

Program

Introduction

9:30–9:40	Hiroshi Wada, Project Leader, Tohoku University
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A01: Cell Mechanics

The goal of this study was to understand dynamic phenomena of cellular and tissular structures under the condition of mechanical stimulation at cellular and biomolecular levels.

9:40–10:00	Structural analysis of the motor protein prestin, Hiroshi Wada, Tohoku University
10:00–10:20	Effects of cytoskeletal structures on elastic and viscoelastic properties of cells in soft tissues, Takeo Matsumoto, Nagoya Institute of Technology
10:20–10:40	Biomechanical properties of collagen gel associated with microvessel formation in vitro, Kazuo Tanishita, Keio University
10:40–11:00	Depth-dependent compressive behaviors of articular cartilage and chondrocytes, Teruo Murakami, Kyushu University

A02: Cellular Response to Mechanical Stimulation

From biomechanical viewpoints at micro- and nano-structural levels, we focused on the mechanism of how cells respond to an applied mechanical stimulus, such response leading to changes in cytoskeletal structures and cellular functions.

11:10–11:30	Cytoskeletal reassembling and calcium signaling responses to mechanical perturbation in osteoblastic cells, Taiji Adachi, Kyoto University
11:30–11:50	Experimental estimation of preexisting tension in single actin stress fiber of vascular cells, Masaaki Sato, Tohoku University
11:50–12:10	Biophysical mechanisms of tension-dependent dynamic behavior of actin fibers, Masahiro Sokabe, Nagoya University

Invited Lectures

13:30–14:00	Micro- and nanoscale biomechanics in Taiwan, Fong-Chin Su, National Cheng Kung University
14:00–14:30	Biomechanics research advancement in Singapore, James Cho-Hong Goh, National University of Singapore

A03: Tissue Engineering

We aimed to establish tissue engineering techniques for regenerating living tissues such as bone, cartilage, ligament and blood vessel by controlling culture environments from a physical point of view, and controlling micro-structure of 3D scaffolds.

14:40–15:00	Effects of cyclic hydrostatic pressure loading on regulation of chondrocyte phenotypes, Takashi Ushida, The University of Tokyo
15:00–15:20	Effects of a shear flow and water filtration on the cell layer of a hybrid vascular graft, Takeshi Karino, Hokkaido University
15:20–15:40	Tissue reconstructions for motor organs with mechanically structured grafts, Kazuo Takakuda, Tokyo Medical and Dental University

A04: Computational Biomechanics

The target was to understand the micro- and nano-scale structure modeled and remodeled in the biomechanical environment from the viewpoint of the hierarchy of multi-scale systems and to construct a framework of the computational biomechanics/simulation in conjunction with the informatics of multi-scale biomechanical systems.

15:50–16:10	Microscopic analysis of bone, Masao Tanaka, Osaka University
16:10–16:30	Study on the mechanism of the initiation and the development of the human cerebral and cardiovascular diseases, Takami Yamaguchi, Tohoku University
16:30–16:50	Microstructural mechanism of skeletal muscle injury and a new constitutive model of skeletal muscle, Eiichi Tanaka, Nagoya University
16:50–17:10	Mechanical characteristics of vascular cells and tissues exposed to deformation, freezing, and shock waves: measurements and theoretical predictions, Hiroshi Yamada, Kyushu Institute of Technology