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Multi-omics studies in cardiovascular diseases - our experience

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In the precision medicine era, integration of multiple 'omics' technologies will allow us to gain a more complete picture of the constituents and functions of diseases and provide far richer information for predictive modeling of phenotypes. The multiple 'omics' technologies largely refer to high-throughput technologies that have revolutionized medical research. These technologies allow integrative studies at genomic, epigenomic, transcriptomic, proteomic, and metabolomic levels, etc. In cardiovascular diseases, genomics, epigenomics, transcriptomics, proteomics, and metabolomics are particularly important in understanding the mechanisms of the disease. Multi-omics offers the opportunity to understand the flow of information that underlies cardiovascular diseases better than the studies at a single omics level. We have been using these multi-omics technologies in coronary artery disease, heart valvular diseases, and congenital heart diseases. With the multi-omics studies, we now have deeper understanding of the complexity in mechanism of these diseases. This lecture will detail some of our studies as well as views on the prospects in this area.

Biography

Professor Guo-Wei He, MD, PhD (Monash), DSc (Monash) is Vice President and Chief (Academic) and Senior Surgeon of Department of Cardiovascular Surgery, as well as Director, Center for Basic Medical Research, TEDA International Cardiovascular Hospital (from October, 2007-), Chinese Academy of Medical Sciences & Peking Union Medical College, Tianjin, China. Professor He currently also holds Clinical Professor of Surgery, Department of Surgery, Oregon Health and Science University, Portland, OR, U.S.A. and Chair Professor, Zhejiang University as well as Hangzhou Normal University, China. Previously, Professor He was Chair Professor of Cardiothoracic Surgery, Department of Surgery, University of Hong Kong & Honorary Consultant Cardiac Surgeon, The Grantham Hospital, Hospital Authority, Hong Kong and then Research Professor of Surgery & Director, Cardiovascular Surgical Research Laboratory, Department of Surgery, The Chinese University of Hong Kong, Hong Kong and Professor of Surgery at Nankai University. He was also Director, Cardiovascular Research, Starr Academic Center, Providence Heart Institute, Portland OR, U.S.A. Professor He is (or was) a member of editorial board for more than 20 international journals including The Annals of Thoracic Surgery (U.S.A.), World Journal of Surgery (U.S.A.), and The Heart Surgery Forum (U.S.A.). He received a number of science award including First Prize, 2012 Tianjin (China) Natural Science Award. He is awardee of a number of Research Grants from Research Grants Council, Hong Kong, Am. Heart Assoc., St. Vincent Medical Foundation, U.S.A. and more recently from National Science Foundation & The Ministry of Science & Technology, China. Professor He has contributed in a number of books. In addition, as the sole editor, he has published a book entitled: Arterial Grafts for Coronary Artery Bypass Grafting Surgery (Springer-Verlag); this book has been published in two editions now with an additional edition in Chinese. Professor He has had 321 publications indexed by SCI (Science Citation Index, U.S.A.) and 202 full papers including editorials indexed by "Pub Med" including multiple papers in "Circulation".