



Original Article

Congress report: A report of the 16th Congress of the Japanese Society for Regenerative Medicine

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ABSTRACT

The 16th Congress of the Japanese Society for Regenerative Medicine was held from March 7–9, 2017, at Sendai International Center (Sendai city). The theme of this congress was “the renaissance of regenerative medicine” and it was an opportunity for information exchange between industry-leading researchers, doctors/dentists, and industry professionals. The objectives of the congress were to provide a place to promote and develop research in regenerative medicine. Numerous topics were covered in the 1 presidential lecture, 1 congress chair's lecture, 3 special lectures, the special symposia (2 sessions, 10 topics), symposia (41 sessions, 227 topics), evening symposia (3 sessions, 12 topics), joint symposium with another society (1 session, 4 topics), and presentations covering regular presentations including distinct presentations (oral presentations, 2 sessions, 8 topics), oral presentations (65 sessions, 383 topics), and poster presentations (44 sessions, 339 topics). There were co-organized seminars including 31 sessions for co-organized luncheon seminars, 2 sessions for co-organized evening seminars, and an up-to-date technology introduction corner, which hosted 153 organizations. Additionally, 4 special seminars and 3 hands-on training programs were hosted as part of the hands-on learning program for high school students during the congress. There were 3527 participants, and the event was a great success.

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1. Objectives

We decided on “the renaissance of regenerative medicine” as the theme for this congress. The renaissance was an era during the Middle Ages wherein many cultures developed with rapidly increased prosperity. In addition to fostering cultures, the renaissance period greatly influenced art, ideals, religion, politics, and social movements. Regenerative medicine is now truly in its own renaissance; it is receiving support on an economic, industrial, and governmental level in a way that is truly bringing to bear the initial

seeds in this area of research. This congress was held to provide a forum for people from diverse professional backgrounds to think about what they should and can do to contribute to advances in regenerative medicine through exchange of information among people from many occupations, such as foundational medical researchers, clinical medical researchers, people working in the economic and industrial domains, administrators, and pharmaceutical/equipment manufacturers.

2. Participants

There were 3537 participants, from the following backgrounds: 1635 general members, 249 student members, 1035 non-members (960 general, 75 graduate students), 101 university students/high school students (including 32 participants in the hands-on learning program for high school students), 1 high school leader, 473 invitees, and 15 organizing members. In addition to participants with backgrounds in basic medicine, dentistry, clinical medicine, physicians, and dentists, participants also comprised industrial researchers and those with administrative positions.

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3. Lectures

One presidential lecture, 1 congress chair's lecture and 3 special lectures were delivered at this event. The president of the Japanese Society for Regenerative Medicine (JSRM), Dr. Yoshiki Sawa (Osaka University), delivered the presidential lecture entitled, "Goal for universal evolution on regenerative medicine" (Chairperson: Dr. Tsuyoshi Takato (University of Tokyo)). The lecture covered the cooperative drafting of bills for three new acts by the Ministry of Health, Labour and Welfare, the Ministry of Education, Culture, Sports, Science and Technology (MEXT), and the Ministry of Economy, Trade and Industry. These were the "Regenerative Medicine Promotion Act", "Pharmaceuticals and Medical Devices Act", and the "Act on the Safety of Regenerative Medicine" [1–3]. JSRM established the "Standards and basic concepts for biological culture facilities," which formalized the regulations for "JSRM Board Certified Regenerative Medicine Physician/Dentist" and "JSRM Cell Processing Operator", which are meant to guarantee the quality of locations and personnel, in response to the Japanese Society for Regenerative Medicine's call for legislation to provide regulations for the foundational promotion of regenerative medicine in Japan. The initiative by JSRM has also been adopted by the Japan Agency for Medical Research and Development (AMED), meant to "Project to Build Foundation for Promoting Clinical Research of Regenerative Medicine" in the current term, and it has indicated their support for the promotion of regenerative medicine, as a society.

The congress chair's lecture on the topic of "Muse cells as endogenous reparative stem cells; toward generalization of regenerative medicine" was delivered by Dr. Mari Dezawa (Tohoku University), the congress chair of the 16th Congress of the Japanese Society for Regenerative Medicine (Chairperson: Dr. Teruo Okano (Tokyo Women's Medical University)). Muse cells are non-tumorigenic pluripotent stem cells, which were discovered by Dr. Dezawa's research group in 2010 [4–6]. They express a pluripotent stem cell marker SSEA-3 on the surface of the cell membrane and exist in the connective tissue of various organs and circulate in the peripheral blood as well; when tissue damage occurs, they are mobilized from the bone marrow to the peripheral blood, and the cells have receptors for signals released by the damaged tissue, which allows them to home into the damaged tissue. The pluripotency of muse cells allows them to differentiate into tissue-specific cell types after incorporating into the damaged tissue, and contribute to the restoration of tissue function.

The special lectures included the following. Dr. Amit N. Patel (University of Miami, USA) delivered a lecture entitled "Biological synergy for the treatment for advanced heart disease" (Chairperson: Dr. Teruo Okano (Tokyo Women's Medical University)). The lecture encompassed the usefulness of synergistic biological approaches, which he advocated as a new treatment method for advanced heart disease that implement various tissue engineering techniques using stem cell transplants [7]. Dr. Eric N. Olson (UT Southwestern Medical Center, USA) delivered a lecture entitled, "Regenerative strategies for heart and muscle disease" (Chairperson: Dr. Mari Dezawa (Tohoku University)). He discussed the development of new treatment methods for heart disease, using cardiomyocytes induced from fibroblasts through direct reprogramming [8,9], and new treatment methods for Duchenne muscular dystrophy, using CRISPR/Cas9-mediated genome editing [10,11]. Dr. Katarina Le Blanc (Karolinska Institutet, Sweden) delivered a lecture entitled, "Bringing mesenchymal stem cells into the clinic" (Chairperson: Dr. Mari Dezawa (Tohoku University)). The lecture covered the fact that mesenchymal stem cells (MSCs) have immunomodulatory properties, and transplanting them is useful in repairing damaged tissue, but the transplanted cells are only incorporated into the tissue for a limited time; this is because they

undergo an innate immune-attack called an "instant blood-mediated inflammatory reaction (IBMIR)" [12,13]. IBMIRs compromise the survival, engraftment, and function of transplanted cells; however, this problem may be avoided by using MSCs straight after isolating them from the body, or after culturing them for short periods. Based on this, currently doses of low-passage clinical grade MSCs are considered safe, but we should exercise caution with higher cell doses, and particularly higher passage cells that may be used in the future. All of these lectures were well attended; the audience could not fit into one room, so the organizers needed to set up a relay to a separate room to accommodate everyone.

4. Special symposia

Two sessions of special symposia were held. Special symposium 1 was titled, "Challenge to the potential of regenerative medicine." Five lectures were delivered, including one by Dr. Makoto Suematsu, the president of AMED, who discussed the promotion of research in regenerative medicine and the mission of the AMED, and Dr. Tatsuya Kondo, the president of the Pharmaceuticals and Medical Devices Agency (PMDA), who discussed the role of the PMDA based on regenerative medicine products and regulatory science. The organizers of the symposium were Dr. Seiichi Kiso (Life Science Institute Inc., LSII) and Dr. Masaaki Mizuno (Nagoya University Hospital). The title of special symposium 2 was "Current status and future of stem cell treatment on CNS diseases." Five lectures were delivered, including one by Dr. Shinn-Zong Lin (Bio-innovation Center, Tzu Chi Foundation, Taiwan) on the stabilization of motor function in Amyotrophic lateral sclerosis (ALS) model mice and ALS patients, using adipose-derived stem cell transplants [14], and one by Dr. Cesario V. Borlongan (University of Southern Florida Morsani College of Medicine, USA) on 2 methods to suppress neuroinflammation as a secondary injury following traumatic brain injury [15,16]. The symposium organizers were Dr. Teiji Tominaga (Tohoku University), and Dr. Shinn-Zong Lin. Both sessions were especially engaging and successful, and the presenters fielded many questions from the audience.

5. Symposia

Forty-one symposium sessions (227 topics), 3 evening symposium sessions (12 topics), and 1 joint symposium with Japan Research Association for Immunotherapeutics (4 topics) were held. The titles, organizers, and members of these symposia are listed in Table 1. The symposia were vastly interdisciplinary by nature, including sessions on research in regenerative medicine using various stem cells and biomaterials, their clinical applications, tissue engineering, aiming to merge stem cell science and tissue engineering, extremely fundamental regenerative biology and regenerative medicine in animals, administration and the implementation of regenerative medicine from a business point of view, and regenerative medicine education.

6. Regular presentations (distinct presentations, oral presentations, and poster presentations)

The regular presentations comprised 8 distinct presentations carried out in 2 sessions, 383 oral presentations in 65 sessions, and 339 poster presentations in 44 sessions. The regular presentation abstracts were evaluated by the organizing committee and either selected or rejected on the basis of their evaluation. Furthermore, 8 abstracts that were deemed exemplary were presented in 2 distinct presentation sessions, which were separate from the standard oral presentations. The selected distinct presenters were Dr. Ryohei Matsuura (Osaka University), Dr. Kazuya Hashimoto (Kyoto

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