligned with priority scientific priorities.
3. New large-scale programme grants to be developed through the 3 scientific priority themes. At least 1 new programme grant/theme is expected within 3-5 years.
4. Recruitment of at least 2 new senior staff to priority research themes.
5. Growth of post-doctoral cohort across the Institute.
6. Increased internationalisation of post-doctoral fellows.

CONCLUDING COMMENTS

• Through focused strategies, more opportunities will be available to facilitate ICAMS researchers to reach their potential of excellence.
• It is anticipated that the new strategic plan will facilitate superior research in ICAMS taking the Institute to a higher level of scientific excellence and international standing.
• Resources, infrastructure and investments will focus on priority areas.
• Researchers should align to the defined areas of scientific priorities in ICAMS.
• The new plan will commence in January 2015, in line with the University 2015-2020 vision.