

ISHR Research Achievement Award

The purpose of this Award is to recognize a prominent scientist (1) who has a distinguished track record of innovative scientific contributions that have had a major impact on our understanding and/or treatment of cardiovascular disease and (2) who is likely to continue to make major contributions in the future. The main criteria for selecting awardees are scientific excellence and potential for future research contributions. While both the Outstanding Investigator Award (OIA) (awarded annually) and the Research Achievement Award (RAA) recognize established investigators, the OIA is targeted at more junior individuals (at least Assistant/Associate Professor or the equivalent), while the RAA is targeted at more senior individuals (full Professors or the equivalent).

The Research Achievement Award is presented at the triennial ISHR World Congress or, in non-Congress years, at the annual meeting of the ISHR Section to which the winner belongs. The Award consists of a plaque and a monetary prize of \$3,000, which will be used to support the research program of the awardee. An announcement of this Award, along with a photograph and a biosketch, will be published in *Heart News and Views*, and posted in the ISHR website.



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International Society for Heart Research

The Research Achievement Award 2017



Award Winner

Dr. Rong Tian

“Navigating the Metabolic
Maze: Do we see the light?”

Rong Tian, M.D., Ph.D.

2017 Award Winner

New Orleans, Louisiana

Rong Tian was born in Chengdu, China. She obtained her MD from the West China University of Medical Sciences in 1986 and her PhD in Pharmacology in 1992 from Aarhus University in Denmark. After a short period of research in Germany, she went to Brigham and Women's Hospital and Harvard Medical School for her postdoctoral training with Joanne Ingwall on *in vivo* NMR spectroscopy and bioenergetics of the heart. She stayed on as faculty and rose through the ranks at Harvard Medical School until 2009 when she was recruited by the University of Washington to establish a multidisciplinary center on mitochondria and metabolism. She is currently professor and center director at the UW School of Medicine in Seattle.

Dr. Tian's research program focuses on myocardial metabolism and energetics. Her science is prominent in three cutting edge and inter-related areas: bioenergetics, metabolism and mitochondrial biology. In the past twenty years, her laboratory has made seminal contributions to the field by combining the multi-nuclear NMR spectroscopy of genetically engineered mouse models with the powerful technology of genomics, proteomics and metabolomics. Dr. Tian's contributions to cardiac substrate metabolism, AMP-activated protein kinase (AMPK) signaling cascade and mitochondrial function have challenged the dogma and have brought vitality to a classic field. Her studies address important clinical problems as heart failure becomes a predominant diagnosis in our aging and obese population, and her discoveries are recognized as translational "game changers" in cardiovascular medicine.

At the turn of the century, provocative studies by the Tian laboratory demonstrated that mice with increased glucose transport and utilization in the heart not only did not suffer from "glucose toxicity" but also had increased tolerance to chronic pressure overload accompanied by delayed transition to heart failure. Her subsequent study on the regulation of cardiac metabolism by substrate availability has revealed a critical role of metabolic flexibility for normal cardiac function and has shed new light on the pathogenesis of cardiac gluco- and lipotoxicity, an emerging focus for the field of cardiovascular and metabolic disorders.

More recent work from her laboratory by targeting the acetyl-CoA carboxylase 2 (ACC2) has demonstrated the significance of sustaining fatty acid oxidation in the failing hearts, which was initially controversial but quickly proven to be highly stimulating for the field. Her work continues to be innovative and addresses the biological role of substrates, such as glucose, fatty acids and amino acids metabolism in the control of growth signaling and stress responses of the heart. Dr. Tian's work on metabolic signaling has identified the AMPK pathway as an intermediary linking impaired energetics and metabolic remodeling in the hypertrophied myocardium. The Tian laboratory has also uncovered mechanisms underlying the human cardiomyopathy caused by point mutations of the gamma2 subunit of AMPK (encoded by *Prkag2*). She is recognized as the world expert in the pathogenesis of PRKAG2 cardiomyopathy. Dr. Tian's recent effort using genetic mouse models of defective mitochondrial function as a discovery tool has identified mitochondrial protein hyperacetylation as a mechanism

for increased cardiac susceptibility to stresses. Subsequent work in heart failure animal models and patients has revealed molecular mechanisms linking NAD⁺-dependent protein hyperacetylation and heart failure progression, suggesting that NAD⁺/NADH ratio is a viable therapeutic target for mitochondrial dysfunction and heart failure.

Dr. Tian is an avid volunteer for the research community. She has served on the editorial board of *Circulation*, *Circulation Research*, *PLOS Biology* and the *Journal of Molecular Cellular Cardiology* in the capacity of consulting editor, section editor and board members. She is the Established Investigator of the American Heart Association, recipient of the Research Achievement Award from the AHA Basic Science Council, and the Bernard and Joan Marshall Distinguished Investigator Lecturer of the British Society for Cardiovascular Research.

Past Award Winners...

Heping Cheng, Ph.D.

2016: Buenos Aires, Argentina

Mark Anderson, M.D., Ph.D.

2015: Seattle, WA, USA

Eric Olson, Ph.D.

2013: San Diego, CA, USA

Jeffrey Robbins, Ph.D.

2010: Kyoto, Japan

Martin Lohse, M.D.

2007: Bologna, Italy

Roberto Bolli, M.D.

2004: Brisbane, Australia

Eduardo Marban, M.D.

2001: Winnipeg, Manitoba