Peter Harris, M.D., Ph.D.
1923 - 2002

Peter Harris was an influential international statesman in cardiology. A science scholar at King's College, London, UK, Harris trained in medicine at Kings College Hosp., qualifying in 1946. During house appointments at King's and the Brompton Hosp., he obtained his MD in 1951, winning the university gold medal and a PhD in 1955. He was appointed lecturer, in 1957, and reader in medicine, in 1962, at Birmingham University. In 1966, he was appointed the first Simon Marks' Professor of Cardiology at the Cardiothoracic Institute and Director of the Institute of Cardiology, in the Univ. of London.

His career, which was dedicated to exploring the cardiovascular system and the origins of heart disease, can be viewed as three chapters. During the 1950's and early 1960's, he was in the mainstream of research, and used established methods of haemodynamic measurements to explore cardiac output and pulmonary blood flow and the metabolism of the heart muscle. [During]…the second stage of his career …his research into the heart muscle turned to experiments at the cellular and molecular level. In 1970, Harris organized a meeting of …an international study group for research in cardiac metabolism, which resulted in the publication of one of the most influential works on cardiology: *Calcium and the Heart.* The third element to Harris's career involved his fascination with the evolution of the cardiovascular and related systems. In a series of essays in 1983, he traced the way that the origins of clinical heart failure might lie in ancient reflexes. His study of the right ventricle of the heart and the blood flow to the lungs of yaks showed they had adapted genetically to high altitude by eliminating the vasoconstrictor response due to reduction of oxygen.

Away from the laboratory, he was a talented musician and artist, and he showed a leaning toward satirical writing. His wife Francesca survives him.

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About the Award…

Created in 1986, this very distinguished Award of international importance is the highlight of each World Congress of the ISHR. It is conferred in recognition of a lifetime of distinguished scientific achievements in the field of cardiovascular research.

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The Peter Harris Distinguished Scientist Award 2017

Peter Harris, M.D., Ph.D.
1923-2002

Award Winner

R John Solaro, PhD

"Sarcomeres as hubs of signaling in the heart"

2017 Award Winner

R John Solaro, PhD New Orleans, LA, USA

R. John Solaro served as Head of the Department of Physiology and Biophysics at University of Illinois at Chicago (UIC) from 1988 to 2015. He moved to UIC from the University Of Cincinnati College Of Medicine. He trained for the PhD in the Department of Physiology, at University of Pittsburgh School of Medicine and in 1971 immediately moved on to a faculty position at the Medical College of Virginia. His undergraduate degree is in Pharmacy from the University of Cincinnati. In 1975-76 he was a Fellow of the American and British Heart Associations and worked with Professor S. V. Perry in Birmingham, England. In 1987 he was a Fogarty Fellow working with David Allen at University College London. Solaro was appointed Distinguished University Professor in the University of Illinois System in 1998. He is currently director and founder of the UIC Center for Cardiovascular Research. At UIC, Solaro received the University Scholar Award, the Faculty of the Year Award, the Mentor of the Year Award, and the Distinguished Service Award. Solaro was a member of the NIH Physiology study section, and is past Chair of the Skeletal Muscle and Exercise Physiology and the Cardiovascular Sciences study sections. He has served as Associate Editor and has been elected as Editor-in-Chief of the *Journal of Molecular and Cellular Cardiology* beginning in 2017. He is past Associate Editor of the *American Journal of Physiology (Heart)*. He has also served on the editorial boards of *Circulation Research, the Journal of Clinical Investigation,* and *the Journal of Biological Chemistry*.

In his PhD studies with Dr. F. Norman Briggs, Dr. Solaro developed a method for the study of myofilament proteins using "detergent skinning" with Triton X-100. Since its publication in 1971, this method is employed worldwide to investigate sarcomeric function without interference of membrane controlled processes. Using this approach in his PhD work, Dr. Solaro was able to establish the Ca requirements for activation of myofilaments thereby establishing the significance of the relative roles of the SR and mitochondria as sources of Ca. Later work with Dr. Jim Potter established that activation of cardiac muscle occurred with binding of Ca to a single site on troponin C. Using the data in an analog computer model of Ca-fluxes in the heart cell, it became apparent that modulation of Ca control of cardiac myofilaments could be a more significant regulator of cardiac dynamics than appreciated at the time. This idea developed strongly with evidence that cardiac troponin I (TnI) could be phosphorylated in vitro by PKA, which stimulated Dr. Solaro to move to England in 1975 and work with S.V Perry and colleagues, who had identified the sites and developed affinity methods for isolation of TnI. The year of work resulted in a paper published in Nature reporting the phosphorylation of cardiac TnI at its unique N-terminus in the beating heart with the induction of a desensitization of myofilaments to Ca. The data provided seminal information on the now accepted idea that myofilament response to Ca is involved in adrenergic control of cardiac dynamics. A series of papers employing Ca-binding, FRET, and solution NMR further clarified the mechanism of the effect of the phosphorylation. In collaboration with Dr. Litsa Kranias, Solaro published another paper in Nature reporting that both phospholamban and TnI are phosphorylated in the beating heart. These data led the way to investigations of the role of other sarcomeric protein phosphorylations and other post-translational modifications in control of the heartbeat. With the knowledge that neonatal hearts are highly resistant to acidotic stress together with the discovery that the neonatal isoform of TnI is slow skeletal TnI, Solaro returned to England in 1987 as a Fogarty Fellow working with Drs. David Allen and Jon Kentish. The studies using the aequorin technique to measure force and Ca showed that indeed force fell in the heart preparations with no change in systolic Ca and the fall in tension was blunted significantly in the neonatal heart. Later studies employing an adult mouse expressing ssTnI in heart demonstrated a protective effect against a variety of stresses associated with the induction of sensitization to Ca and metabolic remodeling. In 1979, working together with Drs. Caspar Ruegg and Joachim Herzig in Germany the idea developed regarding the possibility of developing drugs directly enhancing myofilament response to Ca. A 1982 paper in Circulation Research with Dr. Ruegg is a seminal paper supporting this idea. Since that time several drugs have made it to the clinic, and development of sarcomere activators and inhibitors continues to be pursed in biotech and pharma. Solaro's work was instrumental in emphasizing the role of sarcomeres not only as force and shortening machines, but as hubs of cell signaling. Modifications in Z-disk proteins provided evidence in support of this now generally accepted concept. The idea that myofilament length and strain provides a source of mechano-transduction is a dominant theme in the laboratory with a focus is on the integration of signaling and signal transduction at the level of cardiac sarcomeres. Linkage of common cardiomyopathies to mutations in sarcomere proteins provided a strong underpinning for the further investigation of how a specific change at the level of the sarcomeres can induce adaptive and maladaptive cardiac remodeling. Current translational studies together with Drs. Pieter deTombe, Brenda Russell, and Beata Wolska, focus on prevention and reversal of familial cardiomyopathies by therapeutic approaches involving modification of sarcomere mechano-signaling via sphingolipid signaling, biased ligands at the AT1R, and by agents directly affecting sarcomere activation and de-activation. Dr. Solaro has published 380 peer reviewed papers, and his work has been continually funded by the National Institutes of Health since 1977.

Past Award Winners

Donald M Bers, USA, 2017
Roberto Bolli, USA, 2015
Jonathan Lederer, USA, 2015
Evangelia Kranias, USA, 2014
Masatsugu Hori, Japan, 2013
James M. Downey, USA, 2010
David J. Hearse, UK, 2007
Arnold M. Katz, USA, 2004
Robert J. Lefkowitz, USA, 2001
Lionel H. Opie, South Africa, 1998
Howard E. Morgan, USA, 1995
Robert B. Jennings, USA, 1992
Albrecht Fleckenstein, Germ, 1989
Setsuro Ebashi, Japan, 1986