

Symposium Program: The 40th Annual Meeting of the Japanese Society for Biological Sciences in Space

2026.09.12

Presentations highlighted in yellow were selected from the poster presentations and will also be presented as posters.

<Day 1>

Symposium 1	Joint session organized by the Committee for Fostering Young/Next-Generation Researchers and the Young Researchers' Group of the Union of Space and Planetary Habitation Sciences
Date	18-Sep
Symposium Title	Oral Presentation Session for Students and Early Career Researchers
Organizers	Masafumi Muratani (University of Tsukuba) / Shin-ichi Yokobori (Tokyo University of Pharmacy and Life Sciences) / Daisuke Tamaoki (University of Toyama)
Overview	This symposium is primarily intended for undergraduate and graduate students, postdoctoral researchers, and other early-career scientists. It aims to provide presentation opportunities for the next generation of researchers who will lead the future of space biological sciences, while promoting research development and networking through discussion and interaction. Oral presenters are selected from among early-career researchers who submitted general presentations, including volunteers and candidates nominated by the organizers.
Speaker 1	Natsuhiro Takahashi (Showa Medical University) Analysis of the Effects of Hypergravity on Osteoclast Cellular Architecture, Bone Resorption, and Signaling Pathways
Speaker 2	Lena Nieke (The University of Tokyo) Extracellular vesicles remodeling under spaceflight-associated stressors
Speaker 3	Ibuki Sazuka (Kurume Institute of Technology) Analysis of locomotion in <i>Caenorhabditis elegans</i> cultivated under a microgravity environment
Speaker 4	Cécile Renaud (Hokkaido University) Physiological characterization of <i>Physcomitrium patens</i> survival and growth on lunar and Martian regolith simulants
Speaker 5	Sho Sekine (Shibaura Institute of Technology) Evaluation of Endothelial-Immune Cell Adhesion under Simulated Microgravity Using a Clinostat Perfusion Culture System
Speaker 6	Chiaki Shibata (Tokushima University) Effects on Mitochondrial Morphology in a Microgravity Environment: Analysis of the “Cell Gravisensing” Space Experiment

<Day 2>

Symposium 2	
Date	19-Sep
Symposium Title	Life in Space: Frontiers in Biological Imaging

Organizer	Masahiro Chatani (Showa Medical University)
Overview	Advances in visualization technologies at the cellular, tissue, and organismal levels are essential for understanding biological phenomena in space environments. This symposium focuses on cutting-edge imaging approaches for capturing the dynamics of cells, organisms, and plants under microgravity and space-radiation conditions. Through comparisons with ground-based observations and new attempts at real-time imaging, the session will discuss how imaging can deepen space biology research and open new directions for the future.
Speaker 1	Nobuo Suzuki (Kanazawa University) Effects of Melatonin on Spaceflight-Induced Bone Loss: Analysis Using Cultured Fish Scales
Speaker 2	Masahiro Sokabe (Nagoya University / Kanazawa Institute of Technology) Gravitational Responses of Single Cells: A Report from Space
Speaker 3	Soichiro Ueno (IDDK Co., Ltd.) Development of an Automated and Autonomous Experimental System for a Space Experiment Platform —Continuous Imaging of Biological Phenomena Using Lensless Microscopy—
Speaker 4	Jun Hidema (Chiba University) Mitochondrial Dynamics in Arabidopsis Grown in a Microgravity Environment

Symposium 3	
Date	2026/9/19
Symposium Title	Robustness of Life Revealed by Space — From Genome Repair to Reconstruction of the Spinal Nervous System
Organizer	Miho Shimizu (The University of Electro-Communications)
Overview	As human exploration of Mars becomes increasingly realistic, a fundamental question is how life can maintain continuity under the combined extreme conditions of microgravity and high-energy radiation. Co-organized with the Grant-in-Aid for Transformative Research Areas (A), “Life Revealed by Space,” this symposium examines robustness, a fundamental property underlying biological evolution, across multiple levels of organization. Yoshizumi Ishino will discuss genome protection and repair mechanisms in archaea that suppress deleterious mutations while allowing evolutionary diversity. Parag Gad will address neural plasticity and active adaptive capacity from the forefront of locomotor restoration through spinal cord stimulation. In addition, selected general presentations will explore robustness from molecules to whole organisms and consider new horizons for space life science.
Speaker 1 (25 min)	<Invited talk / Online> Dr. Parag Gad (Co-Founder & CEO, SpineX) Reconstructing Neural Function: Translating Spinal Cord Neuromodulation from Adaptive Biology to Clinical Reality

Speaker 2 (25 min)	<Invited talk / On-site> Prof. Yoshizumi Ishino (Professor Emeritus, Kyushu University) DNA Repair Mechanisms in Hyperthermophilic Archaea: Insights from Analyses of the Thermococcales into the Guardians of Early Life on Earth *Discoverer of CRISPR sequences
Speaker 3 (10 min)	Kaori Shigetomi (Associate Professor, Institute for the Advancement of Higher Education, Hokkaido University) Through Therapeutic Calcification
Speaker 4 (10 min)	Akihito Otsuki (Lecturer, Tohoku Medical Megabank Organization, Tohoku University) Construction of an Integrated Biobank for Space Life Science to Facilitate the Use of Data and Biospecimens from Mouse Spaceflight Experiments
Speaker 5 (10 min)	Kunihiko Tanaka (Graduate School of Health and Medicine, Gifu University of Medical Science) Magnetic Vestibular Stimulation Compensates for the Decline in Vestibular Function Induced by Simulated Microgravity

Symposium 4

Date	2026/9/19
Symposium Title	Development and Application of New Technologies for Plant Cultivation in Space Environments
Organizers	Jun Hidema (Chiba University) / Kim Johnson (La Trobe University)
Overview	In 2026, a new Australia–Japan collaborative research program supported by the Australia Japan Innovation Fund, “Developing sustainable agriculture systems for climate challenged environments,” was launched. The program aims to develop efficient and reliable agricultural systems for the lunar surface through joint research. This symposium will introduce the program and feature presentations by researchers from Australia and Japan on new technologies and plant utilization for agriculture in extraterrestrial environments, including the Moon, their potential applications, and future research directions. The session will discuss emerging trends and prospects in space plant science.
Speaker 1	Mathew Lewsey (La Trobe University) Spatial single cell transcriptomics
Speaker 2	Troy Miller (University of Western Australia) Proteomics Reveals How Spaceflight Reshapes Cellular Processes in Lettuce

Speaker 3	Toshiro Kaneko (Graduate School of Engineering, Tohoku University) Air Plasma-Based On-Site Nitrogen Fertilizer Synthesis for Lunar Agriculture
Speaker 4	Mariko Oka (Tottori University) Study on the Cultivation of Sweet Potato as a Calorie Crop Using Lunar Regolith Simulant

<Day 3>

Symposium 5	
Date	20-Sep
Symposium Title	Life Behavior under Microgravity: Unveiling Adaptation to Earth's 1G
Organizers	Atsushi Higashitani (Tohoku University) / Tsuyoshi Kobayashi (Nagoya University)
Overview	By examining responses and adaptive reactions to microgravity at multiple levels of biological organization—from cultured cells to <i>Caenorhabditis elegans</i> and whole organisms—this symposium seeks to explore the biological significance of Earth's 1G environment. Together with participants, we aim to discuss and share new questions and challenges for future space experiments. Speakers include researchers selected from broadly related general presentations (approximately six talks of about 15 minutes each).
Speaker 1	Tsuyoshi Kobayashi (Nagoya University) Gravity Sensing of Cultured Animal Cells
Speaker 2	Masashi Tanimoto (National Institute for Basic Biology) Imaging Tilt Responses in Vertebrate Otolith Organs: Continuous Sensing of Earth's 1G by the Sacculle
Speaker 3	Takahiko Sato (Fujita Health University) A Novel Strategy to Prevent Microgravity-Induced Skeletal Muscle Atrophy through Organelle Contact Modulation
Speaker 4	Atsushi Higashitani (Tohoku University) Lack of Mechanical Tactile Stimulation under Space Microgravity Alters the Nervous System and Accelerates Neuromuscular Aging in <i>Caenorhabditis elegans</i>
Speaker 5	Hironori Bando (Asahikawa Medical University) How Do Parasites Change in Space? Effects of Simulated Microgravity on <i>Toxoplasma gondii</i> Transcriptional State and Infection-State Transitions
Speaker 6	Soya Uetsuki (Dassai Co., Ltd.) Sake Brewing Under Lunar Gravity

Symposium 6	
Date	2026/9/20
Symposium Title	Biological Irradiation Technologies for Space Radiation Research and Their Applications
Organizer	Michiyo Suzuki (Takasaki Institute for Advanced Quantum Science, QST)

Overview	Accurate evaluation and understanding of the effects of space radiation on plants and animals are essential for human spaceflight and space agriculture. At the same time, beginning radiation-irradiation experiments can present a significant barrier for researchers in the biological sciences. This symposium introduces a range of irradiation technologies for biological samples, with the aim of providing an entry point for researchers new to the field. Scientists involved in developing biological irradiation systems and researchers using irradiation facilities for space life science will present the capabilities and appeal of these approaches.
Speaker 1	Tomoo Funayama (Takasaki Institute for Advanced Quantum Science, QST) Heavy-Ion Microbeam Irradiation for Space Radiation Research
Speaker 2	Yusuke Kazama (RIKEN Nishina Center for Accelerator-Based Science) Control of Mutation Induction by Heavy-Ion Beams: Activities at the Biological Irradiation Facility, RIKEN Nishina Center
Speaker 3	Ayako Sakamoto (Takasaki Institute for Advanced Quantum Science, QST) A Wide Range of Options from Low to High Doses: Plant Research Using the Co-60 Irradiation Facility at TIAQ, QST
Speaker 4	Chang Hyun Maeng (Hokkaido University) Radiation Tolerance of <i>Physcomitrium patens</i> Spores for Space Applications

Symposium 7	
Date	2026/9/20
Symposium Title	Life in Space Environments: Possibilities and Exploration Strategies
Organizers	Kensei Kobayashi (Yokohama National University) / Shin-ichi Yokobori (Tokyo University of Pharmacy and Life Sciences)
Overview	This symposium will discuss the possibility of life in space environments and strategies for its exploration. With future exploration missions in mind, we will review and examine methods for detecting life and its traces (biosignatures). Based on current knowledge of the survivability and adaptive mechanisms of terrestrial organisms in space environments, the session will also consider the conditions required for life to exist beyond Earth and the prospects for detecting it.
Speaker 1	Yohey Suzuki (The University of Tokyo) Discovery of a Deep Microbial Ecosystem Isolated in 2-Billion-Year-Old Rocks: Implications for Martian Life Exploration
Speaker 2	Keigo Enya (JAXA) Searching for Life in the Solar System
Speaker 3	Hajime Mita (Fukuoka Institute of Technology) Space Exposure Experiments from “Tanpopo” to “Daisy”
Speaker 4	Hiroshi Kato (Mie University) Evaluation of Cyanobacteria and Fission Yeast Survival in the ISS External Exposure Experiment “Tanpopo”

* Note: English translations of the symposium program were prepared with the assistance of ChatGPT (OpenAI) and reviewed by the Conference Chair.