

Editorial

Mitochondrial research in Asia: A step for the mito-global conference



The Asian Society of Mitochondrial Research and Medicine (ASMRM) has been continuously expanding for the past 16 years. It was established at a small meeting in Kyoto in the Autumn season in 2002 at the occasion of the Second Annual Meeting of Japanese Society for Mitochondrial Research and Medicine (J-Mit). At this small meeting, Prof. Yau-Huei Wei (Taiwan), Prof. Hong Kyu Lee (Korea), and Prof. Masashi Tanaka (Japan) hammered out the bylaws of the ASMRM and confirmed the support by J-Mit. Since then, ASMRM has been holding annual meetings every year in either Korea, Taiwan or Japan, and then China joined us in 2006. To date, members of ASMRM council meeting consist of 25 delegates from Japan, Korea, Taiwan, China, and Singapore. Last year, I (Prof. Yasutoshi Koga) organized the 16th ASMRM and 19th J-Mit joint meeting in Fukuoka, Japan, in which the main theme is "Explore the Mito-World!". More than 40 invited speakers and 300 participants from 19 different countries and regions in the world attended the meeting. The scope of mitochondrial research is rapidly expanding from basic knowledge of biology, physiology to clinical application of the treatment of human diseases associated with mitochondrial dysfunction. It is the time now to establish the global organization "Mito-global" for this important field of biomedical research.

The articles representing a selection of the speakers at the 16th ASMRM and 19th J-Mit joint meeting have been solicited to cover reviews/original papers within the following broad topic areas, namely: mitochondrial dynamics, physiology, reactive oxygen species, biochemistry, immunity, animal model, biomarker, molecular imaging and editorial/education of the history of mitochondrial research. The variety of individual topics covered in this special issue demonstrates both the basic mitochondrial research and translational research in mitochondrial medicine. We discuss the new aspect of mitochondrial functions related to human health and disorders caused by mitochondrial dysfunction.



Yasutoshi Koga is a Professor of the Department of Pediatrics and Child Health, Kurume University Graduate School of Medicine, Japan. After he established the biochemical screening system of mitochondrial disorders at NCNP (with Prof. Nonaka I), he joined the Mitochondrial Research Group at the Department of Neurology, College of Physicians and Surgeons of Columbia University (with Profs. DiMauro S and Schon EA), where he directed his research to mitochondrial genetics, especially pathogenic mechanism of MELAS. He discovered a novel therapeutic procedure and has completed the investigator-mediated clinical trial of L-arginine on MELAS in Japan. He received the Kelsey Wright Award from UMDF in 2008 and in 2014 (corresponding authors). In 2014, he investigated the new

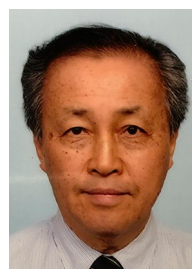
diagnostic biomarker for mitochondrial disorders (growth differentiation factor 15; GDF15) under the collaborative study with Prof. Masashi Tanaka, and succeeded to develop the automated Latex device in 2020. This new therapeutic device will help

mitochondrial patients in early diagnosis and intervention. He is the founding member of J-Mit, president of ASMRM, former president of J-Mit and is always supportive of the mitochondrial patients and their families.



Yau-Huei Wei started studying biochemistry of mitochondria with late Professor Tsou E. King in 1976 and earned his PhD degree in 1980 from the Department of Chemistry, State University of New York at Albany, New York. After postdoctoral training he was recruited as associate professor at the Department of Biochemistry, National Yang-Ming Medical College. He was promoted to professor in 1985 and served as the Chair of the Department and Dean of Student Affairs of the College till 1991. In 2001, Dr. Wei was appointed as the Director General, Department of Life Sciences, National Science Council of Taiwan. He was the Dean of Academic Affairs of National Yang-Ming University (2007–2009). In 2009, Dr. Wei was appointed as Founding President of Mackay Medical College until his retirement in

July 2017. He moved in August 2017 to Changhua Christian Hospital to continue his research. Dr. Wei has been actively participating in the promotion of local and international collaborations in biomedical research and mitochondrial medicine. Dr. Wei and a number of eminent physician scientists from Japan and Korea established the Asian Society for Mitochondrial Research and Medicine, and was elected as the Vice President (2003–2005) and President (2005–2007) of the society. He was the Founding President of Taiwan Society for Mitochondrial Research and Medicine (2007–2012). Dr. Wei has been serving on the editorial board of *Biochimica et Biophysica Acta - General Subjects, Mitochondrion* and *Free Radical Research*. Dr. Wei's research has focused on cell and molecular biological study of mitochondrial disease, aging-related diseases and cancer, the crosstalk between mitochondria and nucleus in the metabolic reprogramming in the differentiation of stem cells. He was the first scientist to show that liver mitochondrial function declines with age and accumulation of mitochondrial DNA (mtDNA) mutations are important events contributing to human aging. His research team was one of the earliest to demonstrate that oxidative stress and metabolic reprogramming elicited by mtDNA mutations contribute to the pathophysiology and feature of mitochondrial diseases. In the past two decades, Dr. Wei and his coworkers have demonstrated that biogenesis and respiratory function of mitochondria and antioxidant defenses are upregulated in a coordinate manner in the differentiation of stem cells and are downregulated in iPSCs formation. He has published more than 430 research papers and review articles in SCI journals in the fields of membrane biochemistry, cell metabolism, mitochondrial medicine, stem cells and iPSCs research.



Masashi Tanaka is a Visiting Professor at the Department of Neurology, Juntendo University Graduate School of Medicine. His group is primarily involved in researching the genetic and molecular basis of mitochondrial diseases. His research contributions include analyzing mitochondrial DNA mutations, proposing sodium pyruvate treatment for mitochondrial diseases, developing a novel biomarker GDF15 for diagnosis of mitochondrial disorders, and surveying new compounds that can activate mitochondrial biogenesis and ameliorate metabolomic alterations caused by mitochondrial DNA mutations. He is also interested in the genetic contribution of longevity and age-related disorders, such as sarcopenia, Parkinson disease, and Alzheimer disease. His current Athlome Project involves

both whole exome association study and whole genome sequencing of elite athletes by next generation sequencers.

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