

The President's Lecture

In October 2004, the International Council created a new distinguished lecture, named The President's Lecture, which is a highlight of ISHR World Congresses and Section meetings.

The President's Lecture is held at each World Congress of the ISHR and, in non-Congress years, at the annual meeting of one of the 3 largest ISHR Sections on a rotating basis. This lecture is intended to be a high profile event and is scheduled as a keynote plenary lecture. The International Council selects the speaker. **The topic of the lecture is in the field of molecular biology, genetics, genomics or proteomics, but the content should be chosen to be of broad interest to the cardiovascular community.** The speaker is reimbursed for travel expenses, and receives a plaque and a \$1,000 honorarium. A photograph and biosketch of the speaker is published in *Heart News and Views*, and is posted in the ISHR website.

The President's Lecture enhances the content of the ISHR scientific meetings by providing a high-quality presentation in a topical area that is not covered by other distinguished lecture awards, and reflects the continuing growth of the ISHR as a professional Society. This award is funded by a generous donation from **Roberto Bolli, MD**, Winner of the ISHR 2004 Research Achievement Award, who declined to collect the monetary prize associated with the Award and requested that it be used for this purpose.



ISHR

International Society for Heart Research

President

M Avkiran, *UK*

President Elect

E Murphy, *USA*

Past President

M Hori, *Japan*

Secretary General

R Moss, *USA*

Treasurer

A Gustafsson, *USA*

Journal Editor

D Eisner, *UK*

Bulletin Editors

L Anderson Lobaugh, *USA*

T Ruigrok, *The Netherlands*

Council 2013-2016

H Ardehali, *USA*

L Delbridge, *Australia*

F del Monte, *USA*

F di Lisa, *Italy*

P Ferdinandy, *Hungary*

R Fischmeister, *France*

K Fukuda, *Japan*

L Hool, *Australia*

I Komuro, *Japan*

D Lefer, *USA*

G Lopaschuk, *USA*

T Murohara, *Japan*

P Ping, *USA*

Y Saito, *Japan*

R Schulz, *Germany*

M Sussman, *USA*

KK Talwar, *India*

T Thum, *Germany*

M Vila-Petroff, *Argentina*

R-P Xiao, *China*

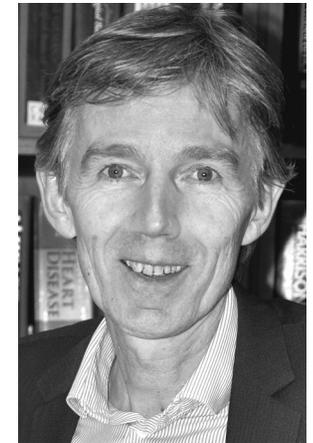
Y Zhu, *China*



ISHR

International Society for Heart Research

The President's Lecture 2016



Honored Speaker

**Thomas
Eschenhagen, M.D.**

**“Modelling heart disease in
the dish—chances and
challenges”**

2016 Honored Speaker

Thomas Eschenhagen, M.D. Buenos Aires, Argentina

Dr. Thomas Eschenhagen is Professor of Pharmacology and serves as Director of the Department of Experimental Pharmacology and Toxicology at the University Medical Center Hamburg Eppendorf (UKE), Germany. Dr. Eschenhagen studied Medicine (1978-1986) and received his M.D. (experimental thesis) in Pharmacology and Toxicology in 1988. After a three year residency in Internal Medicine he began his training as Pharmacologist at the UKE under the direction of Prof. Hasso Scholz in 1989. In 1994 he received a prestigious Heisenberg Stipend of the German Research Foundation (DFG) and spent several short-term fellowships (2-6 months) in Washington University School of Medicine, St. Louis, MO (Prof. Elliot L. Elson), Stanford Research Institute, Menlo Park, CA (Dr. Nanette Bishopric), National Institute on Aging, Baltimore, MD (Dr. Edward G. Lakatta), and INSERM Unit 544 in Chatenay-Malabry, Paris, France (Dr. Rodolphe Fischmeister). In 1998 he became Chair of the Institute of Clinical Pharmacology at the University of Erlangen, Germany and in 2002 he took his present position in Hamburg.

Dr. Eschenhagen has received numerous awards and honors including the Martini-Award, University of Hamburg (1991), the Rudolf Thauer Award, German Society of Cardiology (1992), Sandoz Award for Translational Science (1995), Fraenkel Award of the German Society of Cardiology (1997), the Ursula M. Händel Award for the Replacement of Animal Experiments of the DFG in 2011, and the Outstanding Investigator Award of the International Society for Heart Research (ISHR) in 2012. He was named Fellow of the American Heart Association in 2004, the European Society of Cardiology in 2010, and the ISHR in 2010. He served on the ISHR European Section Council (ISHR-ES) between 2005 and 2014 and was president of ISHR-ES 2010-2012. He is member of the Academy of Science, Göttingen (2004), and the German Academy of Science Leopoldina (2008). Since 2011 he is coordinator and speaker of the German Center of Cardiovas-

cular Research (DZHK), a long term, high volume grant initiative of the German Ministry of Research involving 7 partner sites and 30 institutions. He served 8 years as a panel member of the DFG for cardiovascular science and is member of the DFG Senate's Commission for Collaborative Research Centres since 2012. Besides memberships in several editorial boards, he served as Associate Editor of Cardiovascular Research from 2012 to 2015, and Circulation since 2016.

Dr. Eschenhagen has concentrated his research efforts on understanding molecular mechanisms of heart failure with a focus on β -adrenergic signaling, its adaptation in heart failure and consequences on contractile function. He contributed significantly to a better understanding of G protein-mediated signaling mechanisms in cardiac myocytes, in molecular adaptations underlying β -adrenergic desensitization in heart failure and their pathophysiological role. In a collaboration with R. Fischmeister's group in Paris, he contributed to deciphering the role of NO and cGMP for β -adrenergic signaling. He and his group were the first to describe increased phosphatase activity in heart failure and participated in unraveling the role of phosphatase inhibitor-1, a small conditional amplifier of β -adrenergic signaling. They were the first to find phosphatase inhibitor-1 downregulated in heart failure and showed that ablation of inhibitor-1 has protective effects against acute and chronic β -adrenergic stimulation. Transgenic experiments with conditional overexpression of inhibitor-1 mutants provided evidence against the usefulness of inhibitor-1 gene therapy in patients with heart failure. Overall, these data indicate that desensitization of the β -adrenergic signaling pathway is protective in heart failure and provides a paradigm for novel therapeutics in addition to beta-blockers.

A second focus of his group is pharmacogenetics of β -adrenergic receptors and beta-blockers. He and his group showed an important role of the hepatic CYP2D6 gene polymorphism for the frequency of effects to metoprolol and the clinical response rate. A pharmacogenetic substudy of a large prospective study in patients with heart failure showed that the common Arg389Gly polymorphism in the β 1-adrenoceptor gene determines the heart rate response to carvedilol, but not bisoprolol. Interestingly, this difference was confined to patients with atrial fibrillation.

Dr. Eschenhagen is perhaps best known for his pioneering work on 3-dimensional engineered heart tissue (EHT). In a landmark paper resulting from collaboration with Dr. Elson's group in St. Louis he described for the first time a

method to generate spontaneously beating, force-generating 3D heart tissue from embryonic chick hearts. The original lattice technique was quickly adapted to neonatal rat cardiac myocytes and modified to a ring-EHT format with better tissue development and easier handling. Originally designed as an improved in vitro model for drug testing and target validation, the EHT technology has now been expanded to an automated 24-well screening platform based on fibrin-based EHT cultured on elastic silicone posts. In combination with human embryonic stem cell- and human induced pluripotent stem cell (iPSC)-derived cardiac myocytes, this technique opens new perspectives in biomedicine, e.g. medium throughput drug screening, Long QT syndrome and cardiotoxicity testing, iPSC-mediated disease modeling and others. In 2014 he received a European Research Council (ERC) Advanced Grant for "Individualized risk prediction of cardiac diseases with iPSC-derived EHTs". In parallel, he and his group have developed the EHT technology towards cardiac repair applications and have shown that EHTs survive after implantation on rat hearts and improve cardiac function after myocardial infarction. Transplantation of human iPSC-derived EHTs on immune suppressed guinea pigs recently yielded very encouraging results, suggesting that this concept can be translated towards a first-in-man application.

Dr. Eschenhagen is an engaged teacher and mentor. He is author of several textbook chapters on cardiovascular pharmacology and has trained more than 65 M.D. thesis and 25 Ph.D. thesis students. Two fellows who trained in his lab received their own independent professorship (Drs. Wolfram H. Zimmermann and Ali El-Armouche) or leading positions in cardiology (Drs. Ulrich Laufs and Joachim Weil). By recruiting Drs. Lucie Carrier, Paris, in 2004, Friederike Cuello, London, in 2012 and Torsten Christ, Dresden, in 2013, he strengthened the team in Hamburg and extended its research focus and international networks. Dr. Carrier, who has now an independent full professorship at the Department, brought in a focus on functional genomics of hypertrophic cardiomyopathy and protein quality control and developed gene therapy for neonatal cardiomyopathy. Dr. Cuello is Associate Professor and brought with her a longstanding interest in the role of post-translational modifications for the function of the heart. Dr. Christ is group leader and an expert in cardiac electrophysiology. The complementary expertise and interest make the Department in Hamburg a good place for the training of young cardiovascular scientists.