

CONTENTS

Foreword	v
SECTION 1: NANO-BIOMECHANICS	1
Measurement Integrated Simulation to Provide Accurate Information of Blood Flows <i>Toshiyuki Hayase, Kenichi Funamoto</i>	3
Microelastic Mapping by AFM of Endothelial Cells Exposed to Shear Stress <i>Masaaki Sato, Kenichi Suzuki, Yosuke Ueki, Toshiro Ohashi</i>	17
Inner Ear Biomechanics <i>Hiroshi Wada, Michio Murakoshi, Koji Iida, Shun Kumano, Kenji Ishihara</i>	29
Computational Biomechanics for Investigating Cardiovascular Diseases <i>Takami Yamaguchi, Hitoshi Kondo, Yuji Shimogonya, Yohsuke Imai, Noriaki Matsuki, Takuji Ishikawa</i>	41
Change in Mechanical Properties and Activities of Matrix Metalloproteinases in Rat Aortas Stimulated with Cytokines <i>Wenjing Huang, Naoya Sakamoto, Toshiro Ohashi, Masaaki Sato</i>	51
Formulation of Linearized Error Dynamics Equations of Measurement-Integrated Simulation <i>Kentaro Imagawa, Toshiyuki Hayase</i>	57
Evaluation of the Mechanical Properties of Blood Vessel Biomodeling with Poly (Vinyl Alcohol) Hydrogel <i>Hiroyuki Kosukegawa, Keisuke Mamada, Kanju Kuroki, Lei Liu, Kosuke Inoue, Toshiyuki Hayase, Makoto Ohta</i>	63

Numerical Experiment for Ultrasonic-Measurement-Integrated Simulation of Developed Laminar Pipe Flow Using Axisymmetric Model	71
<i>Lei Liu, Kenichi Funamoto, Toshiyuki Hayase</i>	
The Effect of ATP on Force Relaxation of Isolated Actin Stress Fibers Exposed to Step Strain	77
<i>Tsubasa Matsui, Shinji Deguchi, Naoya Sakamoto, Toshiro Ohashi, Masaaki Sato</i>	
Development of an <i>in vitro</i> Tracking System for Catheter Motion	83
<i>Makoto Ohta, Chang-Ho Yu, Hiroyuki Kosukegawa, Keisuke Mamada, Kanju Kuroki, Shinzo Oota, Kazuto Takashima, Kiyoshi Yoshinaka</i>	
Analysis of Changes in the Gliding Direction of Kinesin-Driven Microtubules Focusing on Their Length and Kinesin Density	91
<i>Shukei Sugita</i>	
Remodeling of Vascular Endothelial Cells Induced by Stretching Force Transmitted Through Intercellular Junctions	99
<i>Yosuke Ueki, Naoya Sakamoto, Toshiro Ohashi, Masaaki Sato</i>	
Estimation of Unsteady Blood Flow Rate in Ultrasonic-Measurement-Integrated Simulation	107
<i>Takayuki Yamagata, Toshiyuki Hayase</i>	
SECTION 2: NANO-BIOIMAGING	115
Structural Change of the Human Brain with Aging in Healthy Subjects-A Brain Magnetic Resonance Image (MRI) Study	117
<i>Hiroshi Fukuda, Yasuyuki Taki, Kentaro Inoue, Shigeo Kinomura, Kazunori Sato, Ryoji Goto, Ken Okada, Ryuta Kawashima</i>	
Elasticity-Based Tissue Characterization of Arterial Wall	129
<i>Hideyuki Hasegawa, Kentaro Tsuzuki, Masataka Ichiki, Fumiaki Tezuka, Hiroshi Kanai</i>	
Radiologic Anatomy of the Right Adrenal Vein: Preliminary Experience with MDCT	139
<i>Shoki Takahashi, Kei Takase, Tomonori Matsuura</i>	

Potentials of Nano-Bio-Imaging with Positron Emission Tomography and Radiopharmaceuticals	147
<i>Manabu Tashiro, Kazuhiko Yanai</i>	
High Intensity Focused Ultrasound Treatment Enhanced with Nano- to Micro-Particles	161
<i>Shin-Ichiro Umemura, Shin Yoshizawa, Kazuaki Sasaki, Ken-Ichi Kawabata</i>	
Molecular Imaging and Its Application to Drug Development at Tohoku University	175
<i>Kazuhiko Yanai, Nobuyuki Okamura, Ren Iwata, Manabu Tashiro</i>	
Molecular Imaging of Lymph Node Micrometastasis Using Contrast-Enhanced High-Frequency Ultrasonography	185
<i>Li Li, Kei Takase, Shoki Takahashi</i>	
Evaluation of Exercise Induced Organ Energy Metabolism Using Two Analytical Approaches: A Pet Study	195
<i>Mehedi Masud, Toshihiko Fujimoto, Masayasu Miyake, Shoiichi Watanuki, Masatoshi Itoh, Manabu Tashiro</i>	
Development of a New Positron Emission Mammography (PEM)	201
<i>Masayasu Miyake, Seiichi Yamamoto, Masatoshi Itoh, Kazuaki Kumagai, Takehisa Sasaki, Targino Rodrigues Dos Santos, Manabu Tashiro, Mamoru Baba</i>	
Analysis of Anatomical Networks Using Regional Gray Matter Volume with Japanese Brain MRI Database	207
<i>Kai Wu, Hiroshi Fukuda</i>	
SECTION 3: NANO-BIODEVICES	213
Passive Intelligent Walker Controlled by Servo Breaks	215
<i>Yasuhisa Hirata, Kazuhiro Kosuge</i>	
New Objective Assessment of Acoustic Transfer Function via Patulous Eustachian Tube Using Time-Stretched Pulse	225
<i>Tetsuaki Kawase, Yoko Hori, Yasushi Baba, Toshimitsu Kobayashi, Shuichi Sakamoto, Yôichi Suzuki</i>	

Miniaturized Microfluidic Biofuel Cells <i>Matsuhiko Nishizawa</i>	235
Development of an Endoscopic Tactile Sensor Using PVDF Films <i>Mami Tanaka, Takeshi Okuyama, Mikiko Sone, Yoshikatsu Tanahashi, Seiji Chonan</i>	245
Development of a Fully Implantable Retinal Prosthesis with a Three-Dimensionally Stacked Large-Scale Integrated Circuit <i>Tetsu Tanaka, Takafumi Fukushima, Mitsumasa Koyanagi</i>	255
Visualization of Ion Distribution by a Chemical Imaging Sensor <i>Tatsuo Yoshinobu, Ko-Ichiro Miyamoto, Shin'ichiro Kanoh, Torsten Wagner, Michael J. Schöning</i>	271
A Car Transportation System with Multiple Robots: iCART <i>Mitsuru Endo, Kenji Hirose, Yasuhisa Hirata, Kazuhiro Kosuge, Koki Suzuki, Takashi Kanbayashi</i>	281
A Photoreceptive Stimulator for a Retinal Prosthesis with 3D Stacked LSI <i>Kouji Kiyoyama, Keigo Sato, Yoshiyuki Kaiho, Hiroshi Tomita, Eriko Sugano, Takafumi Fukushima, Hiroyuki Kurino, Tetsu Tanaka, Mitsumasa Koyanagi</i>	289
Development of a Silicon Neural Probe for an Intelligent Silicon Neural Probe System <i>Risato Kobayashi, Lee Sanghoon, Soichiro Kanno, Bea Jicheol, Takafumi Fukushima, Kazuhiro Sakamoto, Norihiro Katayama, Hajime Mushiake, Tetsu Tanaka, Mitsumasa Koyanagi</i>	297
Evoked Potentials in Response to Electrical Stimulation of the Cochlear Nucleus by Means of Multi-Channel Surface Microelectrodes <i>Kiyoshi Oda, Tetsuaki Kawase, Daisuke Yamauchi, Hiroshi Hidaka, Toshimitsu Kobayashi</i>	309
Development of a Tactile Sensor for Evaluation of Detergents <i>Daisuke Tsuchimi, Mami Tanaka</i>	315

SECTION 4: NANO-BIOINTERVENTION	325
Noncontact Manipulation of Micro-Nano Scale Biological Objects in a Chip Using Integrated Optical Tweezers and Microtools <i>Fumihito Arai, Hisataka Maruyama, Toshio Fukuda</i>	327
On-Chip Cell Manipulation with Magnetically Driven Microtools <i>Fumihito Arai, Yoko Yamanishi</i>	333
Analysis of Tumor Suppressor Gene Using Molecular Imaging for Personalized Medicine <i>Natsuko Chiba, Leizhen Wei</i>	339
Development of a Transcutaneous Energy Transmission System for Advanced Medical Applications <i>Kentaro Kato, Kota Shinohe, Tetsuya Takura, Fumihiro Sato, Hidetoshi Matsuki</i>	351
Development of Bio-Imaging with Functional Nano-Objects <i>Noriaki Ohuchi, Masaaki Kawai, Yuu Sakurai, Hideo Higuchi, Yoshio Kobayashi, Kohsuke Gonda, Motohiro Takeda</i>	361
Development of the Various Kinds of Artificial Organs and Clinical Application of the New Diagnosis Tool <i>Tomoyuki Yambe</i>	373
Pulse Diagnosis Machine and Autogenic Training <i>Tomoyuki Yambe</i>	387
Detection Algorithm of Fatal Arrhythmias for Implantable Cardioverter Defibrillators Using Joint Probability <i>Makoto Yoshizawa, Hiroyuki Kinoshita, Kazuo Shimizu, Masashi Inagaki, Kazunori Uemura, Masaru Sugimachi, Kenji Sunagawa</i>	399
Quantitative Evaluation of Effects of Visually Induced Motion Sickness Using Photoplethysmography <i>Makoto Abe, Makoto Yoshizawa, Norihiro Sugita, Akira Tanaka, Shigeru Chiba, Tomoyuki Yambe, Shin-Ichi Nitta</i>	411

Sentinel Lymph Node Biopsy and Mapping by Silica-Coated Fluorescent Beads	421
<i>Liman Cong, Motohiro Takeda, Mika Watanabe, Yoshio Kobayashi, Masaki Kobayashi, Noriaki Ohuchi</i>	
<i>In vivo</i> Real-Time Tracking of Single Particle in Tumors of Mice	427
<i>Yohei Hamanaka, Masaaki Kawai, Kohsuke Gonda, Motohiro Takeda, Noriaki Ohuchi</i>	
Analysis of Power Spectrum and Fractal Dimension During Undulation Pump Ventricular Assistance	433
<i>Hongjian Liu, Yasuyuki Shiraishi, Xiumin Zhang, Yun Luo, Tomoyuki Yambe</i>	
Fabrication of Transparent Arteriole Membrane Models	441
<i>Takuma Nakano, Seiichi Ikeda, Toshio Fukuda, Takehisa Matsuda, Makoto Negoro, Fumihito Arai</i>	
Achievement of Mechanical Assistance by an Artificial Myocardium Using Shape Memory Alloy Fibre	449
<i>Yasuyuki Shiraishi, Tomoyuki Yambe, Dai Homma</i>	
Analysis of BRCA1 Accumulation at DNA Double-Strand Breaks Using a Molecular Imaging Technique	459
<i>Leizhen Wei, Natsuko Chiba</i>	
Author Index	467