ISHR Research Achievement Award

This Award recognizes an internationally prominent scientist with a sustained and distinguished record of major scientific achievements in the field of cardiovascular research. Awardees will have already had, and are expected to continue to have, a major impact on our understanding and/or treatment of cardiovascular disease. While both the Outstanding Investigator Award (OIA) 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 one of the ISHR Section meetings on a rotating basis. The Award consists of a plaque and a monetary prize of $1,500. 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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Award Winner
Dr. Issei Komuro

“Precision medicine for heart failure based on molecular mechanisms”
Issei Komuro, MD, PhD
Beijing, China

Dr. Komuro started his research career by purifying cardiac myosin heavy chain isoforms in Dr. Yoshio Yazaki’s laboratory at the University of Tokyo in 1985. Based on the hypothesis that similar mechanisms are involved in cell hypertrophy and proliferation, he next examined the expression of protooncogenes during the course of hypertrophy. He also first cloned SERCA2 from the rat heart and demonstrated its downregulation at mRNA and protein levels in hypertrophied hearts. In 1987, he developed the system to stretch cultured cardiomyocytes and studied signal transduction processes involved in the development of cardiac hypertrophy induced by mechanical stress using expressions and the promoter activity of c-fos gene. He first applied molecular biology and biochemistry to analyze the molecular mechanism of mechanical stress-induced biological events. He demonstrated that mechanical stress itself can activate angiotensin II type 1 receptor without the involvement of angiotensin II by changing its conformational structure. From 1989 to 1993, he was a postdoctoral fellow at Dr. Izumo’s laboratory of Beth Israel Hospital/ Harvard Medical School in Boston. He succeeded in isolating the cardiac homeobox protein Nkx2.5 (first named Csx), a transcription factor essential for cardiac development. The discovery of Nkx2.5 greatly stimulated the study of cardiac development, and Nkx2.5 has been used world-wide as an early marker of the heart.

After returning to Japan, he isolated human Nkx2.5 and determined the locus of this gene, which later led to the discovery that Nkx2.5 is one of the genes responsible for various congenital heart diseases. He clarified the molecular mechanism of Nkx2.5 involvement in cardiac development by identifying Tbx5 as an Nkx2.5-associated protein. In 2001, he became a professor and chairman of cardiovascular medicine at Chiba University where he led over 80 doctors in clinical work as well as research. He proposed a novel hypothesis that inhibition of angiogenesis by p53 induces transition from cardiac hypertrophy to heart failure. He also elucidated the biphasic role of Wnt in cardiac development and identified a novel Wnt inhibitor IGFBP-4, which is critical for cardiac maturation during embryonic stage. He became a professor and chairman of cardiovascular medicine at Osaka University in 2009 and The University of Tokyo in 2012, both of which are top cardiac transplantation centers in Japan and he has further focused on molecular mechanisms of heart failure. He has reported that accumulation of mitochondrial DNA and damage of somatic cell DNA cause inflammation in the heart, resulting in heart failure. He has also reported that complement C1q is a senescence-promoting factor by activating Wnt signaling leading to various cardiovascular diseases. He has recently identified that p53 exists at the critical point between adaptation and failure by single cell RNA sequence analysis.

Dr. Komuro is a pioneer in, and has made great contributions to, the research fields of cardiac hypertrophy and development. His work has provided valuable insights into the pathophysiology of cardiac diseases; for example, elucidation of the molecular mechanism of mechanical stress-induced cardiac hypertrophy and heart failure. Originality is a feature of Dr. Komuro’s research and he is also a highly productive man. He has published over 800 original articles, many of which have appeared in leading journals including *Nature, Cell, Nature Medicine and Circulation*. He has also published 130 book chapters/review articles, is a regular speaker at national and international meetings, and served as an associated editor of *Circulation Research* and is an editorial board member of *Journal of Clinical Investigation, Circulation, ATVB* and *Journal of Molecular and Cellular Cardiology*.

Past Award Winners...

Joseph Hill, MD, PhD
2018: Nanjing, China

Rong Tian, PhD
2017: New Orleans, LA, USA

Heping Cheng, PhD
2016: Buenos Aires, Argentina

Mark Anderson, MD, PhD
2015: Seattle, WA, USA

Eric Olson, PhD
2013: San Diego, CA, USA

Jeffrey Robbins, PhD
2010: Kyoto, Japan

Martin Lohse, MD
2007: Bologna, Italy

Roberto Bolli, MD
2004: Brisbane, Australia

Eduardo Marban, MD
2001: Winnipeg, Manitoba