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 lifelong 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 or $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.

### ISHR Outstanding Investigator Award 2019

**Award Winner**

**Dr. Bin Zhou**

“Elucidating the origin of new cardiomyocytes in the adult mammalian heart”
Professor Bin Zhou received his MD in 2002 from Zhejiang University School of Medicine, Hangzhou, China. He studied clinical medicine and received systematic training as a physician. After graduation, he did vascular research at Peking Union Medical College, Beijing, China and received his PhD in 2006. He then moved to the US and joined Dr. William Pu’s laboratory at Boston Children’s Hospital to receive postdoctoral training focusing on cardiovascular research in development and diseases. In 2010, Dr. Zhou returned to China and started his independent research work at Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences. In the past 8 years, his work has made significant contribution to the field of cardiovascular development and regeneration. His research elucidates the developmental origins of coronary blood vessels in the mammalian heart. In addition, his lineage tracing work helps clarify the role of resident stem cells in tissue repair and regeneration. Specifically, his laboratory established many precise lineage tracing models for fate mapping of cardiac stem cells (CSCs) and uncovered their fate decision in normal and pathological conditions. Based on this work, Dr. Zhou has received several distinguished awards and been elected a Fellow of the International Society for Heart Research.

Dr. Zhou’s expertise has been broadly demonstrated by his elegant genetic work in mouse studies that delineate cell origin and fates in cardiovascular development and regeneration. Using new technologies that he developed, his group uncovers the developmental origin of coronary blood vessels in the heart. It has been generally believed that coronary vessels mainly formed in the fetal stage then expanded and remodeled to become a mature coronary vascular system of the postnatal heart. Dr. Zhou’s study showed that a substantial number of coronary vessels are, in fact, formed de novo after birth. Fate mapping studies provided direct genetic evidence that endocardial cells contribute to coronary vessels in the inner myocardial wall of the postnatal heart. His work also elucidated the potential of endocardial cells in the adult stage after myocardial infarction and the cellular sources for new blood vessel formation in the injured heart. Identification of distinct coronary vascular populations and sources may provide new clinically relevant insights into therapeutic neovascularization for treatment of ischemic heart diseases.

Dr. Zhou’s laboratory has also clarified the myogenic potential of putative cardiac stem cells in adult heart regeneration. His lineage tracing study of Kit+ cells showed that Kit is expressed by cardiomyocytes in addition to non-myocytes, providing an alternative explanation for interpreting the fate mapping result of Kit+ cells. By distinguishing Kit+ cardiomyocytes from Kit+ CSCs, his subsequent work showed that Kit+ CSCs do not contribute to new cardiomyocytes in the adult heart. Using new genetic system that labels myocytes and non-myocytes distinctively in the heart, he reported genetic evidence in vivo that non-myocyte to myocyte conversion exists in the embryonic but not the adult heart, raising caution on interpreting the myogenic potential of putative stem cell populations for cardiac regeneration in the adult stage. His fate-mapping study on cardiomyocytes proved that new cardiomyocytes of the injured myocardium are derived from pre-existing cardiomyocytes of the adult heart. Taking advantage of the state-of-the-art technologies in mouse genetics, Dr. Zhou uncovered many cell origins and fate conversions that were unknown previously, providing new information to the fields of developmental biology and regenerative medicine.