Overview of the 83rd Annual Scientific Meeting of the Japanese Circulation Society
— Renaissance of Cardiology for the Creation of Future Medicine —

Hiroshi Akazawa, MD, PhD; Haruhiro Toko, MD, PhD; Mutsuo Harada, MD, PhD; Kazutaka Ueda, MD, PhD; Satoshi Kodera, MD, PhD; Arihiro Kiyosue, MD, PhD; Katsuhiro Fujii, MD, PhD; Masaru Hatano, MD, PhD; Masao Daimon, MD, PhD; Jiro Ando, MD, PhD; Eiki Takimoto, MD, PhD; Hiroyuki Morita, MD, PhD; Issei Komuro, MD, PhD

The 83rd Annual Scientific Meeting of the Japanese Circulation Society was held in Yokohama, Japan, on March 29–31, 2019, just as the cherry blossoms came into full bloom. Because the environment around cardiovascular healthcare is rapidly changing, it becomes highly important to make a breakthrough at the dawn of a new era. The main theme of this meeting was “Renaissance of Cardiology for the Creation of Future Medicine”. The meeting benefited from the participation of 18,825 people, and there were in-depth and extensive discussions at every session, focusing on topics covering clinical and basic research, medical care provision system, human resource development, and public awareness in cardiovascular medicine. The meeting was completed with great success, and we greatly appreciate the tremendous cooperation and support from all affiliates.

Key Words: International exchange; Prevention; Research; The Stroke and Cardiovascular Disease Control Act; Yokohama Declaration

Overview and Meeting Theme

The 83rd Annual Scientific Meeting of the Japanese Circulation Society (JCS) was held in Yokohama, Japan, on March 29–31, 2019. Yokohama is currently the second largest city after Tokyo in Japan, with a population of 3.7 million. At the end of the Edo Period (1603–1867), when Japan maintained a policy of seclusion, Yokohama was opened as one of the first ports for international trading in 1859. Since then, Yokohama has been the gateway from where many first-time-ever products and information are incorporated into Japan from abroad. The venue PACIFOCO Yokohama (Figure 1A), the largest convention complex in Japan, is located in a seaside urban area, Minato Mirai 21 (Figure 1B), whose name means “port of the future”. As the main theme of this meeting, we adopted “Renaissance of Cardiology for the Creation of Future Medicine”, with the aim of defining solution-oriented strategies and future directions. With the extreme population aging, there has been a drastic increase in the number of cardiovascular morbidity and mortalities in Japan. To cope with this urgent issue, we must breathe new life into the multidisciplinary approach to the future in the field of cardiovascular medicine, while upholding long-held traditions. There were profound and active discussions on this topic in every session during the meeting (Figure 2).

We welcomed 18,825 participants consisting of 14,721 registrants and other people including invited guests from Japan and abroad, citizens attending public events, and management staff. Of a total of 3,153 submitted abstracts (including 132 from overseas), we accepted 2,194 abstracts (acceptance rate, 69.6%). Best Poster Sessions were newly launched to introduce 42 outstanding posters selected from the abstracts accepted for poster presentations (Figure 2D). For the late-breaking sessions, we received 105 abstracts and 36 of them were accepted (acceptance rate, 34.3%). As for the Team Medical Care Session, 6 abstracts were accepted from 8 submitted for the symposium category, and 228 were accepted from 261 submitted for regular oral and poster presentations.

In the Congress Chairperson’s Lecture entitled “Task and Future Outlook of Cardiology: History of 30 Years as a Physician Scientist”, Dr. Issei Komuro (Figure 3A), Professor at the University of Tokyo, looked back at his career as a physician scientist and presented his outstanding scientific achievements ranging from basic research to preclinical and clinical studies. He emphasized the importance of translating novel findings in basic research into novel therapies.
for cardiovascular diseases. In the Mashimo Memorial Lecture (Figure 3B), Dr. Kohei Miyazono, Professor at the University of Tokyo, gave an impressive lecture on his pioneering work on the identification of transforming growth factor (TGF)-β receptors and elucidation of the roles of the TGF-β family signaling in the regulation of cardiovascular homeostasis and diseases. In the Mikamo Lecture (Figure 3C), Dr. Napoleone Ferrara, Professor at the University of California, San Diego, who discovered vascular endothelial growth factor (VEGF) and clarified the mechanism of vascularization, delivered an exciting lecture on translational and clinical significance of targeting angiogenesis for treating cancer and intraocular disorders.

Chairperson-hosted Special Lectures were delivered by Dr. Takashi Kadowaki, Project Professor at the University of Tokyo and Chairman of the Board of Directors at the Japan Diabetes Society, who presented up-to-date research on diabetes from the viewpoint of a physician scientist; Dr. Yoshiyuki Sankai, Professor at the University of Tsukuba, who introduced the development of HAL, the world’s first robot suit designed to support the physical capabilities of the user; and Dr. Jun Miyake, Professor at Osaka University, who delivered a lecture on artificial intelligence as an emerging powerful tool for clinical diagnosis and medical analysis. Other main sessions in the program included 12 Special Lectures, 18 Invited Lectures, 14 Plenary Sessions, 27 Symposia, and 3 State-of-art lectures by International Honorary Member, in which more than 200 leading scientists and physicians were invited from abroad to present the cutting-edge of research outcome and medical care. We hosted 8 Joint Symposia with foreign academic societies such as the American College of Cardiology, the American Heart Association, the European Society of Cardiology, the Asian Pacific Society of Cardiology, the Chinese Society of Cardiology, and the Korean Society of Cardiology.

Opening Ceremony

The Opening Ceremony started with a wondrous and artistic staging consisting of a synchronized fusion of live performance and motion graphics by “enra”, a performing arts company. After the greeting from the Chairperson for the Meeting, it was a great honor to have an inspiring message from Her Imperial Highness Princess Takamado, celebrating the opening of the meeting and hoping for further development of cardiovascular medicine. Thereafter, we heard greetings from the President of the European Society of Cardiology (Dr. Barbara Casadei), President of the American Heart Association (Dr. Ivor J. Benjamin), President of the American College of Cardiology (Dr. Richard Kovacs), President of the Chinese Society of Cardiology (Dr. Junbo Ge), the Vice-Minister for Health in Ministry of Health, Labour and Welfare (Dr. Yasuhiro Suzuki, on behalf of the Minister of Health, Labour and Welfare, Mr. Takumi Nemoto), President of the Japan Medical Association (Dr. Yoshitake Yokokura), and Chairman of the Japan Heart Foundation (Dr. Yoshio Yazaki).

Following the Opening Ceremony, a Special Session Commemorating the 50-year Anniversary of the Japan Heart Foundation was held to look back over the progress of cardiovascular medicine during the past 50 years. Drs. Tetsu Yamaguchi, of the Japan Heart Foundation, and Hiroshi Akazawa, of the University of Tokyo, delivered comprehensive lectures on the past, the present, and the future of catheter intervention and basic cardiovascular research.

Yokohama Declaration

On the second day, the President’s Lecture “Task and Outlook of Cardiovascular Medicine in Japan: Future Direction of the JCS” was delivered by Dr. Issei Komuro, President of the JCS, followed by presentation of the Yokohama Declaration, “Take good care of your heart, and it will keep you healthy in your whole life.”

As the number of elderly people increases, so does the number of patients with heart disease. Because heart failure (HF) is caused by many cardiovascular diseases, which are based on lifestyle-related diseases such as hypertension, diabetic mellitus, and dyslipidemia, we can now prevent HF beforehand by changing lifestyle and managing the progression of these diseases. However, lack of public awareness of the causal relationship between lifestyle and heart disease precludes individuals from preventing and managing HF. So now, the JCS is focusing on prompting people to know more about heart disease. In 2018, the JCS defined “Heart Failure” in simpler terms in its Guidelines for Diagnosis and Treatment of Acute and Chronic Heart
Special Sessions and Events

The program of this meeting had many unique features not seen in past JCS meetings. Feedback from participants was collected by questionnaire surveys using answer pads in some lectures, and a conference comment system was added for certain sessions that allowed participants to send tweet-like comments and questions addressed to speakers via a specialized app. To encourage international exchange among Asian countries, we invited participants from China, Korea, Singapore, Chinese Taipei, and Japan as representatives of their respective countries to compete in a “Doctor JCS – Asian Championship”, in which the 5 countries of excellence competed for the best clinical case presentation and discussion in different fields of cardiology. We congratu-
Coronary Artery Disease

Coronary artery disease (CAD) was still one of the most discussed fields at this meeting, having 440 abstracts adopted.

Arrhythmia

In invited lecture 16 entitled “Catheter Mapping/Ablation of Brugada Syndrome: Japanese Experience”, Dr. Hiroshi Nakagawa (University of Oklahoma Health Sciences Center) showed a new therapeutic strategy for sudden cardiac death in Brugada syndrome. Recently, the epicardial side of the right ventricular outflow tract was reported to be the main substrate of Brugada syndrome. He demonstrated that a catheter ablation approach to this target normalized the Brugada ECG pattern in Japanese patients.

In Plenary Session 4 entitled “New Technology in the Field of Arrhythmia”, Dr. Shih-Ann Chen (Taipei Veterans General Hospital) gave a lecture on the state-of-the-art in arrhythmia therapy. Dr. Masaaki Shoji (National Cancer Center) reported initial results of the first Japanese case of non-invasive robotic treatment for cardiac arrhythmia (CyberHeart). This new technology allows us to perform catheter ablation for atrial and ventricular arrhythmia from outside the body.

In Special Session 2 entitled “Transcend the Current Arrhythmia Diagnosis and Treatment”, 4 outstanding researchers on arrhythmia discussed the basic mechanism of arrhythmia by using new techniques including optical mapping, genetic model, and a new mapping system in animal models and patients. In particular, Dr. Takashi Ashihara (Shiga University of Medical Science) demonstrated the feasibility of real-time visualization of a non-paroxysmal atrial fibrillation system (ExTRA Mapping system) in patients. This system has been already launched in a limited number of hospitals in Japan. Dr. Masatoshi Yamazaki (The University of Tokyo) also reported new mechanistic insights into maintenance of atrial fibrillation using high-speed and high-resolution optical mapping in an animal model.

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HF was one of the most important topics at this meeting, because any cardiac diseases can lead to HF in the terminal state. Especially HF in the elderly, which is an emerging big issue. In Symposium 5 entitled “The Optimal Heart Failure Treatment for the Elderly”, there was lively discussion about optimal management of HF in the elderly based on various registry-embedded clinical trials. Palliative care has come under the spotlight in the management of HF. The Japanese Society for Palliative Medicine – JCS Joint Symposium focused on the need for an inter-professional team approach to palliative care for HF. For treatment of advanced HF, the clinical outcomes of heart transplantation in Japan are among the best in the world. However, the waiting period for HF patients is dreadfully long because of severe donor-organ shortage, and is currently estimated to be more than 5 years. Therefore, technological progress in implantable left ventricular assist devices (LVADs) is crucial. In this situation, 2 new devices (HVAD® and HeartMate 3®) were approved for clinical use in Japan around the time of this JCS meeting. The management of acute decompensated HF has also dramatically changed since Impella® became available. In Plenary Session 8, Dr. JoAnn Lindenfeld (Vanderbilt University Medical Center) and 5 domestic experts in this field discussed state-of-the-art therapy for advanced HF by LVAD. Finally, HF in patients receiving cancer treatment has become a major issue. Because of remarkable progress in fractional flow reserve.

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diseases. In Special Session 3, chaired by Drs. Jeroen J. Bax (Leiden University Medical Centre) and Takahiro Shiota (Cedars-Sinai Medical Center), the importance of multimodality imaging in the field of HF was discussed and gained much attention. Following the keynote lecture by Dr. Bax, Drs. Hirohiko Motoki (Shinshu University), Akira Sato (University of Tsukuba), and Yasuyo Taniguchi (Hyogo Brain & Heart Center at Himeji) showed the exploitation of echocardiography, cardiac computed tomography (CT), and magnetic resonance imaging (MRI), respectively. In symposium 8 entitled “Recent Advance in Cardiac Imaging for Assessment of Myocardial Disorder”, Dr. Joao A. Lima (Johns Hopkins University) gave a keynote lecture about phenotyping of HF with MRI. Because of the significant advancement in therapeutic options for HF, accurate classification using cardiac imaging might be key to establishing the optimal therapeutic strategy in HF.

In the field of echocardiography, the usefulness of stress echocardiography has been noticed not only for CAD, but also for valvular heart disease, pulmonary hypertension, and HF. In the Korean Society of Cardiology-JCS joint symposium, this topic was discussed by a lot of attendees with enthusiasm. In the field of coronary imaging, several investigations presented challenges for functional assessment of CAD. In Symposium 9 entitled “Decision Making for Treatment Strategies and Prediction of Prognosis by the Assessment of Myocardial Ischemia Using Coronary Imaging”, Dr. Gudrun Feuchtner (Innsbruck Medical University) reviewed the current concept of non-invasive determination of myocardial ischemia, with a focus on novel approaches using CT perfusion and CT-based fractional flow reserve. Cardiovascular imaging also plays an important role in the advancement of catheter-based therapy for structural heart disease. A variety of investigations related to this field were presented in several sessions.

Basic Research

Precision medicine, an emerging concept of disease prevention and treatment, incorporates the individual’s clinical and health information with comprehensive data sets comprising transcriptomics, genomics, epigenomics, proteomics, metab-

**Figure 5.** Commemorative photograph of the doctors and staff of the Department of Cardiovascular Medicine, Graduate School of Medicine, The University of Tokyo.
olomics, and microbiomics (i.e., “omics”) for deep phenotyping. In Special Session 7 entitled “The Frontiers of Genomic Science and Medicine,” following the keynote lecture on recent genomic research by Dr. Heribert Schunkert (German Heart Center Munich), Dr. Kaoru Ito (RIKEN Integrative Medical Sciences) presented newly identified pathogenic rare variants in CAD by utilizing the genome-wide association study framework in an extra-large Japanese population. Dr. Seiko Ohno (National Cerebral and Cardiovascular Center) reviewed the recent advances in genetic analyses using next-generation sequencing in inherited primary arrhythmia syndromes. Dr. Seitaro Nomura (The University of Tokyo) presented that, using single-cell transcriptome analysis, a cardiomyocyte trajectory was reconstructed during HF in a murine model. Dr. Yoshihiro Yamanishi (Kyushu Institute of Technology) discussed machine learning-based omics data analysis for drug discovery (Special Session 13 entitled “AMED Genome Project: Implementation of Genomic Technology in Drug Discovery and Development”). Dr. Bart L. Loeyts (University of Antwerp) presented novel causal genes associated with bicuspid aortic valve-related aortopathy, which were identified by a multi-omics approach (Special Session 9 entitled “Molecular Medicine in Hereditary Aortic Aneurysm and Dissection”). Dr. Peipei Ping (University of California, Los Angeles) presented the first machine learning-based integrative analytics approach for unveiling the relationship between oxidative stress-sensitive post-transcriptional modifications and cardiac remodeling (Topic 20, “Transcriptome and Proteome for Cardiovascular Medicine”).

Regenerative medicine has been a focus in basic as well as clinical research for over a decade, and has become more attractive because of new conceptual and methodological discoveries. In Plenary Session 5 entitled “Current Status of the Regenerative Medicine in Cardiovascular Field”, Dr. James F. Martin (Baylor College of Medicine) presented the target genes of Yap, a transcriptional factor regulating cardiomyocyte regeneration, by performing chromatin immunoprecipitation sequencing (ChIP-seq). Dr. Masaki Ieda (University of Tsukuba) presented the state-of-the-art direct reprogramming approach for cardiovascular regeneration and differentiation. Dr. Shigeru Miyagawa (Osaka University) presented a cell-sheet technology as a potential therapeutic strategy for HF. In Plenary Session 12 entitled “Frontier of Basic Cardiovascular Research”, Dr. Eric N. Olson (University of Texas Southwestern Medical Center) provided a genome-wide analysis of transcriptional control of cardiac regeneration and reprogramming. Dr. Shuichiro Higo (Osaka University) discussed the medical application of genome editing for HF.

Closing Remarks

The 83rd Annual Scientific Meeting of the JCS was held at the end of one era and the beginning of another. Emperor Akihito abdicated on April 30, 2019, the day of which was literally the end of the Heisei Era in Japan. The day after the JCS meeting ended in great success, the Cabinet officially announced that the new era is Reiwa. Through the well-organized program and events covering the broad spectrum of cardiovascular medicine, the meeting competently provided opportunities for participants to not only share research achievements, but also gain new ideas for the future.

The long-awaited “The Stroke and Cardiovascular Disease Control Act” was enacted during the extraordinary Diet session held in December 2018. In Japan, this will herald a drastic change in medical practice and research, and the year 2019 will literally mark the beginning of a “new era” in cardiovascular medicine. We believe that this meeting marked the start of a voyage that links the past, the present, and the future of cardiovascular medicine, departing from Yokohama to the rest of the world.

This report was written from a viewpoint of the authors and contributors. Figure 5 is a commemorative photograph of the staff of the Department of Cardiovascular Medicine, Graduate School of Medicine, The University of Tokyo, taken after the meeting was closed.

Acknowledgments

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Disclosures

The authors declare that they have no conflicts of interest to disclose.

References