

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 triennially at the ISHR World Congress, where the winner presents a major lecture. The Award consists of a plaque and a monetary prize of \$10,000, 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.

*This award is funded by a generous contribution
from Chugai Pharmaceutical Co.*



International Society for Heart Research

President

M Hori, *Japan*

President Elect

M Avkiran, *UK*

Past President

R Bolli, *USA*

Secretary General

R Moss, *USA*

Treasurer

E Murphy, *USA*

Journal Editor

D Eisner, *UK*

Bulletin Editors

Leslie Anderson Lobaugh, *USA*

T Ruigrok, *The Netherlands*

Council 2010-2013

M Avkiran, *UK*

D Bers, *USA*

R Bolli, *USA*

K Clarke, *UK*

L Delbridge, *Australia*

D Eisner, *UK*

T Eschenhagen, *UK*

P Ferdinandy, *Hungary*

K Fukuda, *Japan*

S Houser, *USA*

M Hori, *Japan*

R-T Hui, *China*

T Izumi, *Japan*

L Kirshenbaum, *Canada*

I Komuro, *Japan*

E Kranias, *USA*

M Kurabayashi, *Japan*

R Moss, *USA*

E Murphy, *USA*

C Patterson, *USA*

B Pieske, *Germany*

D Saint, *Australia*

R Schulz, *Germany*

M Sussman, *USA*

KK Talwar, *India*

M Vila-Petroff, *Argentina*

R-P Xiao, *China*



International Society for Heart Research

The Research Achievement Award 2013



Award Winner

Dr. Eric Olson

“The Molecules and Mechanisms
of Heart Development, Disease
and Regeneration”

2013 Award Winner

San Diego, CA, USA

Eric Olson, Ph.D.

Eric Olson is professor and chair of the Dept of Molecular Biology at the University of Texas Southwestern Medical Center in Dallas, where he also holds the Robert A. Welch Distinguished Chair in Science, the Pogue Distinguished Chair in Research on Cardiac Birth Defects, and the Annie and Willie Nelson Professorship in Stem Cell Research.

Dr. Olson attended Wake Forest University, receiving a B.A. in Chemistry and Biology and a Ph.D. in Biochemistry. He later also received an honorary doctorate from his alma mater. After postdoctoral training at Washington University School of Medicine, Dr. Olson assumed his first faculty position at MD Anderson Cancer Center in 1984, where he became Professor and Chair of Biochemistry and Molecular Biology in 1991. In 1995, he founded the Department of Molecular Biology at UT Southwestern.

Dr. Olson was an early pioneer in the discovery of the major cardiac transcription factors and showed how these factors function within an evolutionarily conserved gene regulatory network to orchestrate heart formation in organisms ranging from fruit flies to mammals. Dr. Olson discovered the MEF2 transcription factor, which activates the genes required for sarcomere formation and cardiac contractility. He and his colleagues discovered the first chamber-restricted cardiac transcription factors, Hand1 and Hand2, and demonstrated that they control growth of the left and right ventricles, respectively, and recently showed that four cardiac transcription factors (Gata4, Hand2, Mef2C and Tbx5) can reprogram cardiac fibroblasts into beating cardiomyocytes within the intact heart following myocardial infarction, diminishing scar formation and enhancing cardiac function. These findings offer a promising new strategy for heart repair, bypassing many of the obstacles associated with other approaches.

Dr. Olson discovered the myocardin family of transcriptional coactivators, which function as master regulators of cardiovascular gene expression. Other important cardiac transcription factors discovered by Dr. Olson include, the homeodomain-only protein (HOP), which regulates cardiomyocyte cell number during development; the HRT family of transcription factors, which mediate Notch signaling in

early heart formation; and CAMTA, which functions as a calcium-dependent regulator of heart growth.

In recent studies, Dr. Olson and colleagues found that the hearts of neonatal mice can fully regenerate after partial surgical resection, but this capacity is lost early in life due to irreversible suppression of cardiomyocyte proliferation. These findings demonstrate a previously unrecognized regenerative capacity of the mammalian heart and have provided a powerful new model for uncovering the molecular basis of heart regeneration.

In earlier studies, Dr. Olson was the first to recognize the importance of the calcium-dependent protein, calcineurin, in cardiac hypertrophy and failure, opening a new direction for the field of molecular cardiology. He also showed calcium-dependent protein kinases control the molecular interaction between MEF2 and class II histone deacetylases (HDACs), providing a trigger for stress-dependent remodeling of the heart. Olson's discovery that HDACs function as key regulators of cardiac gene expression led to the advancement of HDAC and HDAC kinase inhibitors as new classes of cardio-protective drugs, currently in clinical development.

Most recently, Dr. Olson discovered signature patterns of microRNAs associated with cardiovascular development and disease and showed how microRNAs regulate numerous facets of cardiovascular biology, including myocyte growth and survival, contractility, energy metabolism, fibrosis, and angiogenesis. He discovered that myosin heavy chain genes encode microRNAs in their introns and that these microRNAs control cardiac gene expression and contractility. Thus, myosin genes not only encode the major contractile proteins of muscle but act more broadly to control the gene expression programs and functions of striated muscles through the expression of a family of intronic microRNAs. The dual functions of myosin genes, encoding both protein and microRNA, serve as a paradigm for the integration of microRNAs with complex cellular processes. In the course of these studies, Dr. Olson uncovered a central role for the heart in the control of systemic energy homeostasis and metabolism via a microRNA regulatory circuit, providing a new entry point into the pathways of obesity and metabolic syndrome.

The many genes and regulatory mechanisms discovered by Dr. Olson have established new principles of gene regulation and have provided novel therapeutic targets for normalizing cardiac function in the settings of congenital and acquired heart disease. Toward that end, Dr. Olson has cofounded several biotechnology companies to advance studies from his lab toward clinical applications.

Dr. Olson is a member of the American Academy of Arts and Sciences, the U.S. National Academy of Sciences, and the Institute of Medicine. His awards include the Pasarow Award in Cardiovascular Medicine, the Pollin Prize in Pediatric Research, and the Passano Prize. In 2009, the French Academy of Science awarded Dr. Olson the Fondation Lefoulon-Delalande Grand Prize for Science. He is also a recipient of the Basic Research Prize, the Research Achievement Award and the Inaugural Distinguished Scientist Award from the American Heart Association. In 2013, Dr. Olson received the March of Dimes Prize in Developmental Biology.

Dr. Olson has trained successive generations of students and postdoctoral fellows, many of whom are emerging as leaders in cardiovascular medicine. In his spare time, Dr. Olson plays guitar and harmonica with the Transactivators, a rock 'n' roll band inspired by the Texas icon, Willie Nelson, who established the Professorship that Olson holds.

Past Award Winners...

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