The 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 lifetime 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 one of the ISHR Section meetings on a rotating basis. The winner presents a major lecture and receives a $1,000 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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**Award Winner**
Dr. Benjamin Prosser

“Cardiac Microtubules: Control of Myocyte Mechanics, Transport, and Growth”
Benjamin Prosser, PhD

2022 Award Winner
Berlin, Germany

Dr. Benjamin (Ben) Prosser is an Associate Professor of Physiology at the University of Pennsylvania Perelman School of Medicine and Associate Director of the Pennsylvania Muscle Institute. His interest in muscle physiology was sparked during undergraduate work on biomechanics at Wake Forest University, cemented during his Ph.D. on Excitation-Contraction Coupling with Dr. Martin Schneider at the University of Maryland, and focused to the heart during a postdoctoral fellowship with Dr. Jon Leeder.

During his postdoc, Dr. Prosser identified a mechanobiology pathway whereby the fundamental calcium signals that drive muscle contraction are tuned by forces transmitted through the cytoskeleton (Prosser, Science 2011). This initial foray into the cytoskeleton continued when Dr. Prosser started his own group at Penn in 2014, where the lab has focused on the microtubule cytoskeleton and its contribution to cardiac mechanics and mechanobiology. Recently, a second focus was added to develop novel therapies for inherited brain disorders, stemming from Dr. Prosser’s daughter’s diagnosis with a rare neurodevelopmental disease.

In its initial years the Lab worked with Carl Zeiss to beta-develop AiryScan microscopy, which was combined with biophysical approaches to visualize the inner workings of the microtubule cytoskeleton in beating heart cells. This exploration defined a previously unappreciated role for microtubules – and for post-translational modifications of tubulin - in regulating the mechanical and contractile properties of heart muscle cells (Robison Science 2016). In 2018, the lab found that suppressing post-translational detyrosination of microtubules can lower myocardial stiffness and robustly improve contractile function in cardiomyocytes from patients with heart failure (Chen, Nature Medicine 2018). A subsequent series of publications from the Prosser Lab and others (Caporizzo, Circulation 2020; Chen and Salomon, Circ Res 2020) have demonstrated the therapeutic potential of targeting these modified microtubules in diverse forms of heart failure.

The lab’s more recent work has focused on fundamental mechanisms of cytoskeletal transport and their essential roles in cardiomyocyte homeostasis and hypertrophy. The lab found that active transport of RNA and ribosomes among microtubule tracks is essential for the proper sub-cellular distribution of the translational machinery, and that this governs highly localized translation in the heart muscle cell (Scarborough and Uchida Nature Communications 2021). These findings have broad implications for the local control of translation, for how sarcomeres are maintained and added, and how muscle cells remodel in hypertrophy and disease. The lab is further exploring how physical forces transmitted through the cytoskeleton affect the shape, epigenetics, and function of cardiomyocyte nuclei, and how this “nuclear mechanobiology” contributes to myocyte development and disease (Cho Dev Cell 2019; Heffler Circ Res 2020, Shah Cell Stem Cell 2021).

In recognition of the lab’s work, Dr. Prosser was named an Outstanding Young Investigator by the American Heart Association (AHA) in 2017 and received the Linda Montague Young Investigator Award, among other distinctions. Dr. Prosser was voted by his peers as chair-elect of the upcoming Gordon Research Conference on Cardiac Regulatory Mechanisms, and also now serves as the North American Coordinator with Dr. Lucie Carrier on a Leducq Transatlantic Network of Excellence focused the cardiomyocyte cytoskeleton.

Dr. Prosser owes any success to his inspiring mentors, relentless lab mates, and phenomenal colleagues both home and abroad, as well as his family (the highest inspiration of all). The lab aims to continue their embrace of new technologies and new ways of thinking to have a powerful impact on fundamental and translational research.

Previous Award Winners….

Sarah Franklin, PhD: 2020
Bin Zhou, MD, PhD: 2019
Steven P. Jones, PhD: 2018
Jolanda van der Velden, PhD: 2017
Xander Wehrens, MD, PhD: 2017
Johannes Backs, MD, PhD: 2016
Thomas Thum, PhD: 2015
Åsa Gustafsson, PhD: 2014
Deepak Srivastava, MD: 2013
Thomas Eschenhagen, MD: 2012
Walter J. Koch, PhD: 2011
Jeffrey D. Molkentin, PhD: 2010
Mathias Gautel, MD, PhD: 2009
Joseph Loscalzo, MD: 2006
Eric Olson, PhD: 2005
Issei Komuro, MD, PhD: 2003
Peter Carmeliet, MD, PhD: 2002