

# Contents

## Part I Cell Sort Engineering

<b>1 Cell Mechanical Characterization Based on On-Chip Robotics .....</b>	<b>3</b>
Fumihito Arai and Shinya Sakuma	
<b>2 Dimensionless Evaluation of Cell Deformability with High Resolution Positioning in a Microchannel .....</b>	<b>23</b>
Chia-Hung Dylan Tsai, Shinya Sakuma, Fumihito Arai and Makoto Kaneko	
<b>3 Real-time Capillary-level Microchannel Flow Analysis Using a Full-pixel Frame-straddling Micro-PIV System .....</b>	<b>43</b>
Idaku Ishii and Tadayoshi Aoyama	
<b>4 High-throughput Measurements of Single Cell Rheology by Atomic Force Microscopy .....</b>	<b>57</b>
Kaori Kuribayashi-Shigetomi, Ryosuke Takahashi, Agus Subagyo, Kazuhisa Sueoka and Takaharu Okajima	
<b>5 Discrimination of Cells with Specific Antigens Expressed on a Membrane Based on the Dielectrophoresis .....</b>	<b>69</b>
Tomoyuki Yasukawa and Fumio Mizutani	
<b>6 Analysis of Physical Characteristic of Hematopoietic Cells.....</b>	<b>79</b>
Shoichi Iriguchi, Tomoyuki Yamaguchi and Hiromitsu Nakauchi	

## Part II 3D Cellular System Design

<b>7 Cell Manipulation and Cellular Parts Assembly for Constructing 3D Cellular Systems.....</b>	<b>93</b>
Masaru Kojima, Yasushi Mae, Kenichi Ohara, Mitsuhiro Horade, Kazuto Kamiyama and Tatsuo Arai	

<b>8 High-Throughput Cell Assembly Featuring Heterogeneous Hydrogels Produced by Using Microfluidic Devices.....</b>	<b>129</b>
Masumi Yamada and Minoru Seki	
<b>9 On-Chip Fabrication, Manipulation and Self-Assembly for Three-Dimensional Cell Structures .....</b>	<b>151</b>
Toshio Fukuda, Tao Yue, Masaru Takeuchi and Masahiro Nakajima	
<b>10 Fabrication of 3D Cellular Tissue Utilizing MEMS Technologies.....</b>	<b>177</b>
Shotaro Yoshida, Daniela Serien, Fumiaki Tomoike, Hiroaki Onoe and Shoji Takeuchi	
<b>11 Photofabrication Techniques for 3D Tissue Construct.....</b>	<b>203</b>
Shinji Sugiura, Fumiki Yanagawa and Toshiyuki Kanamori	
<b>12 Cell Detachment for Engineering Three-Dimensional Tissues .....</b>	<b>213</b>
Junko Enomoto, Takahiro Kakegawa, Tatsuya Osaki, Tatsuto Kageyama and Junji Fukuda	
<b>13 Quantitative Evaluation of Cell-Hydrogel Adhesion by Advanced Optical Techniques.....</b>	<b>223</b>
Hiroshi Y. Yoshikawa	
<b>14 Cell Scooper: A Device for the Rapid Transfer of Living Cell Sheet.....</b>	<b>235</b>
Kenjiro Tadakuma, Nobuyuki Tanaka, Yuji Haraguchi, Mitsuru Higashimori, Makoto Kaneko, Tatsuya Shimizu, Masayuki Yamato and Teruo Okano	
<b>Part III Sociocytology</b>	
<b>15 Hydrogel-Based Microenvironment for Modulating Gland Tissue Morphogenesis.....</b>	<b>251</b>
Takuya Matsumoto	
<b>16 Bone Related Cell-Stimulating Scaffold Materials and a 3D Cellular Construct for Hard Tissue Regeneration.....</b>	<b>261</b>
Osamu Suzuki and Takahisa Anada	
<b>17 The Visualization of Human Organogenesis from Stem Cells by Recapitulating Multicellular Interactions .....</b>	<b>275</b>
Ran-Ran Zhang, Hiroyuki Koike and Takanori Takebe	
<b>18 Bionic Simulator Based on Organ-Explant-Chip .....</b>	<b>285</b>
Taisuke Masuda, Hirofumi Owaki, Tomohiro Kawahara and Fumihito Arai	

<b>19</b>	<b>Tempo-Spatial Dynamics of Cellular Mechanics .....</b>	<b>295</b>
	Takeomi Mizutani and Ryosuke Tanaka	
<b>20</b>	<b>Four-Dimensional Analysis for a Tumor Invasion .....</b>	<b>305</b>
	Masato Tamura and Hirofumi Matsui	
<b>21</b>	<b>Three-Dimensional Mineralized Tissue Formation of Cultured Bone Marrow Stromal Cells .....</b>	<b>317</b>
	Takanori Kihara	
<b>22</b>	<b>Sociocytology Illuminated by Reconstructing Functional Tissue with Cell Sheet Based Technology .....</b>	<b>327</b>
	Kazuhiro Fukumori, Hironobu Takahashi, Jun Kobayashi, Masamichi Nakayama, Yoshikatsu Akiyama and Masayuki Yamato	
	<b>Index .....</b>	<b>347</b>

Hyper Bio Assembler for 3D Cellular Systems

Arai, T.; Arai, F.; Yamato, M. (Eds.)

2015, XI, 349 p. 202 illus., 161 illus. in color., Hardcover

ISBN: 978-4-431-55296-3