

## ISHR Outstanding Investigator Award

The purpose of this annual award is to recognize an outstanding scientist who (i) is making major and independent contributions to the advancement of cardiovascular science, and (ii) is leading a growing research program likely to play a major role in the future. The main criteria for selecting awardees are scientific excellence, independence, and potential for future research contributions. While the Peter Harris Award recognizes lifelong accomplishments and the Richard Bing Award recognizes young investigators, the Outstanding Investigator Award (presented annually) is targeted at established investigators who are in the intermediate phase of their academic career.

In non-Congress years, the Outstanding Investigator Award is presented at the meeting of the ISHR Section to which the winner belongs. The winner presents a major lecture and receives a \$3,000 honorarium and a plaque. An announcement of this Award is published in *Heart News and Views*, and posted in the ISHR website. The winner receives free registration and reimbursement for travel expenses (up to a maximum of \$1500 when the recipient delivers the lecture at his/her local Section meeting, and \$3,000 when inter-continental travel is required).

Nominations for the Outstanding Investigator Award are sought by the Secretary General from members of the International Council, members of the Editorial Board of the *Journal of Molecular and Cellular Cardiology*, and the Councils of ISHR Sections. In addition, the Secretary General publishes an open invitation in the ISHR Website for members to submit nominations.



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ISHR

International Society for Heart Research

## The Outstanding Investigator Award 2015



Award Winner

Dr. Thomas Thum

“microRNAs and the heart -  
What comes next ? ”

# Thomas Thum, Ph.D.

## 2015 Award Winner Bordeaux, France

Dr Thum studied medicine at the Hannover Medical School in Germany and finished his MD in 2001. He then worked at the Department of Clinical Pharmacology as well as at the Fraunhofer Institute ITEM (Hannover) from 2001-2004. From 2004 he worked as a Physician/Scientist at the Julius-Maximilians University in Würzburg, Germany and became a specialist in Internal Medicine and Cardiology and group leader in the Interdisciplinary Center of Clinical Research on the topic of “Cardiac Wounding and Healing“. In parallel, he finished a PhD degree at the National Heart and Lung Institute of the Imperial College in London under the guidance of Prof Philipp Poole-Wilson. In 2009 he was recruited through the German Excellence Initiative as a Full Professor and Director of the Institute of Molecular and Translational Therapeutic Strategies (IMTTS; Hannover Medical School). From June 2013 he additionally works as a visiting Professor of Cardiology at the Imperial College in London. Dr Thum has received many national and international awards such as the Outstanding Achievement Award of the European Society of Cardiology in 2011. Dr Thum is a Fellow of both the European (FESC) and American Society of Cardiology (FAHA).

Dr Thum serves on a number of grant review panels in Europe and is a member of several editorial boards including *Circulation Research* (Consulting Editor); *Arteriosclerosis, Thrombosis, and Vascular Biology*; *J Mol Cell Cardiology* (Associate Editor); *Basic Research in Cardiology*; and the *American Journal of Physiology – Heart and Circulatory Physiology*.

Dr Thum has made many ground-breaking discoveries in the field of non-coding RNAs. He pioneered the use of an oligonucleotide-based therapy of heart diseases (Nature, 2008); especially he developed a strategy to block miRNA-21 to treat cardiac fibrosis. This research stimulated many other researchers and resulted in an overall strategy to modulate fibrosis in many other diseases. MicroRNAs are short non coding RNA molecules that target networks of genes and thus have been shown to be interesting drug targets. Together with colleagues in his lab, Dr Thum developed a method for the high throughput identification of functional miRNAs. A robot-based system was set up to transfect hundreds of miRNAs in parallel to cardiovascular cells. By this strategy Thum and his colleagues identified the

miR212/132 cluster that has a dramatic role in the cardiac remodeling process and cardiac autophagy (Nature Commun, 2012). Importantly, inhibition if miR-132 blocked development of pathological hypertrophy and heart failure.

Additionally, Dr Thum is interested in the development of new diagnostic strategies for cardiac patients. He published the first paper showing that circulating miRNAs may also have prognostic information for patients with myocardial infarction. He also identified specific miRNA blood and urinary signatures in various other diseases such as kidney disease, neurological and liver diseases. His laboratory also functions as a core lab for miRNA collaborative research (<http://www.mh-hannover.de/imtts.html>).

Recently, Dr Thum and colleagues have shown that cardiac cells can communicate with each other by shuttling vesicle-embedded miRNAs back and forth. This new communication system can be manipulated for therapeutic reasons (J Clin Invest, 2014). Interestingly, Thum found that selected miRNA passenger strands (“star strands“ that previously were believed to be mainly degraded within the cell) are specifically packed into exosomes and then secreted by the cell. Uptake of fibroblast secreted exosomes was able to induce cardiomyocyte hypertrophy showing the first miRNA based communication system between fibroblasts and cardiomyocytes.

Dr Thum’s recent research interests are in the field of cardiovascular long non-coding RNAs, which are defined as non-coding RNAs larger than 200 nucleotides in length. He has shown that these “lncRNAs“ can be also observed in the plasma of cardiac patients and may be of use in diagnostics and prognostic evaluation of patients (Circ Res, 2014).

As a cardiologist Dr Thum is also involved in clinical activities and is responsible for the Outpatient Clinic on Hypertrophy Cardiomyopathies at the Department of Cardiology and Angiology of the Hannover Medical School. Together with Dr Sessa from Yale University Dr Thum was recently granted with a prestigious transatlantic Leducq network grant, that he is coordinating in the field of cardiovascular microRNAs with the vision to bring miRNA therapeutics into clinical application in cardiac disease.

Dr Thum’s research on non-coding RNAs in cardiovascular research and associated fields of research provided new insight into the mode of action of various pathologies of the heart. He has developed major breakthroughs in both diagnostic and therapeutic approaches for cardiac diseases. Overall, his successful track record as a scientific investigator, translational scientist and Institute Director has established him as a leader in cardiovascular sciences.

### *Previous Award Winners....*

**Åsa Gustafsson, Ph.D.**  
(Miami, FL: 2014)

**Deepak Srivastava, M.D.**  
(San Diego, CA: 2013)

**Thomas Eschenhagen, M.D.**  
(Belgrade, Serbia: 2012)

**Walter J. Koch, Ph.D.**  
(Philadelphia, PA: 2011)

**Jeffrey D. Molkenin, Ph.D.**  
(Kyoto, Japan: 2010)

**Mathias Gautel, M.D., Ph.D.**  
(Nice, France: 2009)

**Joseph Loscalzo, M.D.**  
(Toronto, ON: 2006)

**Eric Olson, Ph.D.**  
(New Orleans, LA: 2005)

**Issei Komuro, M.D., Ph. D.**  
(Tokyo, Japan: 2003)

**Peter Carmeliet, M.D., Ph.D.**  
(Szeged, Hungary: 2002)