

Fumihiko Kajiya, M.D., Ph.D. Special Appointed Professor

Kawasaki University of Medical Welfare



Fumihiko Kajiya graduated from Osaka University Medical School in 1965, and received an M.D. in 1966. His Ph.D was awarded from Electronics Engineering, Osaka University in the field of "Compartmental Analysis" in 1977 (related book published by Karger/Corona in 1984).

He served as a Research Associate jointly in the 1st Department of Medicine, Medical School and Electronics Engineering, Osaka University from 1967 to 1977. He moved to Kawasaki Medical School as a professor of Medical Engineering in 1977 and worked there for more than 20 years. He was invited as an international advisor, Imperial College London, Centre for Biological & Medical Systems (1991-1997). He was then invited to the Graduate School of Medicine and Dentistry, Okayama University as a Professor in the Department of Cardiovascular Physiology and BME in 2000. After retirement in 2005, he served as a specially appointed professor, Okayama University and also has been working as a professor of Kawasaki University of Medical Welfare (Vice President:2008-2011). He was a visiting professor of Kyushu University (2011-2014) and is currently at Hokkaido University (2014-).

As for the activity in IFMBE (IUPESM), he served as an AC member (1985-91), Vice President (1991-94) and President (1994-97). During the chair of the "Asia-Pacific" working group, he made efforts to found the IFMBE "Asia-Pacific Conference on MBE" (initially called "Far Eastern Conference"). In 1991, he contributed to organize the Kyoto World Congress on Medical Physics and Biomedical Engineering (President: Hiroshi Abe, Prof.-Emer. Osaka Univ.) as the secretary general, leading to its success with more than 3000 participants. He was Vice President of IUPESM (1997-2000). Our Union joined ICSU in 1999. He served as Chair of International Academy of MBE (2006-2009). Domestically, he was President of Japanese Society for MBE (JSMBE: 1998-2000). He has chaired a number of domestic and international conferences, such as: Japanese Biorheology Society (1982), Conference of Cardiovascular System Dynamics Society (1987), Okayama International Medical Engineering Forum (1994 & 1997), Japanese Society for MBE (1998), and Japanese Society of Microcirculation (2001). He has played important roles in BME fields in Japan in relation to other countries over the years, e.g., Co-chair: Medical Engineering Technology Industrial Strategy Consortium (2004-13), Chair: MBE Section (Basic Medicine) of Science Council of Japan belonging to ICSU (2005-11), and Expert Committee Council for Science and Technology Policy, Cabinet Office, Government of Japan (2005-11). In 2009, he was a deputy chairman of Japan Prize (selection subcommittee on the Technological Integration of Medical Science and Engineering). He acted and is serving as reviewer of various grants in Japan and in other countries.

His research interests lie mainly in cardiovascular BME, such as (1) coronary pathophysiology, (2) in vivo microvisualization and velocimetry of coronary, renal and lung microcirculation, (3) MBE approach to atherogenesis and (4) analysis of coronary and cardiac muscle interaction by SPring-8. He has published over 190 papers (PubMed). He was an associate editor of ASME J Biomech. Engineering (2003-13), and editorial board member of Am J Physiol. (heart & circulatory, 1999-2011) and Med. Biol. Engineering and Computing (2000-05) and so on.

He received the Berz Prize (Boehringer Ingelheim) 1968 & 1973, the Sanyo Press Prize, 1997, the Ogino International Prize (JSMBE), 1999, Honorary Life Member of IFMBE, 2003 and Oka-Shoten Award(Japan Biorheology society), 2004. He is Fellow of American Institute of Medical and Biological Engineering, American Heart Association, American Physiological Society, and IAMBE.

Improvement of Health Care Quality by Medical and Biological Engineering (MBE) with the collabolation of Academia, Industry, the Government and the People

The American Institute for Medical and Biological Engineering (AIMBE) has highlighted nearly 30 medical technologies since the Hall of Fame began in 2005. In subsequent years new technologies were added as the key innovations of the 20th century until now. For example, artificial kidneys, X-ray, ECG, pacemakers, cardiopulmonary bypass, antibiotic production technology and defibrillators up to the 1960's, and since the 1990's genomic sequencing and micro-arrays, PET, image-guided surgery and optical coherence tomography (see AIMBE home page). Virtually, every person has benefitted from these key technical innovations in receiving better health care. For instance, more than 2 million people have hemodialysis treatment in the world (3 hundred thousand in Japan). However, the development of each technology doesn't progress in a straightforward way. As for artificial kidneys, it is well known that many crucial technological developments, such as dialysis-circuits, pumps, vascular access, anticoagulant measures and high performance membranes have been achieved. These are a result of fusion technology from many disciplines. Personally, I have been engaged as a co-chair (2004-13) in the Medical Engineering Technology and Industrial Technology (METIS) in Japan, i.e., Cooperative organization of academia, industry and government. The scope of METIS includes not only medical devices but also science and engineering in health care. From my small experiences, I would like to emphasize the possible improvement of health care quality by future contributions of MBE in the interdisciplinary fusion with the collaboration of academia, industry, the government and the people.

To promote President Obama's Precision Medicine Initiative, cohort study of genome together with MBE, IT and other fields with the participation of the majority of people is very important. For MBE to walk along with society worldwide will be effective route to our goal.