INTERNATIONAL SYMPOSIUM

# *Recent Advances in* Heart Failure

**KING'S COLLEGE LONDON BRITISH HEART FOUNDATION CENTRE OF RESEARCH EXCELLENCE**

**and**

**THE JOURNAL OF CLINICAL INVESTIGATION**

**15-16 SEPTEMBER, 2014**

**Royal College of Physicians**

**London, United Kingdom**

KING'S College LONDON

JCI The Journal of Clinical Investigation

British Heart Foundation

# *Programme*

## Monday, 15 September

**12.00 – 13.00** **Registration** - Reception
**Lunch** - Osler Long Room

**13.15 – 13.30** **Welcome and introduction** - Wolfson Auditorium
Ajay Shah (KCL) & Howard Rockman (USA)

**Session 1** **Cell signalling** - Wolfson Auditorium
**Chairs:** Metin Avkiran (KCL) & Catherine Shanahan (KCL)

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| **13.30 – 14.00** | Saptarsi Haldar (USA) | BET bromodomain proteins in heart failure |
| **14.00 – 14.30** | Mathias Gautel (KCL) | Titin as a signalling scaffold: disruptions in hereditary cardiomyopathies |
| **14.30 – 15.00** | Kristina Lorenz (Germany) | Targeting ERK activation in pathological hypertrophy |

**15.00 – 15.30** **Tea / coffee** - Osler Long Room

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| **15.30 – 16.00** | Christoph Maack (Germany) | HDAC4 and histone methylation during increased cardiac load |
| **16.00 – 16.30** | Mark Anderson (USA) | CamK oxidation and cardiac pathology |

**16.45 – 18.30** **Poster presentations (with refreshments)** - Osler Long Room

## Tuesday 16 September

**08.30 – 09.00** **Tea / coffee** - Osler Long Room

**Keynote Lecture** - Wolfson Auditorium
**Chair:** Ajay Shah (KCL)

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| **09.00 – 09.40** | Eric Olson (USA) | The molecules and mechanisms of heart development, disease and regeneration |

**Session 2** **Mitochondria and metabolism** - Wolfson Auditorium
**Chairs:** Philip Eaton (KCL) & Kinya Otsu (KCL)

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| **09.45 – 10.15** | Paolo Bernardi (Italy) | What is the mitochondrial PTP? |
| **10.15 – 10.45** | Tullio Pozzan (Italy) | Mitochondrial Ca/cAMP crosstalk and ATP generation |

**10.45 – 11.15** **Tea / coffee** - Osler Long Room

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| **11.15 – 11.45** | Robert Balaban (USA) | The role of the creatine kinase system in heart failure |
| **11.45 – 12.15** | Rui-Ping Xiao (China) | Ubiquitin ligase-mediated disruption of insulin signalling in metabolic syndrome |
| **12.15 – 12.45** | Leon de Windt (Netherlands) | Hypoxia-inducible miRNAs and regulation of fatty acid oxidation |

**12.45 – 14.00** **Lunch and poster viewing** - Osler Long Room

**13.30 – 14.00** **Early Career Researcher seminar** - Wolfson Auditorium

Sarah Jackson (JCI) Scientific publishing and a career as a science editor

**Session 3** **Diagnosis and therapeutics** - Wolfson Auditorium

**Chairs:** Michael Marber (KCL) & Phil Chowienczyk (KCL)

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| **14.10 – 14.40** | Manuel Mayr (KCL) | Post-genomics technologies for biomarker discovery |
| **14.40 – 15.10** | Stuart Cook (Singapore) | Genomics/phenotype correlation in human cardiomyopathy |
| **15.10 – 15.40** | Nic Smith (New Zealand) | Computational models of human heart failure: status and progress |

**15.40 – 16.10** **Tea / coffee** break - Osler Long

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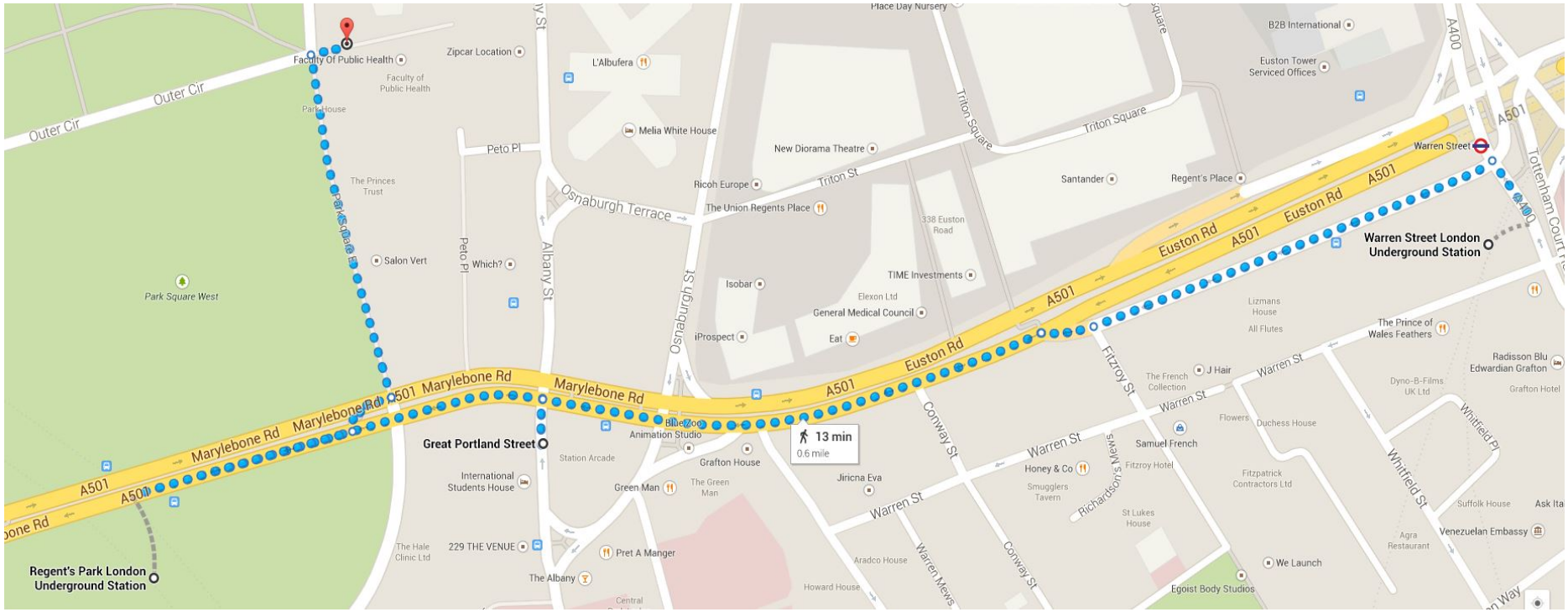
| **16.10 – 16.40** | Christine Seidman (USA) | RNAi (gene) therapy for hereditary cardiomyopathy |
| **16.40 – 17.10** | Roger Hajjar (USA) | Approaches to enhance SERCA function in vivo |

**17.10** **Poster award presentation and concluding remarks** - Wolfson Auditorium

Ajay Shah (KCL) & Howard Rockman (USA)

# *Venue*

The symposium will be held at the **Royal College of Physicians** (RCP), 11 St Andrews Place, NW1 4LE. The Royal College of Physicians is located next to Regent's Park in the centre of London and is easily accessible by all forms of transport: it is a 5 minute walk from Regent's Park and Great Portland Street underground stations and a 10 minute walk from Warren Street underground station.



## *Hosted by*

## **Ajay Shah,** *King's BHF Centre of Research Excellence*

Professor Ajay Shah graduated from the University of Wales College of Medicine in 1982. His postgraduate doctoral training was undertaken with Dirk Brutsaert in Belgium and Andrew Henderson in Cardiff, his thesis being awarded with Distinction in 1990. Subsequent academic training included a British Heart Foundation Intermediate Fellowship, a period at the National Institutes of Health in the USA, and a Medical Research Council Senior Clinical Fellowship. He was appointed to the Chair of Cardiology at King's College London in 1998. The title of James Black Professor of Medicine was conferred on him in 2014.

He is an elected Fellow of the Academy of Medical Sciences, the European Society of Cardiology, the American Heart Association, and the International Academy of Cardiovascular Sciences, and a member of the Association of Physicians of Great Britain and Ireland. He is the current Chairman of the European Society of Cardiology Working Group on Myocardial Function and the Chairman of the Basic Science section of the Heart Failure Association of the European Society of Cardiology (2006- ). He is on the editorial board of Heart, European Heart Journal, Cardiovascular Research, Journal of Molecular & Cellular Cardiology, European Journal of Heart Failure, Basic Research in Cardiology, Heart Lung & Circulation, and Heart & Vessels. He has also led the establishment of the annual Winter Congress on Translational Basic Science of the Heart Failure Association of the ESC.

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## **Howard Rockman,** *Journal of Clinical Investigation*

Dr Howard A. Rockman is the Edward S. Orgain Professor of Medicine and has joint appointments in the Departments of Cell Biology and Molecular Genetics and Microbiology. Dr Rockman received his MD from McGill University in 1983. He completed medical residency at the Montreal General Hospital in 1987 and in 1991, Cardiology Fellowship at the University of California, San Diego. His research interests focus on understanding the molecular mechanisms of cardiac hypertrophy and heart failure. His recent work in understanding the role of GPCR signaling in the pathogenesis of the failing heart may potentially lead to the development of novel drugs for the treatment of heart failure. He has authored over 190 journal articles, and has been elected to the Association of American Physicians and the American Society for Clinical Investigation. He has mentored over 55 scientists in his laboratory, two of which have been the recipient of the prestigious Louis N. and Arnold M. Katz Basic Science Research Prize from the AHA. He received the AHA Distinguished Achievement Award in 2011 and is currently the Editor-in-Chief of The Journal of Clinical Investigation.

# *Speaker profiles*

## Saptarsi Haldar

Saptarsi M. Haldar, M.D. is an Assistant Professor of Medicine at Case Western Reserve University (CWRU) School of Medicine, Cleveland, Ohio. He received his B.S. from Cornell University and his M.D. from Johns Hopkins University School of Medicine. He trained in Internal Medicine at Johns Hopkins followed by Fellowship in Cardiovascular Disease at Brigham and Women's Hospital, Harvard Medical School. He is a principal investigator at the Case Cardiovascular Research Institute, CWRU School of Medicine and Harrington Heart & Vascular Institute, University Hospitals Case Medical Center (UHCMC).

The focus of Dr Haldar's research is to understand gene-regulation in the cardiovascular system, skeletal muscle, and metabolic tissues with an ultimate goal of finding novel therapeutic strategies to prevent and treat heart failure, cardiometabolic conditions and myopathic diseases. Study of these transcriptional and epigenetic signaling pathways range from *in vitro* to *in vivo* approaches, utilize mouse genetic manipulation, and leverage genome-wide analyses and chemical biology. Important observations from his group include identification of BET family acetyl-lysine "reader" proteins as key effectors chromatin dependent signal transduction in the heart and demonstration that the zinc finger transcription factor KLF15 is a critical regulator of cardiovascular plasticity and multi-organ metabolic homeostasis. This work has led to novel pathophysiologic and therapeutic insights for diseases such as heart failure, vasculopathies, diabetes, and skeletal myopathies.

Dr Haldar is the recipient of numerous awards including the Jeremiah Stamler Distinguished Young Investigator Award and an Individual Biomedical Research Award from The Hartwell Foundation. He is an NIH-funded investigator and has published papers in *Cell, Science Translational Medicine, Nature*, *PNAS, Cell Metabolism*, and the *Journal of Clinical Investigation*. He is dedicated to the mentorship of medical, graduate, and postgraduate trainees at CWRU and University Hospitals Case Medical Center. Dr Haldar is a Cardiologist at UHCMC and cares for patients in the cardiac intensive care unit.

# Mathias Gautel

Professor Gautel received his MD from Heidelberg University in 1991, and was then a post-doctoral fellow and visiting team leader (1996-1998) at EMBL Heidelberg, where he worked on his habilitation (MD PhD equivalent) in Biochemistry on titin-based sarcomere assembly at Heidelberg University in 1998. After nine years at EMBL, Professor Gautel was awarded a Heisenberg Fellowship by the German Research Foundation, and joined the Max-Planck-Institute of Molecular Physiology, Dortmund, as a group leader. He was appointed as Professor of Molecular Cardiology at King's College London in 2002, and was awarded the British Heart Foundation Chair of Molecular Cardiology at King's in 2008. He heads the Randall Muscle Signalling and Development Section, and the KCL BHF Centre of Research Excellence Muscle Cell Biology theme. He is European Coordinator of the Fondation Leducq Translatlantic Network of Excellence "Proteotoxicity: an unappreciated mechanism of heart disease and its potential for novel therapeutics".

Professor Gautel was awarded the International Society for Heart Research (ISHR) Outstanding Investigator Award in 2009. He was elected as a Fellow of the Academy of Medical Sciences (FMedSci) in 2010.

The laboratory uses molecular genetic, cell biophysical and biophysical, biochemical, structural, and physiological methods to study the biological principles that underpin sarcomere assembly, signaling, and controlled proteolytic turnover. Current areas of interest include mechanosignalling by muscle cytoskeletal proteins, their cross-talk with the proteolytic systems of muscle and gene expression regulation, and the perturbation of these processes in acquired and inherited muscle diseases.

# Kristina Lorenz

Kristina Lorenz, born 1972 in Kassel, studies Pharmacy at Würzburg University. After being licenced as a pharmacist, she started her doctoral thesis with Professor Martin Lohse at the Institute for Pharmacology in 1999. She earned her PhD in 2004, before working as a research fellow at the Institute for Pharmacology and Toxicology.

After a research period at the University in Rochester (USA), Lorenz returned to Würzburg University in 2009. Here she headed research projects at the Collaborative Research Center (Sonderforschungsbereich, SFB) 688, at the Comprehensive Heart Failure Center and at the Rudolf Virchow Center for Experimental Biomedicine.

In 2012, Lorenz joined the Technische Universität Dresden, where she was a research fellow at the Institute for Pharmacology and Toxicology and deputy of head of institute Ursula Ravens. In January 2013, she accepted the offer of a Professorship of Molecular Pharmacology back at Würzburg University.

# Christoph Maack

Christoph Maack received his MD at the University of Cologne (Germany) in 2000. After 2 years of clinical work at the Department of Cardiology at the University of the Saarland in Homburg, he joined Brian O'Rourke at Johns Hopkins University in Baltimore (USA) as a post-doctoral research fellow from 2002-2005. In 2005 he returned to the Department of Cardiology in Homburg, where he established his own working group supported by the Emmy Noether Programme (2006-2011) of the German Research Foundation (DFG). Since 2012 he is a Senior physician in the Department of Cardiology, and in the same year was awarded a Heisenberg Professorship for Cardiovascular Physiology and Bioenergetics.

His work focuses on cellular defects in chronic heart failure, with special emphasis on the regulation of mitochondrial reactive oxygen species formation as well as epigenetic regulatory mechanisms in heart failure. For his research, Dr Maack received the Franz-Maximilian-Groedel- and Albert-Fraenkel-Research Awards of the German Cardiac Society in 2007 and 2014, respectively. As a Board member of the Heart Failure Association (HFA) of the European Society of Cardiology (ESC) since 2010, Dr Maack coordinated the Translational Research Committee from 2011-2014 and became the Chair of the Basic Science Section of the HFA in 2014.

# Mark Anderson

Dr Mark Anderson assumed the position of the William Osler Professor of Medicine Chair, Director for the Department of Medicine in the Johns Hopkins University School of Medicine in August 2014. Once medical licensure is transferred to the state of Maryland he will become the Physician-in-Chief of The Johns Hopkins Hospital.

Prior to joining Johns Hopkins University, Dr Anderson was the Francois M. Abboud Chair of Internal Medicine and the Chairman and Department Executive Officer for the Department of Internal Medicine at the University of Iowa from 2009 - 2014. He served as Director of Cardiovascular Medicine prior to taking the role of Chair. During his tenure at Iowa, he served as Director of the Francois M. Abboud Cardiovascular Research Center which seeks to develop multi-disciplinary cardiovascular research to attract industry, business and government partners as the typical channels for funding biomedical research decline. Before Iowa, Dr. Anderson was at Vanderbilt University where he served in multiple capacities including Director of the Electrophysiology and Cardiovascular Research Fellowship Programs and Arrhythmia Service as well as serving as a member of the Vanderbilt Physician Scientist Development Program selection committee.

Dr Anderson's research is focused on cellular signaling and ionic mechanisms that cause heart failure and sudden cardiac death. He is widely recognized as an international expert in defining the role of calmodulin kinase II (CaMKII) regulation in heart failure and arrhythmias. The laboratory is funded by the National Institutes of Health, the American Heart Association, the American Asthma Foundation and the Fondation Leducq. Dr Anderson has published nearly 200 peer reviewed publications and is frequently an invited speaker nationally and internationally to present his research. He is a cofounder of Allosteros Therapeutics, a biotech aiming to develop CaMKII inhibitor drugs.

# Eric Olson

Dr Olson grew up in North Carolina and attended Wake Forest University, receiving a B.A. in Chemistry and Biology, a Ph.D. in Biochemistry, and an honorary doctorate. After postdoctoral training at Washington University School of Medicine, he began his scientific career at MD Anderson Cancer Center in Houston. In 1995, he founded the Department of Molecular Biology at The University of Texas Southwestern Medical Center in Dallas.

Eric Olson has dedicated his career to deciphering the mechanisms that control development and disease of the heart, cardiovascular system and skeletal muscle tissue. He and his colleagues discovered many of the key transcription factors and mechanisms responsible for cardiac gene regulation and formation of the heart and, in so doing, unveiled the molecular underpinnings of congenital and acquired diseases of the heart. Most recently, Olson has focused on epigenetic mechanisms and microRNAs as regulators of muscle development and disease.

Olson is among the most highly cited researchers, with his publications cited over 70,000 times in the literature. He has trained numerous students and postdoctoral fellows, many of whom are emerging as the next generation of leaders in cardiovascular biology.

Dr Olson co-founded multiple biotechnology companies to translate basic discoveries into new therapeutics for muscle disease. He was co-founder of Myogen, Inc., a biotechnology company focusing on therapies for heart muscle disease. In 2007, he co-founded miRagen Therapeutics, which is developing new therapeutics for cardiovascular disease, based on microRNAs. In 2010, he and his colleagues founded Lone Star Heart, which is working to develop new approaches for heart regeneration and repair.

# Paolo Bernardi

Paolo Bernardi began his studies on mitochondrial physiology and ion transport under the guidance of Giovanni Felice Azzone, one of the founding Fathers of Bioenergetics. His education in Cellular and Molecular Biology was completed with a long-term stay at the Whitehead Institute for Biomedical Research - Massachusetts Institute of Technology, where he worked under the supervision of Harvey F. Lodish. He pioneered the field of mitochondrial channels and their role in cellular pathophysiology. In particular, he focused on the permeability transition pore (PTP), a high conductance channel that is increasingly recognized as a key player in cell death. During the early 1990s he defined key points of regulation of the PTP in isolated mitochondria (membrane potential, matrix pH, Me2+-binding sites, specific redox-sensitive sites). He then developed tools to reliably monitor mitochondrial function in situ, and addressed mechanistic questions on the PTP as a target in degenerative diseases and cancer. His studies have been extended to in vivo models, and led to the demonstration that early mitochondrial adaptation plays a key role in hepatocarcinogenesis [Klöhn et al. (2003) Proc Natl Acad Sci USA 100, 10014-10019] and in onset of the Warburg effect [Sciacovelli et al. (2013) Cell Metab 17, 988-999]; and that mitochondrial dysfunction unexpectedly causes muscular dystrophy in collagen VI deficiency [Irwin et al (2003) Nat Genet 35, 367-371; Angelin et al. (2007) Proc Natl Acad Sci USA 104, 991-996; Merlini et al. (2008) Proc Natl Acad Sci USA 105, 5225-5229]. His recent identification of the PTP, which forms from dimers of the FOF1 ATP synthase under conditions of oxidative stress [Giorgio et al. (2013) Proc Natl Acad Sci USA 110, 5887-5892; Carraro et al. (2014) J Biol Chem, in press] offers great promise for the molecular definition of pore function in health and disease.

Paolo Bernardi was a major actor in the Mitochondrial Renaissance of the 1990s. As early as 1992 he was one of the few to realise the importance of mitochondria in cell death well before the role of cytochrome c release was shown to be a key event in apoptosis. He pioneered the field rapidly reaching international recognition, as testified by 172 invited lectures at meetings and 118 seminars at prestigious Institutions worldwide. He has organized or coorganized key meetings on mitochondrial pathophysiology that significantly contributed to the continuing success of the field. Prof. Bernardi is the Author of 202 peer-reviewed articles that as of May, 2014 have received 19,781 citations with an h index of 70.

# Tullio Pozzan

Tullio Pozzan, graduated in Medicine at the University of Padua in 1973 and he was nominated Full Professor of General Pathology at the University of Ferrara in 1986. In 1990, Dr Pozzan was elected Chairman of the Department of Biomedical Sciences at the University of Padova and he held this position until 2002. In 2009 he was nominated Director of the Institue of Neuroscience of the National Research Council of Italy and from 2012 Director of the Department of Biomedical Sciences of the same Institution.

Dr Pozzan's pioneering research set the groundwork for our understanding of how cells regulate Ca2+ concentrations within cellular compartments. His research demonstrated that changes in Ca2+ concentrations impact cell signalling in both health and disease. He has developed new approaches that allowed to directly monitor the concentration of Ca2+ and cAMP in various locations within living cells. Dr Pozzan is a member of many prestigious Academies, among which the National Academy of Sciences of the USA, the Royal Society of Canada, EMBO and the Accademia dei Lincei (Italy). Bibliometric data on Articles and reviews: total number of citations: 37,092, h-index: 101.

# Robert Balaban

Robert Balaban received his BS in biology and chemistry from the University of Miami in 1971 and his PhD in physiology and pharmacology from Duke University in 1980. He was awarded a NATO fellowship to the Department of Biochemistry at the University of Oxford in 1981. In 1982, Dr Balaban joined the NIH as a staff fellow in the NHLBI Laboratory of Kidney and Electrolyte Metabolism. He was named Chief of the newly formed Laboratory of Cardiac Energetics in 1988. Dr Balaban served as trustee and president of the Society for Magnetic Resonance in Medicine from 1994 to 1995, of the International Society for Magnetic Resonance in Medicine from 1995 to 1996, and of the Society for Cardiovascular Magnetic Resonance from 1999 to 2001. He is a member of the American Physiological Society, the International Society for Magnetic Resonance in Medicine, the Society for Cardiovascular Magnetic Resonance, the American Society for Cell Biology, and the Biophysical Society.

Dr Balaban bases his research on the hypothesis that mitochondria are modulated to support cellular metabolic homeostasis chronically by altering mitochondrial content, composition, and cellular location. Given the complexity of the mitochondrial proteome, it is clear that the focus must be on regulatory networks and manipulations of functional pathways, not on a few lone proteins. Accordingly, his laboratory takes a systems approach to studying mitochondrial protein composition and distribution in relation to function. He and his colleagues study post-translational modifications of mitochondrial proteins to understand how proteins and enzymes rapidly adjust to maintain metabolic homeostasis under acute changes in energy demand.

Complementing biochemical, proteomics-based, and computational approaches, Dr Balaban's laboratory studies the changes in mitochondria that occur in vivo. Moving from an earlier interest in nuclear magnetic resonance (NMR) to study physiological changes associated with energetics, Dr Balaban and his colleagues have developed non-linear optical microscopy techniques for observing the subcellular dynamics, topology, and orchestration of mitochondria in muscle relative to exercise. The unique aspect of this approach is the ability to deliver light deep inside tissues using infrared light. It is also the most efficient method of imaging fluorophores since all of the emitting light can be used to create a fluorescent image.

As a serendipitous offshoot of their efforts in non-linear microscopy, Dr Balaban and his colleagues discovered that they could visualize the composition of blood vessel walls without the need for dyes. They are using this method to study the early stages of atherosclerosis. Based on the evidence they have obtained, Dr Balaban is testing the hypothesis that atherosclerotic lesion formation is dependent upon the extracellular matrix composition of the vascular wall.

# Rui-Ping Xiao

Dr Rui-Ping Xiao was trained as a physician-scientist in both China and the United States. Briefly, from 1979 to 1987, she received her M.D. and medical training at Tong-Ji Medical University, China. To pursue further scientific training, she went to the United States, and spent 20 years in National Institute on Aging (NIA), NIH, from a postdoctoral fellow (1990-1992), to a Staff Scientist (1992-1995), a tenure-track Investigator (1996-2003), and a tenured Senior Investigator and the Chief of the Receptor Signaling Section (2003-010). Overlapping with her training at NIH, she also completed her Ph.D. study in the Medical School of University of Maryland from 1991 to 1995. Additionally, in 2005, she was invited by Peking University to serve as the Founding Director of the Institute of Molecular of Medicine (IMM) at Peking University (initially as a volunteer), and became a full-time returnee through the Chinese 1000-elite Program in 2010.

Over the past decade, Dr Xiao has been serving as the full time Director of the IMM-PKU. As the first autonomous research institute, the IMM-PKU was founded in January 2005, and was designed as an interdisciplinary research center reflecting of PKU's focus on excellence in biomedical research and education. Dr Xiao's research has been focused on cardiovascular and metabolic diseases, with a major emphasis on a translational approach to take bench discoveries into clinically relevant situations. Ongoing research directions include signaling pathways involved in metabolic syndrome and associated cardiovascular complications. In addition, considerable efforts have been devoted to understanding mechanisms underlying cardiac aging and heart failure and developing novel therapies for the treatment of heart failure.

# Leon de Windt

Leon de Windt received a Master's degree in Molecular Biology from Utrecht University in 1994 and a PhD in Cardiovascular Physiology from Maastricht University in 1999. He carried out his postdoctoral studies in the laboratory of the Howard Hughes Medical Institute Investigator Jeffery D. Molkentin at Children's Hospital Medical Center in Cincinnati OH, USA as an American Heart Association Fellow. In 2002 he was appointed group leader at the Hubrecht Institute. In 2008 he was appointed Associate Professor at the University Medical Center Utrecht, the Netherlands and the Royal Netherlands Academy of Sciences. In 2010 he moved to Maastricht where he was appointed as Professor of Molecular Cardiology at the Department of Cardiology, CARIM School for Cardiovascular Diseases, Maastricht University.

Leon de Windt is the recipient of several awards, including the European Young Investigators Award in Cardiology from the Bekales Foundation; co-recipient of the Louis N. and Arnold M. Katz Basic Science Research Award for Young Investigators from the American Heart Association; recipient of a 2003 Innovational Research Incentives Scheme VENI award and an Innovational Research Incentives Scheme 2007 VIDI award from the Netherlands Organization of Scientific Research (NWO); in 2008 he was selected as core member of a Fondation Leducq Transatlantic Network of Excellence; he is the recipient of the 2012 Outstanding Achievement Award of the ESC Council for Basic Cardiovascular Science as well as the 2012 Galenus Research Prize. In 2012, he received an ERC Starting Grant from the prestigious European Research Council to support his work.

# Manuel Mayr

Prof Manuel Mayr received his first degree in medicine from the University of Innsbruck, Austria, where he graduated “sub ausspiciis presidentis rei publicae”, the highest distinction awarded for academic education. From 1996-1998 he worked with Prof. Georg Wick at the Institute of Experimental Pathology, Innsbruck, Austria on the role of heat shock proteins in atherosclerosis. Beginning his postdoctoral studies, he joined Prof. Qingbo Xu’s group at the Institute of Biomedical Aging Research of the Austrian Academy of Sciences, working in the area of animal models and cellular signalling in response to biomechanical stress. In 2001, he moved together with Prof. Xu to London. At St. George’s, he developed his proteomic skills and obtained his PhD, entitled “Cardiovascular proteomics: Linking proteomic and metabolomic changes” from the University of London in 2005. In 2006, he spent a sabbatical in Prof. Peipei Ping’s laboratory at the University of California, Los Angeles, to further advance his skills in mass spectrometry. He is now in charge of the new proteomics facility at the James Black Centre that will provide a technology platform for cardiovascular research (www.vascular-proteomics.com).

Prof Mayr is a member of the Editorial Board for Proteomics - Clinical Applications and was recently appointed as Associate Editor for the Journal of Molecular and Cellular Cardiology. He is serving on the American Heart Association Program Committee (Council on Functional Genomics & Translational Biology) and the Management Committees of the British Atherosclerosis Society (BAS), the British Society for Proteome Research (BSPR) and the London Vascular Biology Forum (LVBF).

# Stuart Cook

Dr Cook grew up in Kenya, completed his schooling at St Edward's School, Oxford and studied medicine at St Bartholomew's hospital, London. He completed junior medical jobs in London, obtained his MRCP and then did a PhD at the National Heart and Lung Institute, Imperial College, London. He undertook a three-year Post Doctoral training post at Harvard funded by a Wellcome Trust International Prize Travelling Fellowship. He returned to the UK to complete his training in clinical cardiology and was awarded a Department of Health Clinical Scientist Award in 2004. In 2008 he was appointed to Senior Lecturer at Imperial College, Group Head in Molecular Cardiology at the MRC Clinical Sciences Centre and Honorary Consultant at the Hammersmith Hospital. In 2009 he was appointed as Head of Genetics at the Cardiovascular Biomedical Research Unit at the Royal Brompton NHS Trust and was made Professor of Clinical and Molecular Cardiology at Imperial College in 2010. In 2012 he was awarded a Singapore Translational Research Investigator (STaR) Award and appointed as Professor at Duke-National University of Singapore and senior consultant at the National Heart Centre Singapore. In 2013 he became deputy Director of the Cardiovascular and metabolic disorders Signature Research Program at Duke-NUS and in 2014 was appointed as founding Director of the National Heart Research Institute Singapore. He heads a cross-disciplinary research team, anchored in genetic discovery in humans and model systems, with the overarching goal of identifying new genes and pathways for heart disease.

# Nic Smith

Prior to joining the Faculty of Engineering in August 2013, Nic Smith was Head of Biomedical Engineering at King's College London and visiting Professor of Computational Physiology at the University Computing Laboratory, University of Oxford.

His research is characterised by the development of integrated multi-scale and multi-physics models, which provide the ability to link biophysically detailed experimental data to integrated function from sub-cellular to the whole organ level. Within the scope of this work, he has developed computational techniques to enable specific model developments that have in turn been applied to provide insight into both basic physiology and clinical contexts. This research is focused on electrophysiology and contraction at the cellular level and the multi-scale translation of these models to simulate blood flow and cardiac electro-mechanics at the tissue level.

Professor Smith led the computational modelling group at KCL which is currently a central contributor to the Virtual Physiological Human (VPH) Project. He has authored over 120 peer journal reviewed publications, 300 conference publications and is on the editorial board for the international peer review journals including the Journal of Physiology, Microcirculation, Medical & Biological Engineering & Computing and International journal of Computational Methods in Bioengineering. He is the lead-author on several patent applications filed with the United States and European Patent Offices, which outline intellectual property covering the development of anatomically based physiological models and specific applications.

# Christine Seidman

Christine Seidman, MD is the Thomas W. Smith Professor of Medicine and Genetics at Harvard Medical School and Brigham and Women's Hospital and an Investigator of the Howard Hughes Medical Institute. She was an undergraduate at Harvard College and received a M.D. from George Washington University School of Medicine. After clinical training in Internal Medicine at John Hopkins Hospital she received subspecialty training in cardiology at the Massachusetts General Hospital. Dr Seidman is a faculty member of Brigham and Women's Hospital, where she serves as Director of the Brigham Research Institute. She is the founding Director of the BWH Cardiovascular Genetics Center.

Dr Seidman's laboratory uses genomic strategies to define causes of human cardiovascular disease, including congenital heart malformations and cardiomyopathies. By exploiting model systems to identify pathways impacted by mutations, these studies have enabled gene-based diagnostics and novel strategies to limit the deleterious consequences of human mutations. Dr Seidman also leads multi-institution consortium that assess rare and common variants involved in cardiovascular phenotypes and that explore the clinical utility of genomic variation in early diagnosis and prevention of cardiovascular disease.

The recipient of many honors, Dr Seidman is a Distinguished Scientist of the American Heart Association, Fellow of the American Academy of Arts and Sciences, and member of the Institutes of Medicine and the National Academy of Sciences.

# Roger Hajjar

Dr Roger Hajjar is the Director of the Cardiovascular Research Center at Mount Sinai, in addition to being an Arthur & Janet C. Ross Professor of Medicine, Professor of Gene & Cell Medicine, Director of the Cardiology Fellowship Program, and Co-Director of the Transatlantic Cardiovascular Research Center, which combines Mount Sinai Cardiology Laboratories with those of the Universite de Paris – Madame Curie.

Prior to joining Mount Sinai in 2007, Dr Hajjar served as Director of the Cardiovascular Laboratory of Integrative Physiology and Imaging at Massachusetts General Hospital and Associate Professor of Medicine at Harvard Medical School. Dr Hajjar has also been a staff cardiologist in the Heart Failure & Cardiac Transplantation Center at Massachusetts General Hospital. After earning a bachelor's of science degree in Biomedical Engineering from Johns Hopkins University and a medical degree from Harvard Medical School and the Harvard-MIT Division of Health Sciences and Technology, he completed his training in internal medicine, cardiology and research fellowships at Massachusetts General Hospital in Boston.

Under Dr Hajjar's leadership, the Cardiovascular Research Center has already developed the world's first potential gene therapy for heart failure.

# *Posters*

**P01**
*Glycoproteomics reveals decorin fragments with anti-myostatin activity in human atrial fibrillation*
**J Barallobre-Barreiro** (King's College London, UK), SK Gupta, X Yin, SR Langley, M Bern, A Kourliouros, M Jahangiri, R Viner, A Kichler, T Thum, J Heineke, M Mayr

**P02**
*Local cyclic nucleotide dynamics and kinase activity in the PLM/NKA compartment of adult rat ventricular myocytes*
**Z Bastug** (University of Göttingen, Germany), D Pavlovic, M Shattock, VO Nikolaev

**P03**
*Plasma MicroRNA Levels in Patients with Acute Coronary Syndrome are Associated with Platelet Function*
M Mayr, D Kaudewitz, P Skroblin, P Willeit, A Morton, F Gracio, K Dudek, **L Bender** (King's College London, UK), S Langley, S Kiechl, T Warner, E De Rinaldis, A Zampetaki, A Saxena, R Storey

**P04**
*Chemotherapy agent doxorubicin causes acute concentration-dependent mitochondrial dysfunction in Langendorff-perfused rat hearts*
**JM Elder** (Imperial College, London, UK), JD Simonotto, EW Tate, SE Harding, AR Lyon

**P05**
*Modelling the effect of phosphorylation on the dynamics of the cardiac myosin regulatory light chain*
**A Fornili** (King's College London, UK), E Rostkova, F Fraternali, M Pfuhl

**P06**
*Glucagon-like peptide-1 protects against adverse post-myocardial infarction remodeling via specific actions on inflammation and the extracellular matrix*
E Robinson, M Tate, BJ McDermott, BD Green, **DJ Grieve** (Queen's University Belfast, UK)

**P07**
*Disruption of oxidative PKA activation contributes to ventricular remodeling upon increased afterload*
**T Islam** (University of Göttingen, Germany), C Dantz, H Daniel, H Moellencamp, A El-Armouche, P Eaton, LS Maier, S Wagner

**P08**
*Autophagy is important for the maintenance of the quantity and size of mitochondria in the heart: Analysis of TSC2-deficient hearts*
**M Taneike** (King's College London, UK), K Nishida, K Otsu

**P09**
*Subcellular redistribution of PDEs compensates for increased functional demand in early HF*
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**T Riebeling** (University of Göttingen, Germany), J Staab, T Meyer

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