2015 has been another important year for the Institute of Cardiovascular and Medical Sciences (ICAMS). Our successes and strengths build on a strong foundation as evidenced earlier this year by the outcomes of the REF2014, which reflected the significant research contributions and impact cases submitted by ICAMS members to Unit of Assessment 1.

In 2015, ICAMS held over 475 active research grants of almost £55 million. Outcomes of these grants is reflected by the high publication record, with over 430 papers published by ICAMS researchers in 2015. Our papers are highly cited and highly respected with almost 60% of ICAMS papers appearing in the top 10% of most highly cited papers worldwide and almost 12% appearing in the top 1% most highly cited papers globally. In addition, ICAMS researchers are cited 4 times more than the global average.

Our excellence in new cardiovascular discoveries and advancement in knowledge feeds into excellence in training, teaching and learning. ICAMS continues to be a highly sought after institution for higher learning for graduate and postgraduate trainees. In 2015 we awarded 13 PhD/MD degrees, we had over 140 registered postgraduate taught students and almost 130 postgraduate research students. These numbers reflect student growth and we will continue to work hard to attract the brightest and the best young students with an interest in cardiovascular science and medicine.

In 2015 the new ICAMS management structure and operational schemes were initiated and the Research themes were consolidated. These new initiatives followed up on the suggestions and feedback by the 2014 External Scientific Advisory Board. I thank the leadership of ICAMS in helping with the smooth transition to the new system.

ICAMS has much about which to be proud. As highlighted in this 2015 report, we excel in research and training, many of our members have received prestigious honours and awards, our global outreach is growing, we have initiated a number of new programmes to support young researchers and ICAMS continues to be an attractive institution to host world renowned guest speakers.

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

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

1. **Strategy and Research Priorities**
   1.1 Overview ........................................... 6
   1.2 Research Priorities ............................... 6
   1.3 Institute Structure ................................ 8
   1.4 Institute Committee .............................. 9
   1.5 Research Themes .................................. 10

2. **BHF Centre of Research Excellence**
   2.1 BHF Centre of Research Excellence in Vascular Science & Medicine ...................... 13

3. **General Information**
   3.1 Funding ............................................. 16
   3.2 Publications ........................................ 17

4. **Sharing Knowledge**
   4.1 Global Partnerships ................................ 18
   4.2 Investing in the Future ............................ 19
   4.3 Postgraduate Research ............................ 19
   4.3.1 Awarded Postgraduate Research Degrees in 2015 ........................................... 19
   4.4 Postgraduate Teaching ............................ 20
   4.5 Early Career Researchers ........................ 22
   4.6 Educational Events ................................. 22

5. **Using Knowledge**
   5.1 Knowledge Exchange .............................. 24
   5.2 Public Engagement Activities ................... 24
   5.3 Impact Case Studies ............................... 28

6. **Appendices**
   6.1 Members of the External Scientific Advisory Board ................................................. 33
   6.2 Honouring Staff ..................................... 36
   6.3 Research Awards .................................. 38
   6.4 Publications ........................................ 42
   6.5 Book Sections and Chapters ..................... 70
   6.6 PhD Students ....................................... 71
   6.7 MD Students ........................................ 71
1. Strategy and Research Priorities

1.1 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). A summary of the comments of the ESAB is attached.

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.

1.2 Research Priorities

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, the primary research themes will be focused on Cardiac, Vascular, and Metabolic Disease/Diabetes in an integrated and translational manner.

Specific changes:

- Stroke and kidney research, currently identified as areas of potential strength in ICAMS, will be developed over the next 5 year period to achieve research excellence in both basic and clinical arenas. 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 standalone themes in ICAMS.
- Endocrinology (except diabetes) will not be pursued as a scientific priority in ICAMS.

BHF CORE

The BHF Centre of Research Excellence (CoRE) in Vascular Science and Medicine was awarded to ICAMS and launched in 2014 and operates alongside our research themes. See section 2 (page 13) for further information.
TRAINING NEXT GENERATION CARDIOVASCULAR SCIENTISTS

While ICAMS has a strong representation of Masters and PhD students, there are too few postdoctoral 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. Postdoctoral 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 postdoctoral fellows (basic and clinical) through new schemes, such as small internal grants, new fellowships funded through the BHF Excellence award and postdoctoral focused mentoring schemes. New programme and project grants will focus on funding for new postdoctoral fellows.
- ‘Internationalisation’ of ICAMS postdoctoral 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.

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 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 postdoctoral cohort across the Institute.
6. Increased internationalisation of postdoctoral 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 plan commenced in January 2015, in line with the University 2015-2020 vision.
1.3 Institute Structure
1.4 Institute Committees

**EXECUTIVE COMMITTEE**

Prof Rhian Touyz  
Prof Andrew H Baker  
Prof Godfrey Smith  
Prof John McMurray  
Ms Jillian Blair

**OPERATIONS COMMITTEE**

<table>
<thead>
<tr>
<th>Chair</th>
<th>Professor Andrew H. Baker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and Learning</td>
<td>Dr Stuart Nicklin</td>
</tr>
<tr>
<td>Postgraduate Research (PGR)</td>
<td>Professor Eleanor Davies</td>
</tr>
<tr>
<td>Finances</td>
<td>Ms Jillian Blair</td>
</tr>
<tr>
<td>Health &amp; Safety</td>
<td>Dr Wai Kwong Lee</td>
</tr>
<tr>
<td>Web &amp; Communications</td>
<td>Mrs Sandra MacDonald, Mrs Karen Trofimova</td>
</tr>
<tr>
<td>Internationalisation</td>
<td>Dr Christopher Loughrey</td>
</tr>
<tr>
<td>Athena SWAN</td>
<td>Professor Rhian Touyz, Dr Jennifer Logue, Ms Althea Maxwell</td>
</tr>
<tr>
<td>Young Investigator Network (YIN)</td>
<td>Dr Scott Johnstone</td>
</tr>
<tr>
<td>Mentoring</td>
<td>Professor Andrew H. Baker</td>
</tr>
<tr>
<td>BHF Centre of Excellence</td>
<td>Mrs Karen Trofimova</td>
</tr>
<tr>
<td>Clinical/NHS</td>
<td>Dr Robert Lyndsay</td>
</tr>
</tbody>
</table>

**SCIENTIFIC STEERING COMMITTEE**

<table>
<thead>
<tr>
<th>Chair</th>
<th>Professor Rhian Touyz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vascular</td>
<td>Professor Rhian Touyz, Professor Christian Delles, Professor Tomasz Guzik, Professor Andrew H. Baker, Professor Mandy MacLean</td>
</tr>
<tr>
<td>Cardiac</td>
<td>Professor Colin Berry, Professor John McMurray, Professor Godfrey Smith, Professor George Baillie</td>
</tr>
<tr>
<td>Metabolic Disease/Diabetes</td>
<td>Professor Naveed Sattar, Professor John Petrie</td>
</tr>
<tr>
<td>Stroke</td>
<td>Professor Jesse Dawson</td>
</tr>
<tr>
<td>Kidney</td>
<td>Professor Patrick Mark</td>
</tr>
<tr>
<td>-Oomics</td>
<td>Professor Sandosh Padmanabhan</td>
</tr>
</tbody>
</table>

**RESEARCH, KNOWLEDGE EXCHANGE & IMPACT COMMITTEE**

<table>
<thead>
<tr>
<th>Chair</th>
<th>Professor Godfrey Smith</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Professor George Baillie, Professor Naveed Sattar, Professor John McMurray, Professor Joanne Mountford</td>
</tr>
</tbody>
</table>

**OPEN FORUM**

| Chairs                      | Professor Rhian Touyz, Professor Andrew H. Baker |
1.5 Research Themes

CARDIAC RESEARCH

Our cardiac research incorporates basic biology, integrative physiology, and translational and clinical research. Our groups have a diverse range of technical expertise including electrophysiology (basic and clinical), pharmacology (experimental and clinical), physiology (experimental and clinical), imaging (echocardiography, CT, MRI), epidemiology and clinical trials.

Our Principal Investigators are internationally recognised with work done into the mechanisms of disease, including in arrhythmias, congenital heart disease, coronary heart disease, heart failure and public health and also in pulmonary hypertension.

Our clinicians work in tertiary care NHS hospitals in Greater Glasgow and Clyde Health Board and also in the Golden Jubilee National Hospital, which hosts the West of Scotland Heart and Lung Centre and the National Services in Adult Congenital Heart Disease, Advanced Heart Failure and Pulmonary Vascular Disease.

VASCULAR RESEARCH

Our vascular research brings together eleven internationally recognised basic, translational and clinical research group leaders. Our research programmes adopt a wide range of approaches and techniques; from genomics for high throughput SNP genotyping and gene expression profiling, proteomics and molecular/cell biological analysis of vascular cell signalling, through to assessment of vascular physiology and function in animal models and patients. Our goal is to develop an increased understanding of vascular function and the genetic, molecular and cellular level in the laboratory, to identify and validate new targets and translate this knowledge into the clinic by developing innovative therapeutics for treatment of cardiovascular diseases. To achieve this, we are forging collaborative links with colleagues with complimentary expertise in other Research Institutes both within the University and beyond.

Our research programmes are based in state-of-the-art clinical research facilities and dedicated laboratories, ranging from physiology and electrophysiology laboratories to well-equipped molecular and cellular biology laboratories with facilities for sophisticated human and experimental genetic analysis. Capabilities also include high end proteomics and genomics platforms for high throughput SNP genotyping as well as profiling of gene and microRNA expression patterns in disease states, and facilities for the development of novel vascular gene transfer therapies for cardiovascular diseases.

Research Theme Leaders: Professors Christian Delles, Tomasz Guzik, Mandy MacLean and Rhian Touyz

METABOLIC DISEASE & DIABETES RESEARCH

As a group of established Principal Investigators and emerging young researchers, we encourage and foster collaborations within the Institute of Cardiovascular and Medical Sciences, within the University of Glasgow, nationally and internationally.

Our Aims
(i) better understand the mechanisms of cardiovascular and metabolic diseases affecting people with the conditions covered by our clinical specialties (i.e. diabetes, renal disease, endocrine conditions), and the implications for the wider population – including groups defined by ethnicity, gender and deprivation;
(ii) understand the pathways and processes linking obesity and physical inactivity to cardiovascular and metabolic diseases in order to develop better strategies to prevent and treat obesity, and alleviate its metabolic and vascular complications;
(iii) use this knowledge both to develop new cardiovascular therapies and target existing ones more effectively.

Our Expertise
The collective expertise within Metabolic Disease & Diabetes Research Theme spans a full range from molecular and biomarker/“-omic” techniques through clinical investigation to population-level epidemiology, clinical trials and cardiovascular endpoint adjudication. We are leading in establishing disease-specific bio resources linked with routinely-acquired anonymised data from the National Health Service in Scotland.

Research Theme Leaders: Professors John Petrie and Naveed Sattar
**OMICS RESEARCH**

Omics encompasses research fields that use data-intensive methods to map genes, proteins and small molecules, their interactions and their regulation with the ultimate aim of understanding complex biology and disease processes. Traditionally, genes and proteins have been analysed individually, but with the emergence of Omics technologies capable of measuring gene sequence variation, expression and other biomarkers on a global scale this is now the era of high-dimensional biology. Omics naturally leads to big data and navigating and analysing the resulting information deluge is a key challenge for the research community requiring sophisticated bioinformatics, data-science and statistical expertise.

Some of the technologies that have attained a level of maturity in the Omics arena are listed below.

- Genomics - the systematic study of an organism’s genome and differences in DNA sequence between individuals
- Proteomics - the study of all expressed proteins in a cell, tissue or organism and aims to characterise information flow within the cell and the organism, through protein pathways and networks. The proteome is a dynamic reflection of both genes and the environment and is thought to hold special promise for biomarker discovery.
- Metabolomics - the study of global metabolite profiles in a cell, tissue or organism. The metabolome is the final downstream product of gene transcription and is closest to the phenotype of the biological system studied.
- Transcriptomics - the study of the transcriptome - the complete set of RNA transcripts that are produced by the genome, under specific circumstances or in a specific cell, using high-throughput methods, such as microarray analysis
- Glycomics - the study of the structure and function of carbohydrates (sugars) in biological systems
- Lipidomics - the study of cellular lipids

The Omics theme is an evolving and growing collaboration of researchers who use Omics technologies in their research, with the aim to share methods and solutions across themes, assist new researchers into the Omics arena and facilitate the development of an interdisciplinary environment to accelerate discovery science into clinical applications.

**Research Theme Leader:** Professor Sandosh Padmanabhan

---

**RENEAL RESEARCH**

Patients with chronic kidney disease (CKD) have a greatly increased risk of premature cardiovascular disease. This risk is not explained by conventional cardiovascular risk factors such as smoking, high cholesterol or diabetes. For patients with kidney failure requiring dialysis, the risk of cardiovascular disease is even higher, between five and twenty times that of someone of a similar age from the general population with normal kidney function. Receiving a successful kidney transplant improves cardiovascular outcomes as well as quality of life, but does not normalise the risk back to baseline. The Renal Research Theme is developing strategies to reduce this risk and improve outcomes for patients with CKD. We use a number of targeted approaches to address this problem.

These include:

- Laboratory studies of blood vessels to see the effect of CKD on blood vessel function
- Imaging studies of the heart, kidneys, blood vessels and brain to examine sites of cardiac and vascular damage to establish new targets for treatment to reduce cardiovascular risk in CKD
- Collecting blood and urine samples in cohorts of patients with or/at risk of CKD to develop biomarkers of cardiovascular disease which have highest utility in CKD
- Undertaking clinical trials of interventions aiming to reduce cardiovascular risk in CKD
- Interrogating health care data to identify patterns of cardiovascular disease and stroke in patients with CKD

We are interested in the effect of all grades of CKD on cardiovascular risk. This includes the effect of mild CKD on high blood pressure and heart function. Similarly, by studying the heart and blood vessels in patients with kidney failure we aim to improve the understanding of cardiovascular disease in patients needing dialysis or with a kidney transplant and offer new avenues for treatment.

**Research Theme Leader:** Dr Patrick Mark

---

**Research Theme Leader:** Professor Sandosh Padmanabhan
STROKE RESEARCH

Our stroke research group focuses on translational and clinical research into the causes and treatment of stroke. Our Principal Investigators are internationally recognised researchers and hold substantial government, charitable and commercial funding. We have a strong track record of delivering large and high quality clinical studies. Our Principal Investigators have played key roles in shaping the modern approach to treatment.

Our clinical research activities include co-ordination of the Virtual International Stroke Trials Archive (VISTA), Central Adjudication of Modified Rankin Scale scores (CARS), microRNA profiling in ischaemic stroke, development and validation of novel biomarkers, vascular cognitive impairment, upper limb rehabilitation and we run a number of large scale acute and prevention trials. We have in-house data management and biostatistical support. Preclinical research uses animal models exhibiting stroke-associated co-morbidities and a transient model of occlusion with recanalisation. Research is focused around identification of novel treatments targeting mitochondria (in collaboration with the MRC Mitochondrial Biology Unit, Cambridge) or polytherapy approaches through miRNA modulation. Through links with colleagues in INP we have access to state of the art small animal MRI.

We also have a large number of UK and foreign postgraduate taught and research students.

We are co-located between the state-of-the-art BHF Glasgow Cardiovascular Research Centre, the brand new Queen Elizabeth University Hospital and the Glasgow Royal Infirmary. This provides access to state-of-the-art imaging facilities and we admit patients from the whole West of Scotland area.

Research Theme Leader: Dr Jesse Dawson
2. BHF Centre of Research Excellence

2.1 BHF Centre of Research Excellence (CoRE) in Vascular Science & Medicine

The BHF invested £3 million to establish the Institute of Cardiovascular and Medical Sciences (ICAMs) at the University of Glasgow as a new BHF Centre of Research Excellence in Vascular Science & Medicine – helping some of the UK’s best young scientists find new and innovative ways to fight heart disease. The BHF CoRE launched in Glasgow in April 2014 and this report details highlights from the year 2015.

To receive this grant was an outstanding achievement. This has been a very exciting and productive year for our Centre of Excellence. Highlights include research advances, initiation of new training programmes, creation of new core facilities, and partnering with international vascular networks.

The Scientific Framework of the CoRE:

Research axes and projects
1. Immune dysregulation in vascular disease
   - Immune dysregulation of cytokine and chemokine networks in hypertension and vascular dysfunction
   - Resolution of inflammation in HTN and early atherosclerosis
   - Danger signal sensing in the vessel wall in initiation of immune dysregulation
2. Signalling and redox biology of small vessel disease
   - Notch3, signalling and vascular remodelling – molecular insights from patients with CADASIL
   - Redox compartmentalisation, the oxidative proteome and vascular signalling in hypertension
   - VEGF, anti-angiogenic cancer drugs and vascular dysfunction – role in hypertension and thrombosis
3. Early onset vascular disease and socioeconomic status
   - Identifying differential signals of vascular risk in the young at low and high deprivation levels
4. Microvessels, heart disease and pulmonary hypertension.
HIGHLIGHTS

Research advances
Already we have progressed our research which aims to unravel the mysteries behind cardiovascular diseases such as high blood pressure, vascular dementia, stroke, and heart disease, by finding out what causes small and large arteries to become inflamed.

Numerous specific projects studying genes, molecules, animal research and patients are also well under way.

Training the next generation of scientists
Providing the next generation of cardiovascular researchers with a strong training in laboratory and clinical research, from bench-to-bedside, and from bedside-to-bench, is a priority for us.

We have launched two new unique training programmes in the CoRE
1. A 3 year fully-funded PhD in vascular biomedicine for medical doctors, and
2. The Clinical Observership Programme – the opportunity for PhD scientists to shadow top doctors for 5 weeks.

During 2015, two out of seven clinicians were recruited and began their PhD training. Additionally, 4 post-docs successfully completed the first round of the Clinical Observership Programme during the first half of 2015. The programmes are proving to be very successful and with time we will expand them.

Core Facilities
The CoRE has established 3 Core facilities, all of which have become fully functional over the past year. These Core facilities, which are available for use by all researchers in the Institute of Cardiovascular and Medical Sciences, include:
1. Non-invasive clinical vascular phenotyping
2. Myography and imaging Core to assess vascular function and structure in human models of cardiovascular disease.
3. Clinical Trial Core

New partnerships
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 resources, reagents and protocols and opportunities for new grant funds.

In particular, we have established collaborative links with the Canadian Vascular Network (CVN), with the goal of enriching common scientific goals and enhancing training opportunities through student and professorial exchanges.

In April 2015, the BHF CoRE welcomed a delegation from the CVN to Glasgow for a joint scientific meeting. Members of the CVN Leadership spent 2 days with us during which they participated in a multi-faceted agenda of sharing scientific interests and projects, a poster session by ICAMs (pictured opposite) researchers and a closed meeting in which opportunities for future research collaboration were narrowed down and identified.

Specific collaborative projects include:
1. Dendritic cells, hypertension and heart failure
2. Vascular function, biomarkers of cardiovascular disease and preeclampsia
3. Coronary microvessels and heart disease
4. Pulmonary hypertension – phenotyping new models of gender-associated PAH.
Following the Glasgow event, the leadership from both Centres were able to meet again in August 2015 during the European Society of Cardiology (ESC) London event to provide an update of the collaborative projects identified in Glasgow.

Professors Touyz, Delles and Guzik from the BHF Centre of Research Excellence in Glasgow attended the AGM of the CVN in October 2015 to further progress collaborative projects. The ultimate goal of these partnerships is to obtain new funding that will allow development of the proposed projects.

Vascular Primer
In 2015, we initiated the chapter outline and began gathering contributions for the compilation of a “Vascular Primer” handbook, initially designed to function as a basic science handbook for the recruited Clinical Research Fellows. As this project developed, in Nov 2015 the BHF CoRE received a request by Springer to develop this handbook into a textbook for publication. The CoRE will expand this scope of the handbook to include international contributions from our partners and it is set for publication in 2016/2017.

BHF Visit to Glasgow
On Monday 24th August, ICAMS and the BHF CoRE were delighted to host a visit from the CEO of the British Heart Foundation, Mr Simon Gillespie, and BHF Medical Director Professor Peter Weissberg. Professors Anna Dominiczak and Rhian Touyz provided a summary of the innovative research being conducted in the Institute with an interactive poster session, where PIs, postdocs and students presented their latest findings to Mr Gillespie and Prof Weissberg. It was a very enjoyable afternoon and a great opportunity for our research scientists to engage with senior BHF leadership, and to demonstrate the diversity of cardiovascular research currently funded by the BHF in Glasgow.
3. General Information

3.1 Funding

In 2015, the Institute of Cardiovascular and Medical Sciences held 476 active research grants or contracts, with a total value to the Institute of £52.5 million.

The top five funders, by value, of active projects were:

<table>
<thead>
<tr>
<th>Funder</th>
<th>Proportioned value</th>
<th>Total number of awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Heart Foundation</td>
<td>£13,455,620</td>
<td>87</td>
</tr>
<tr>
<td>European Commission</td>
<td>£9,053,338</td>
<td>50</td>
</tr>
<tr>
<td>Medical Research Council</td>
<td>£8,690,435</td>
<td>61</td>
</tr>
<tr>
<td>National Institute for Health Research</td>
<td>£3,961,943</td>
<td>20</td>
</tr>
<tr>
<td>Wellcome Trust</td>
<td>£2,515,709</td>
<td>18</td>
</tr>
</tbody>
</table>

During 2015, the Institute was awarded 114 new projects, with £10.1 million coming to the Institute.

The largest funders for new awards, by value were:

<table>
<thead>
<tr>
<th>Funder</th>
<th>Proportioned value</th>
<th>Total number of awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Institute for Health Research</td>
<td>£2,181,723</td>
<td>8</td>
</tr>
<tr>
<td>Medical Research Council</td>
<td>£2,012,018</td>
<td>19</td>
</tr>
<tr>
<td>Wellcome Trust</td>
<td>£1,131,980</td>
<td>5</td>
</tr>
<tr>
<td>European Commission</td>
<td>£981,878</td>
<td>9</td>
</tr>
<tr>
<td>British Heart Foundation</td>
<td>£956,567</td>
<td>18</td>
</tr>
</tbody>
</table>

Appendix 4.3 contains a list of new grants awarded in 2015 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.
3.2 Publications

Members of the Institute of Cardiovascular & Medical Sciences published a total of 432 manuscripts and 7 books or book chapters during 2015. The full lists of publications are contained in Appendices 4.4 and 4.5. Professors John McMurray and Naveed Sattar and Dr Bill Mullen have consistently been named as highly cited researchers by Thomson Reuters.

### Field-Weighted Citation Impact (FWCI)

* # of citations received by a document
  # expected # of citations for similar documents

Similar documents are ones in the same discipline, of the same type (e.g. article, letter, review) and of the same age. An FWCI of 1 means that the output performs just as expected against the global average; for example, 1.48 means 48% more cited than expected.

<table>
<thead>
<tr>
<th>Researcher</th>
<th>Journal</th>
<th>Paper Title</th>
<th>Times cited</th>
<th>FWCI*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof John McMurray</td>
<td>New England Journal of Medicine</td>
<td>Effect of sitagliptin on cardiovascular outcomes in type 2 diabetes</td>
<td>193</td>
<td>133.71</td>
</tr>
<tr>
<td>Prof John McMurray</td>
<td>New England Journal of Medicine</td>
<td>Angiotensin-neprilysin inhibition versus enalapril in heart failure</td>
<td>377</td>
<td>120.97</td>
</tr>
<tr>
<td>Prof Naveed Sattar</td>
<td>Nature</td>
<td>Genetic studies of body mass index yield new insights for obesity biology</td>
<td>192</td>
<td>78.53</td>
</tr>
<tr>
<td>Prof Dame Anna Dominiczak</td>
<td>Lancet</td>
<td>Effect of treatment delay, age and stroke severity on the effects of intravenous thrombolysis with alteplase for acute ischaemic stroke: a meta-analysis of individual patient data from randomised trials</td>
<td>197</td>
<td>63.21</td>
</tr>
<tr>
<td>Prof John McMurray</td>
<td>Circulation</td>
<td>Angiotensin receptor neprilysin inhibition compared with enalapril on the risk of clinical progression in surviving patients with heart failure</td>
<td>72</td>
<td>46.1</td>
</tr>
</tbody>
</table>

**11.7%** of ICAMS papers are in the top 1% most highly cited papers worldwide  

**59%** of ICAMS papers are in the top 10% most highly cited papers worldwide  

**27.7%** of ICAMS papers are in the top 5% most highly cited papers worldwide  

ICAMS researchers are cited 4 times more than the worldwide average
4. Sharing Knowledge

4.1 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 35 countries across the world:

Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Denmark, Egypt, Finland, France, Germany, Greece, India, Ireland, Israel, Italy, Japan, Kuwait, Malaysia, Netherlands, New Zealand, Norway, Poland, Russia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Turkey, United Arab Emirates, United Kingdom, United States of America
4.2 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.

4.3 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 2015, there were 129 postgraduate research students registered in the Institute of Cardiovascular and Medical Sciences: 111 students were studying for Doctorate of Philosophy (PhD), 18 for Doctorate of Medicine (MD). During 2015, 13 students were awarded doctorates: 9 PhD, 4 MD, current PhD students are listed in Appendix 4.6 and current MD students are listed in Appendix 4.7.

4.3.1 Awarded Postgraduate Research Degrees in 2015

**DOCTORATE OF MEDICINE (MD)**

- **Adeipo Adesokan, Thesis:** "Novel dimeric aporphine alkaloids from the West African medicinal plant, Enantia Chlorantha are potent anti-trypanosomal agents"

- **Lindsey McLure, Thesis:** "The role of cardiac resonance imaging in the assessment of right ventricular function in pulmonary hypertension"

- **Ify Mordi, Thesis:** "The Clinical Utility of Cardiovascular Magnetic Resonance"

- **John Paul Rocchiccioli, Thesis:** "Hydralazine in heart failure: a study of the mechanism of action in human blood vessels"

**DOCTORATE OF PHILOSOPHY (PHD)**

- **Sultan Al-Suhaim, Thesis:** "Use of evidence based pharmacotherapy for cardiovascular disease in Scotland"

- **Christopher Breen, Thesis:** "The role of miRNAs in stroke"

- **David Carrick, Thesis:** "Myocardial haemorrhage revealed by MRI mapping in acute ST-elevation myocardial infarction: relationships with heart function and health outcomes"

- **Alistair Church, Thesis:** "The critical role of p38 Mitogen Activated Protein Kinase (MAPK)-alpha in pulmonary hypertension: linking inflammation with pulmonary vascular remodelling."

- **Mohammed Dashti, Thesis:** "Integrated genome sequencing and gene expression in the stroke-prone spontaneously hypertension rat"

- **Craig Livie, Thesis:** "Determining the role of PDE2 within the mitochondria"

- **Muhammad Malik, Thesis:** "Insulin resistance, ethnicity and cardiovascular risk"

- **Linsay McCallum (nee Lappin), Thesis:** "Investigation of a role for GPR35 as a novel therapeutic target in cardiovascular disease"

- **Elizabeth Scott, Thesis:** "Derivation of vascular endothelium from human embryonic stem cells: the role of microRNAs in endothelial differentiation and commitment"
4.4 Postgraduate Teaching

In the 2015-2016 term, the Institute ran a new programme, MSc Clinical Trials & Stratified Medicine gla.ac.uk/postgraduate/taught/clinicaltrialsstratifiedmedicine/ We also launched an online Sport & Exercise Science and Medicine MSc programme. This was developed to make the programme accessible to a wider student pool, allowing students who work full-time or are unable to come to Glasgow to study the chance to study this dynamic and exciting degree programme."

We had 127 registered PGT students in the 2014-2015 academic year and 144 registered PGT students in the 2015-2016 academic year. This represented an increase of 17 (13%) students on the previous academic year. 53 of the 2015-2016 students were international, with the MSc (Med Sci) Clinical Pharmacology programme attracting the highest number of international students.

<table>
<thead>
<tr>
<th>Programme</th>
<th>Home</th>
<th>International</th>
<th>Total</th>
<th>Change Since 2014-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSc Stratified Medicine &amp; Pharmacological Innovation</td>
<td>35</td>
<td>0</td>
<td>35</td>
<td>+8</td>
</tr>
<tr>
<td>MSc Sport &amp; Exercise Science and Medicine</td>
<td>19</td>
<td>10</td>
<td>29</td>
<td>-6</td>
</tr>
<tr>
<td>MSc (Med Sci) Cardiovascular Sciences</td>
<td>7</td>
<td>7</td>
<td>14</td>
<td>+3</td>
</tr>
<tr>
<td>MSc (Med Sci) Diabetes</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>-1</td>
</tr>
<tr>
<td>MRes Translational Medicine</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>MRes Integrative Mammalian Biology</td>
<td>3</td>
<td>22</td>
<td>25</td>
<td>-7</td>
</tr>
<tr>
<td>MSc (Med Sci) Clinical Pharmacology</td>
<td>3</td>
<td>22</td>
<td>25</td>
<td>+5</td>
</tr>
<tr>
<td>MSc Clinical Trials &amp; Stratified Medicine</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>+5</td>
</tr>
<tr>
<td>MSc Sport &amp; Exercise Science &amp; Medicine (Distance Learning)</td>
<td>9</td>
<td>7</td>
<td>16</td>
<td>+16</td>
</tr>
</tbody>
</table>
MSC STRATIFIED MEDICINE & PHARMACOLOGICAL INNOVATION WINS AWARD

Our MSc Stratified Medicine & Pharmacological Innovation was awarded the “Outstanding Employer Engagement” award at the inaugural Herald Higher Education Awards held on Thursday 16th July at the Grand Central Hotel, Glasgow. The awards, organised by The Herald newspaper in association with the University of the West of Scotland, celebrate the impact colleges and universities have on national life and their role in society. Professor Anton Muscatelli, Principal and Vice-Chancellor (University of Glasgow), said: “The Outstanding Employer Engagement award recognises our efforts to train a new generation of medical scientists to develop innovative, more effective forms of personalised medicine.”

POSTGRADUATE OPEN DAY

The University of Glasgow’s Postgraduate Open Day took place on Friday 20th November. It was well-attended and the feedback received was very positive.

Feedback

The following feedback was received from students:

“I enjoyed this postgraduate taught master a lot, I am also satisfied with the level of the courses, they challenge us but still keep it on an understandable level. Most of our teachers were very good both in explaining and keeping us interested. I appreciated the interactive lectures most.” MSc (Med Sci) Clinical Pharmacology

“The quality of research that is being done here in Glasgow is astounding and inspiring to be a part of. Thus my lecturers are absolute experts in their field and are on the cutting edge of Diabetes and Cardiovascular research.” MSc (Med Sci) Diabetes

“There were very interesting lectures with lecturers who engaged well. All topics were relevant and I feel they will all be beneficial for future practice. Assessments were fair and gave good opportunity to show what we had learnt” MSc Sport & Exercise Science and Medicine

“The new facilities at the Queen Elizabeth University Hospital Teaching & Learning Centre – Stratified Medicine Scotland are excellent” MSc Stratified Medicine & Pharmacological Innovation
4.5 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 an environment for them to focus on their training and career 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.

The Fellows Network creates a cross-disciplinary network of early career fellows/new lecturers which 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 & Engineering.

As part of the BHF Centre of Excellence Award, the Clinical Experience Programme was created for Non-clinical Cardiovascular Scientists, where the aim is to contextualise basic science by providing a five 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.

4.6 Educational Events

The Institute of Cardiovascular and Medical Sciences hosts regular educational meetings. Over 2015, there were numerous presentations by invited speakers as well as seminars and symposia.

Guest Lectures in 2015 included:

- Debunking Junk in the Human Genome (Professor Joseph Miano, University of Rochester)
- 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, Cambridge)
- Collagen VI myopathies: pathogenic mechanisms and therapeutic perspectives (Professor Paolo Bonaldo, University of Padova)
- How mitochondria produce ROS during ischaemia-reperfusion injury (Dr Mike Murphy, Cambridge)
- Cerebral small vessel disease and COL4A1/A2 (Professor Elisabeth Tounier-Lasserve, 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 a therapy (Dr Scott Solomon, Brigham and Women’s Hospital – Harvard)
- The Clinical Application of Metabolomics (Professor Louise Kenny, Cork University)
- Redox sensing and signalling in the cardiovascular system (Professor Phil Eaton, Kings College London)
- Non-coding RNAs in cardiovascular disease (Professor Stefanie Dimmeler, Goethe University Frankfurt)
- Therapeutic immunomodulation of atherosclerosis. (Professor Johan Kuiper, The Netherlands)
- 3D Printing, robotics, and integrated systems for chemistry, synthetic biology and medicine (Professor Lee Cronin, University of Glasgow)
- Novel G protein-coupled receptor targets for pulmonary arterial hypertension (Dr Fiona Murray, University of Aberdeen)
• Dissecting the Mechanisms of Atrial Fibrillation and The Role of Computer Modelling to Solve a Clinical Problem (Dr Michael Colman, University Of Manchester)
• Hypoxia and oxygen sensors in atherosclerosis (Dr Judith Sluimer, Maastricht University Medical Center)
• The role of dedifferentiated cardiomyocytes in the diseased myocardium (Professor Thomas Braun, Max-Planck-Institute for Heart and Lung Research)
• How can human genetics inform our understanding of the aetiology and treatment of type 2 diabetes and insulin resistance? (Prof Robert Scott, University of Cambridge)
• Sodium Chloride - An Interesting Regulator of Immune Cell Function (Dominik N Müller, Max-Delbrück-Centre)
• Title Lost in translation … miRNA 126-3p a modulator of perivascular cell activation on matrix substrates. (Dr Bent Brachvogel, University of Cologne)
• Basement membrane diseases - the paradigm of epidermolysis bullosa (Prof Leena Bruckner-Tuderman, University Hospital Freiburg)
• Sympathetically-mediated resistant hypertension – current concepts, new perspectives (Dr Dagmara Hering, University of Western Australia)
• The Effect of Pulmonary Hypertension on Exercise Performance in Human Subjects (Dr David Systrom, Harvard Clinical and Translational Science Center Brigham and Women's Hospital Pulmonary and Critical Care)
• Tales from the genomic frontier (Dr Euan Ashley, Stanford Center for Inherited Cardiovascular Disease)
• AMPK, a multifaceted therapeutic target (Dr Benoit Viollet, Université Paris Descartes)
• Hypertension, CVD development and mortality in rapidly urbanising Africans: A review of the latest findings from South Africa (Professor Alta Schutte, North-West University, South Africa)
• Development of hemodynamic targeted theranostic nanoparticles for the prevention of atherosclerosis (Dr Lucas Hofmeister, Vanderbilt University)
• Oxidation, inflammation and hypertension (Professor David Harrison, Vanderbilt University, Nashville)
• Science, Art and Drug Discovery, A Personal Perspective (Professor, Sir Simon Campbell CBE FRS (Retired – Former SVP for WW Discovery at Pfizer)
• NADPH oxidases and cardiac stress responses (Professor Ajay Shah, Kings College London)
• Stepstones towards understanding renal magnesium handling (Professor René Bindels, Radboud Institute for Molecular Life Sciences.)
• Obesity as a risk factor of cardiometabolic and brain health in adolescence (Professor Zdenka Pausova, University of Toronto)
• How Genes and Environment Shape the Adolescent Brain (Professor Tomáš Paus, University of Toronto)
• Immunity, vascular inflammation and atherosclerosis (Professor Goran Hansson, Karolinska Institutet)
• Update in preeclampsia, linking Hypertension and immunology – view from a cardiologist. (Professor Ralf Dechend, Charité – Universitätsmedizin Berlin)
• Role of tyrosine phosphatases in metabolism and inflammation (Dr Mirela Delibegovic, The Institute of Medical Sciences, Aberdeen)
5. Using Knowledge

5.1 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.”

5.2 Public Engagement Activities

WORLD HYPERTENSION DAY 2015
Hypertension remains the major cause of morbidity and mortality worldwide and sadly the prediction is that this will get worse over the next 15 years. Since hypertension causes heart disease, stroke, kidney failure and dementia, which are all chronic diseases that pose a major burden to our society from a health, economic and societal point of view we have a major challenge as health care providers. A major goal of the International Society of Hypertension and the World Hypertension League is to promote public awareness. As such the world celebrated World Hypertension Day on the 17th May 2015.

Here at the University of Glasgow the Institute of Cardiovascular and Medical Sciences organised an event on May 15th 2015 encouraging everyone to have their blood pressure measured and for them to ‘know their numbers’. The event was held at “One A The Square” in the main University building.
The event attracted an enormous amount of interest with both staff and students getting their blood pressure measured and obtaining advice on cardiovascular healthy living.

We recognise that making individuals aware of their blood pressure should be part of healthy living and not just something that is measured once every year on World Hypertension Day. To this end, we in Glasgow will strive hard to continue to keep the campaign of ‘knowing your numbers’ an ongoing priority in the community through education, publicity and public outreach.

**ORGANISERS**
Rhian Touyz, Linsay McCallum, Sandosh Padmanabhan

**VOLUNTEERS**
Medical Students: Angela Boal, Jaclyn Carberry, Arren Mander, Ashleigh Ward
BHF PhD students: Lauren Fleming, Emma Louise Low, Hannah Martin, Heather Small
PhD students: Nur Aishah Che Roos, MohammedAlsieni
NHS: Fiona Porteous, Ammani Brown, Margaret McFadden, Paul Scouller, Dominic Rimmer
VISIT BY MEMBERS OF SCOTTISH PARLIAMENT

ICAMS were asked by James Cant, Director of BHF Scotland & Sheghley Ogilvie, Policy & Public Affairs Assistant, BHF Scotland to host an afternoon for a number of elected members of the Scottish Parliament. This was an opportunity for clinicians and researchers to talk about BHF funded research carried out at the Institute and how this work was helping to fight the battle against cardiovascular disease.

On Friday 2nd October 2015, members of the Scottish Parliament visited the BHF Cardiovascular Research Centre. Professor Rhian Touyz, Director, welcomed our visitors and gave an overview of the research work we were doing and where we wanted to go in the future. She also thanked the BHF for their continued support and paid tribute to the millions of fundraisers.

A number of researchers and PhD students presented posters on their current projects. A lively discussion followed on health policy and how good practice could be integrated into the daily life of the population. Prof Touyz mentioned her desire to have blood pressure monitors in every supermarket in the country to help the population manage their own BP. Our visitors then had a tour round the BHF Cardiovascular Research Centre. Dr Kenneth Mangion, Clinical Research Fellow in Imaging, gave them a tour of the MRI Imaging Suite. He showed them a number of test scans of hearts which had suffered a heart attack. The visitors were visibly impressed by the power of this diagnostic tool which was funded by a BHF Award a few years ago. He also discussed a number of research projects that had been awarded as a result of data gathered following this initial funding.

The group also visited the 3rd and 4th floor labs, giving them the chance at a close-up view of science in action. Our visitors included: Patrick Harvie, MSP; Hanzala Malik, MSP; Anne McTaggart, MSP; Drew Smith, MSP; Margaret Ferrier, MP; Patrick Grady, MP; Natalie McGarry, MP; John McNally, MP; Carol Monaghan, MP; James Cant, BHF; Sheghley Ogilvie, BHF.

EXPLORATHON

A special Café Scientifique was held in the Tinderbox in Ingram Street on the 25th September as part of Glasgow’s Exporathon public engagement events. For an overview of Exporathon 2015, featuring this event see: https://youtu.be/8JDPMdJbJal. Prof Rhian Touyz talked to the public about high blood pressure and why it is so important that we know what our blood pressure is. The discussion was facilitated by Prof Mandy MacLean and the broadcaster Vanessa Collingridge. During the break the public had an opportunity to have their blood pressure taken by an ICAMS PhD student Sukainah Al Alshaikh and Dr Jesse Dawson. It was a very interactive and successful event.

CAFÉ WITH HEART

ICAMS wishes to reach out to the community of The West End and explain our research in the context of local health issues. To facilitate this, we will be rolling out regular ‘Café style’ public engagement events in Waterstones bookstore on Byres Road, starting in November this year. Due to the success of Rhian’s talk at Exporathon we are starting with ‘high blood pressure’ but future events will cover areas of interest to the public including diabetes, obesity, exercise and lifestyle choices.

A question of science 2015: success for Glasgow University Public Engagement Group. The fifth annual A Question of Science Quiz made its return to Glasgow Science Centre on Thursday 22nd of October. 27 tables competed and Glasgow University’s public engagement table, including ICAMS public engagement champion Mandy MacLean, won the trophy! The team won the trophy in 2013 but lost it to Strathclyde in 2014 so were delighted to win it back! The evening was hosted by the comedian Fred McAulay and world-renowned sport scientist Professor Greg Whyte OBE was the guest of honour. Greg has worked with David Walliams, Davina McCall and Eddie Izzard amongst others to make ‘ordinary people achieve the impossible’ in amazing feats of sporting achievement and endurance.
CARDIOVASCULAR RESEARCH AT THE EXPLORATHON NIGHT AND THE MIDLOTHIAN SCIENCE FESTIVAL

A group of researchers lead by Dr Gianluca Grassia portrayed the importance of studying cardiovascular disease at two recent large public engagement events in Scotland. The team aim to investigate how nanoparticles could be used to improve the diagnosis and treatment of atherosclerosis as part of joint Glasgow/Strathclyde University projects supported by the Engineering and Physical Sciences Research Council (EPSRC) and European Commission.

On Friday 25th September 2015, the group contributed to the ‘Explorathon’ night at the Glasgow Science Centre (photo above), an extravaganza of discovery and entertainment to celebrate European Researchers’ Night. On Wednesday 14th October 2015 the group contributed to the Midlothian Science Festival, designed to provide an entry point for local people to engage with science. Over 3000 members of the public attended both events. Our station interacted with 500 children and adults.

Dr Pasquale Maffia, member of the BHF Centre of Excellence in Vascular Science and Medicine, said: “We will use nanoparticles that can be tagged onto antibodies, which possess the ability to recognise inflammatory markers. The nanoparticles can then be detected by a technique called Surface Enhanced Raman Scattering, whereby a light source is shone on the nanoparticles, transferring energy and causing them to vibrate. The vibrations could be exploited to develop a highly-sensitive means of measuring inflammation in atherosclerotic vessels”.

Both children and adults were invited to select either a plastic or magnetic nanoparticle that was inserted into a hyper-realistic artery. Magnetic nanoparticles were attracted to magnets embedded in the large plaque, while plastic nanoparticles passed by. Researchers reinforced the notion that the magnetic nanoparticles were specific for “bad” aspects of the plaque, thus allowing scientists to identify and treat the lesions. Children were also invited to play a specifically-designed computer game, and to create their own “good” or “bad” cell from clay, paint it and take it home as a souvenir.
5.3 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.

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 hospitalisation 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); 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 Research Fellow [2010–present]); James McIlknap (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 ongoing 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).
6. Appendices

6.1 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 Polizer 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 recognised expert in the field of cardiology, he was, in 2006, recognised 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.
Professor Mandy MacLean has been shortlisted in this year’s WISE Awards. The annual WISE Awards celebrate the work of individuals and organisations who are leading the way for women in science, technology, engineering and maths (STEM).

Record numbers of entries were received from women and organisations working in the UK’s STEM sector. Mandy has been shortlisted for the research award which celebrates excellence in scientific research or other technical field. All nominees were invited to attend an interview with the judges. Mandy said: “I was delighted and honoured to hear that I have been shortlisted for this award. To be amongst such incredibly inspirational women at the interview was indeed inspirational in itself!”

The winners will be announced at an awards ceremony in London on 12 November. WISE Director Helen Wollaston said: “I was blown away by the passion, energy, commitment and sheer dogged determination of the girls and women we met at the interviews. They are shining examples of talent which is changing the face of the UK’s science, technology and engineering industries, to keep us at the forefront of global innovation and make the world a better place”.

Dr Terry Quinn (Clinical Lecturer in Stroke/Geriatric Medicine) has been awarded the 2015 Stroke Association / Chief Scientist Office Clinical Senior Lecturer Fellowship. The award will allow Terry to develop and expand his research programme around describing stroke outcomes, stroke trial methodology and post-stroke psychological problems.

Terry was presented his award by Professor Sir Mark Walport (Government Chief Scientific Adviser) and Lady Estelle Wolfson on behalf of the Stroke Association at a ceremony held in the opulent surroundings of Lancaster House. However, there was little time to celebrate as the next morning Terry had to deliver a lecture on his work at the British Association of Stroke Physicians meeting in Leicester. Terry commented “Glasgow has a track record of excellence in stroke research and I hope to use this award to continue the proud tradition. I am grateful to all my collaborators, mentors and friends in ICAMS and other Institutes. Thank you for your support and encouragement and I look forward to continuing to work with you in this fascinating and clinically important field of research”.

Stroke Association/CSO Clinical

SENIOR LECTURER FELLOWSHIP

Dr Terry Quinn (Clinical Lecturer in Stroke/Geriatric Medicine) has been awarded the 2015 Stroke Association / Chief Scientist Office Clinical Senior Lecturer Fellowship. The award will allow Terry to develop and expand his research programme around describing stroke outcomes, stroke trial methodology and post-stroke psychological problems.

Terry was presented his award by Professor Sir Mark Walport (Government Chief Scientific Adviser) and Lady Estelle Wolfson on behalf of the Stroke Association at a ceremony held in the opulent surroundings of Lancaster House. However, there was little time to celebrate as the next morning Terry had to deliver a lecture on his work at the British Association of Stroke Physicians meeting in Leicester. Terry commented “Glasgow has a track record of excellence in stroke research and I hope to use this award to continue the proud tradition. I am grateful to all my collaborators, mentors and friends in ICAMS and other Institutes. Thank you for your support and encouragement and I look forward to continuing to work with you in this fascinating and clinically important field of research”.

6.2 Honouring Staff

MANDY MACLEAN SHORTLISTED FOR WISE RESEARCH AWARD

Professor Mandy MacLean has been shortlisted in this year’s WISE Awards. The annual WISE Awards celebrate the work of individuals and organisations who are leading the way for women in science, technology, engineering and maths (STEM).

Record numbers of entries were received from women and organisations working in the UK’s STEM sector. Mandy has been shortlisted for the research award which celebrates excellence in scientific research or other technical field. All nominees were invited to attend an interview with the judges. Mandy said: “I was delighted and honoured to hear that I have been shortlisted for this award. To be amongst such incredibly inspirational women at the interview was indeed inspirational in itself!”

The winners will be announced at an awards ceremony in London on 12 November. WISE Director Helen Wollaston said: “I was blown away by the passion, energy, commitment and sheer dogged determination of the girls and women we met at the interviews. They are shining examples of talent which is changing the face of the UK’s science, technology and engineering industries, to keep us at the forefront of global innovation and make the world a better place”.

Dr Terry Quinn

Professor Mandy MacLean
DR KATE STEVENS AWARDED 2015 ERA STANLEY SHALDON AWARD FOR YOUNG INVESTIGATORS

We are pleased to announce that Dr. Kate Stevens, Clinical Lecturer in Nephrology in ICAMS, is the recipient of the 2015 European Renal Association (ERA) Stanley Shaldon Award for Young Investigators awarded to the best young author of abstracts presented during the past three ERA-EDTA Congress. This was awarded at the end of May at the ERA Congress in London.

This highly prestigious award recognizes the fantastic translational science Kate has undertaken looking at the effects of phosphate on vascular and endothelial function with a view to better understanding its mechanism of action as a cardiovascular risk factor. This work was funded by a BHF Junior Clinical Training Fellowship. The Renal Group are really proud of this award and we would like to thank all of our colleagues in ICAMS who have contributed to this work.

THE HARRIET DUSTAN AWARD

Professor Rhian Touyz has received a prestigious awarded by the American Heart Association (AHA). Rhian is Director of the Institute of Cardiovascular and Medical Sciences.

The Harriet Dustan Award is designed to recognise female investigators who have made outstanding contributions in the field of hypertension. This award was established to honor the memory of Dr. Harriet Dustan, an outstanding clinician and investigator who was a tireless worker on behalf of the Council on Hypertension and the American Heart Association for over 50 years.

In addition to her numerous career achievements, Dr. Dustan served the AHA as president, chaired its Ethics and Research Committees and was the founding Editor-in-Chief of Hypertension.

WELLCOME TRUST INTERMEDIATE CLINICAL FELLOWSHIP

Dr Rachel Myles, Clinical Lecturer in Cardiology at the Institute of Cardiovascular & Medical Sciences has been awarded an Intermediate Clinical Fellowship by the Wellcome Trust to continue her research into the mechanisms of ventricular arrhythmias following myocardial infarction. Rachel’s research project, entitled “Heterogeneity of sympathetic stimulation as a mechanism of ventricular arrhythmias following myocardial infarction” will build on existing collaborations with research teams at the University of Leicester and the University of California, Davis to investigate the role of the autonomic nervous system in modulating cardiac electrophysiology to produce these life-threatening arrhythmias.
6.3 Research Awards (proportioned value)

New grants awarded in 2015 on which Institute members were investigators. The funding stated is the proportioned amount for investigators from the Institute of Cardiovascular & Medical Sciences, for some grants, may be less that the total amount awarded. The list does not include any grants which are confidential in nature and excludes grants where the total proportioned value for ICAMS was less than £10k.

A randomised parallel group double blind placebo-controlled trial of low dose adjunctive alteplase during primary PCI (T-Time), National Institute for Health Research, £1,762,806.98, PI- Prof Colin Berry, CoPIs- Dr Aleksandra Radjenovic, Prof Naveed Sattar, Prof Peter Macfarlane, Dr Keith Oldroyd

Heterogeneity of sympathetic stimulation as a mechanism of ventricular arrhythmia following myocardial infarction, Wellcome Trust, £921,102.97, PI- Dr Rachel Myles

Glasgow Molecular Pathology (GMP) Node, Medical Research Council, £754,557.39, CoPIs- Prof Rhian Touyz, Prof Anna Dominiczak, Prof Naveed Sattar, Prof Matthew Walters

ENSAT-HF, European Commission, £549,092.20, PI- Prof Eleanor Davies, CoPIs- Dr Scott Mackenzie, Dr Marie Freel, Dr John McClure

UK Quantum Technology Hub in Enhanced Quantum Imaging, Engineering & Physical Sciences Research Council, £489,911.22, CoPI- Prof Matthew Walters

SRP Complex Reviews Research Support Unit, National Institute for Health Research, £418,915.92, CoPIs- Prof Peter Langhorne, Dr Terence Quinn, Prof David Stott

Investigating the role of RUNX1 in the heart post-myocardial infarction, Medical Research Council, £410,892.53, PI- Dr Christopher Loughrey, CoPIs – Prof Godfrey Smith, Dr Martin McBride, Dr Stuart Nicklin

REMOVAL study: Reducing with Metformin microvascular Outcomes and Vascular complications in T1DM, Juvenile Diabetes Foundation, £385,739.15, PI- Prof John Petrie, CoPI- Prof Naveed Sattar

Afib-TrainNet, European Commission, £373,051.40, PI- Prof Godfrey Smith, CoPI – Dr Antony Workman

Cardiac biomarkers and the prediction of CVD in Scotland, Scottish Executive Health Department, £289,930.33, PI- Dr Paul Welsh, CoPI- Prof Naveed Sattar, Dr David Preiss

Engineered 2D & 3D hiPSC-CM platforms to detect cardiovascular safety liabilities, National Centre for Replacement, Refinement, and Reduction, £284,783.98, PI- Prof Godfrey Smith
Evaluating the safety & efficacy of a novel preclinical therapy that bridges to clinical application, by assessing the regeneration of damaged renal tissue within donor kidneys, Medical Research Council, £259,999.47, PI- Mr Marc Clancy, CoPIs- Dr Patrick Mark, Prof Rhian Touyz

Ancestry and biological informative markers for stratification of hypertension – The AIM HY study, Medical Research Council, £254,090.25, PI- Prof Sandosh Padmanabhan

A prospective comparison of the diagnostic utility of invasive coronary physiological indices and quantitative perfusion MRI in patients with coronary heart disease…, British Heart Foundation, £226,443.00, PI- Dr Keith Oldroyd, CoPIs- Prof Colin Berry, Dr Aleksandra Radjenovic, Dr John McClure

The role of sarcoplasmic reticulum calcium in the generation of early after-depolarisations and ventricular arrhythmias in the long QT syndrome, British Heart Foundation, £182,704.11, PI- Dr Rachel Myles, CoPI- Prof Godfrey Smith

Investigating oestrogen metabolism in pulmonary artery smooth muscle cells, British Heart Foundation, £178,845.00, PI- Prof Margaret MacLean

CORE SNBTS Agreement – Tissue and Cellular Therapies Theme Group, Scottish National Blood Transfusion Service, £154,998.00, PI- Dr Joanne Mountford

KRUK Fellowship: Understanding and reducing the risk of cerebrovascular disease in patients with end stage renal disease; from the patient to the population, Kidney Research UK, £144,295.18, PI- Dr Mark Findlay, CoPIs-Dr Patrick Mark, Dr Jesse Dawson

SPECTRE Study: Combined Suppression of cholesterol bioavailability and androgen de novo synthesis to treat castrate resistant prostate cancer, Prostate Cancer UK, £139,038.66, CoPIs- Prof Christian Delles, Dr Jason Gill

MICA: Development of a software application for detection and monitoring of attentional deficits in delirium, Medical Research Council, £136,248.12, PI- Prof David Stott

MISTIE III, National Institute of Health, £122,565.63, PI- Prof Kennedy Lees, CoPI- Dr Jesse Dawson

MRC APBI Stratification and Extreme Response Mechanism IN Diabetes – MASTERMIND (MRC Stratifying Medicine Pilot), Medical Research Council, £113,991.80, PI- Prof Naveed Sattar, CoPI- Dr Robert Lindsay

Myocardial strain measurements in survivors of acute ST-elevation myocardial infarction: implementation and prognostic significance of novel magnetic resonance imaging methods, British Heart Foundation, £64,941.25, PI- Prof Colin Berry, CoPI- Dr Aleksandra Radjenovic

Investigating the mechanisms of low-voltage defibrillation and its application to the human ventricle to facilitate its translation into the clinic, British Heart Foundation, £59,085.00, PI- Prof Godfrey Smith

Vitamin K therapy to improve vascular health in patients with Chronic Kidney Disease – a randomised controlled trial, British Heart Foundation, £57,109.01, PI- Dr Patrick Mark

Regulation of Anti-inflammatory Gene Expression in Vascular Endothelial Cells by EPAC1, British Heart Foundation, £55,963.00, CoPIs- Dr Timothy Palmer, Prof George Baillie

Validation of the PDE4D7 interactome, Prostate Cancer UK, £49,977.21, PI- Prof George Baillie

British Regional Heart Study (BRHS): a long-term prospective investigation of cardiovascular disease (causes, pathways, prediction, and prevention) among older British men, British Heart Foundation, £48,400.01, PI – Dr Paul Welsh, CoPI- Prof Naveed Sattar

Understanding the associations of physical activity and sedentary behaviours on established and novel markers of cardiovascular risk in older age, British Heart Foundation, £47,355.00, PI- Dr Paul Welsh, CoPI- Prof Naveed Sattar

InPreSD, European Commission, £41,518.15, PI- Dr Jason Gill, CoPI- Prof Naveed Sattar

Testing Emotionalism After Stroke (TEARS), The Stroke Association, £36,618.40, PI- Professor Matthew Walters

BHF Chair of Translational Cardiovascular Sciences, British Heart Foundation, £35,721.51, PI- Prof Andrew Baker

Seniors – understanding sedentary behaviour, Medical Research Council, £33,579, CoPIs- Dr Jason Gill, Prof Naveed Sattar

Pathway-driven identification of therapeutic targets for combating Alzheimer’s disease, Medical Research Council, £30,295.46, PI- Prof George Baillie
Urinary proteomic profile as a biomarker for preclinical Dementia and cognitive ageing, Academy of Medical Sciences, £30,000.00, PI- Dr William Mullen

MRI Brain Scan and Reporting, Bristol Myers Squibb Pharmaceuticals Ltd, £28,200.00, PI- Dr Terence Quinn, CoPI- Dr Jane Cannon

NIH DOHaD mechanisms Glasgow, National Institutes of Health, £25,735.70, CoPI- Prof Naveed Sattar

Is statin use associated with care-home admission: Describing care-home admission as a novel study “outcome” using long-term follow-up of trial participants and screenees, Scottish Executive Health Department, £20,675.97, PI- Dr Terence Quinn, CoPI- Prof David Stott

Manipulating the activity of the gut microbiota with fermentable carbohydrates to maximise the bioavailability of bioactive phenolic acids for health, Biotechnology and Biological Sciences Research Council, £25,089.80, CoPI- Dr William Mullen

CiC: Small molecules targeting the PDE4A4-p75NTR interaction, a novel target for fibrotic diseases, Medical Research Council, £18,363.00, PI- Prof George Baillie

DEXLIFE: Mechanisms of prevention of type 2 diabetes by lifestyle intervention in subjects with pre-diabetes or at high-risk for progression, European Commission, £18,216.39, PI- Prof John Petrie

Longitudinal strain in patients admitted to hospital with heart failure: diagnostic utility and prognosis prediction, NHS Greater Glasgow & Clyde, £17,360.14, PI- Dr Ross Campbell, CoPI- Prof John McMurray

Mapping the incidence and outcomes of acute kidney injury associated with angiotensin converting enzyme inhibitors using prescribing records, Scottish Executive Health Department, £16,713.46, PI- Dr Patrick Mark

Starfish in Stroke – RCT, Chest, Heart & Stroke Scotland, £13,499.86, CoPI- Dr Jason Gill

Assessing Cognitive Function and Measuring Cerebral Circulation on HaemoDialysis (ACUMEN-HD), Darlinda’s Charity for Renal Disease, £12,409.00, PI- Dr Mark Findlay, CoPI- Dr Patrick Mark, Dr Jesse Dawson

ISSF Catalyst: Global regulation of gene expression in the Thick Ascending Limb of the Loop of Henle by TNF: implications for salt-uptake and blood pressure regulation, Wellcome Trust, £10,877.00, PI- Mrs Lesley Graham, CoPIs- Dr Martin McBride, Prof Sandosh Padmanabhan

The derivation and validation of a short form Barthel Index of Activities of Daily Living Scale, NHS Greater Glasgow & Clyde, £10,177.00, PI- Dr Terence Quinn
6.4 Publications


Publications


Publications


64. Cannon JA, McKean AR, Jhund PS, and McMurray JJV. What can we learn from RELAX-AHF compared to previous AHF trials and what does the future hold? *Open Heart*. 2015;2(1):000283.


89. Cotter G, Davison BA, Millo O, Bourge RC, Cleland JG, Jondeau, Get al. Predictors and Associations With Outcomes of Length of Hospital Stay in Patients With Acute Heart Failure: Results From VERITAS. Journal of Cardiac Failure. 2015;S1071-9164(15):01248-8. [Epub ahead of print 22 December 2015]


**Publications**


172. Jhund PS. Heart failure management: continuing to fail or signs of success? **Cardiovascular Drugs and Therapy.** 2015;29(1):5-6.


3. McMurray JJ. It is BEAUTIFUL we should be concerned about, not SIGNIFY: is ivabradine less effective in ischaemic compared with non-ischaemic LVSD? European Heart Journal. 2015;36(31):2047-2049.


Publications


Publications


Publications


6.5 Book sections and chapters


6.6 PHD STUDENTS

Izah Nur Ab Razak
Faris Fahad A Aba Alkhayl
Maram Hussen Abduljabbar
Emma Aitken
Sukainah Al Alshaikh
Nasser Mohammed Aldekhail
Cherry Alexander
Noor Afailakawi
Husam Alganga
Jahad Alghamdi
Nora Hassan Alharbi
Faridah M E E Alkandari
Andrew Allan
Tarek Almabrouk
Nasser Abdullah S Alotaq
Abdulaziz Alqadi
Tahani Al-Rammah
Safaa Mohammed M Alsanosi
Bushra Ali A Alsfouk
Mohammed Alsieni
Stephanie Anderson
Margaret Dickson Ballantyne
Aline Rachel Bezerra Gurgel
Emma Boulton
Catriona Brown
Anubhav Bussooa
Alan Charles Cameron
Annabel Campbell
Ross Campbell
Jane Cannon
Nur Aishah Che Roos
Ashley Cochrane
David Corcoran
Roberta Cretella
Gemma Elizabeth Currie
Ana Da Silva Costa
Michael Deason
Lin Deng
Nina Denver
Laura Downie
Maria Dulak-Lis
Fariha Elwafi A Elsakloul
Lopez Gordo Estrella
Caroline Fattah
Marco Fernandez
Mark Findlay
Lauren Kaye Fleming
Khloud Ghafouri
Keith Gillis
Teja Gregorc
Sinead Griffin
Crawford Halliday
Craig (BHF 4yr PhD) (MRes)
Hamilton
Nabeha Saleh A Hawari
Weihong He
Helen Heathcote
Kirsty Hendry
Naomi Holman
Katie Yates Hood
Ahmad Dzulkarnain Ismail
Eleanor Jarvie
Valentine Jeantet
Omar Jassim Katwan
Daniele Michele Isabel Kerr
Quentin Lachaud
Christopher Lavery
Rosalind Lees
Emma Louise (BHF Scholar Programme) Low
Michael Lynch
Alison MacKenzie
Kenneth Mangion
Hannah Martin
Wardati Mazlan Kepli
Lisa McArthur
Linsay McCallum
Eilidh Wallace McGinnigle
Karen McGlynn
James McLaren
Hannah Louise Morgan
Kirsten Munro
Gerard Murphy
Katrin Nather

Ana Perez
Scott Robinson
Christopher James Rush
Li Shen
Joanne Simpson
Heather Small
Claire Speirs
Valters Stelmans
Hannah Stepto
Anastasia Strembitska
Wan Noraini Wan Sulaiman
Pantazis Takas
Josie Charlotte Van Kralingen
Emma Wallace
Nicola Walsh (Devine)
Anna Dorothy White
Ellanor Whiteley
Lauren Willis
Zichu (Paul) Yang
Apostolos Zarros

6.7 MD STUDENTS

Azmil Abdul-Rahim
Athar Ali Badar
Lauren Brash
Melanie Jade Brewis
Stephen Crawley
Richard Dobson
Patricia Fearon
Barry William Hennigan
Jamie Layland
Neil McGlinchey
David Mitchell
Elaine Robertson
Stephen David Thomson
Chih Wong