

Contents

Part I Introduction

- 1 Evolution of Nanotechnology to Intelligent Nanosystem** 3
Jun'ichi Sone

Part II Bio-sensing, Imaging, and Cell Manipulation

- 2 Field-Effect Transistors for Detection of Biomolecular Recognition** 13
Miyuki Tabata, Tatsuro Goda, Akira Matsumoto and Yuji Miyahara
- 3 BioImaging System with High Resolution and Sensitivity for Biological Science and Medical Application** 27
Kazuaki Sawada, Fumihiko Dasai, Koichi Okumura, Masato Futagawa and Toshiaki Hattori
- 4 Development of High-Throughput Screening Device for Neurodegenerative Diseases** 45
Tsuneo Urisu, Zhi-hong Wang, Hidetaka Uno, Yasutaka Nagaoka, Kei Kobayashi, Miho Goto-Saitoh, Yoshinori Suzuki and Yoko Urabe

Part III Micro Fluidics/MEMS and Their Application

- 5 Extended-Nano Scale Fluidics and Applications to Bioanalysis** 65
Hisashi Shimizu, Kazuma Mawatari, Yutaka Kazoe, Yuriy Pihosh and Takehiko Kitamori
- 6 Microfluidic Approach to Cell Handling and Measurement** 85
Jiro Kawada, Shohei Kaneda, Soo Hyeon Kim and Teruo Fujii
- 7 Digital Bioassay with Femtoliter Reactor Array** 107
Takao Ono and Hiroyuki Noji

Part IV Nano-fabrication Using Biotemplate

- 8 Biotemplates and Their Application to Electronic Devices** 119
Yukiharu Uraoka, Mutsunori Uenuma, Yasuaki Ishikawa,
Shinya Kumagai, Satoshi Tomita, Heiji Watanabe
and Ichiro Yamashita
- 9 Fabrication of 3D Quantum Dot Array by Fusion
of Bio-Template and Neutral Beam Etching I: Basic
Technologies** 145
Seiji Samukawa
- 10 Fabrication of 3D Quantum Dot Array by Fusion of Biotemplate
and Neutral Beam Etching II: Application to QD Solar Cells
and Laser/LED** 169
Seiji Samukawa

Part V Fundamental Technologies for Nanosystem Integration

- 11 Development of Novel Nano-systems for Electrochemical Devices
by Hierarchizing Concentrated Polymer Brushes** 195
Yoshinobu Tsujii, Yohei Nakanishi, Ryohei Ishige, Kohji Ohno,
Takashi Morinaga and Takaya Sato
- 12 Metallo-Supramolecular Polymers: Design, Function, and Device
Application.** 217
Masayoshi Higuchi
- 13 Feasibility of Fabricating Large-Area Inorganic Crystalline
Semiconductor Devices** 249
Jitsuo Ohta, Kohei Ueno, Atsushi Kobayashi and Hiroshi Fujioka
- 14 Synthesis of Subnanoparticles Using a Dendrimer Template** 277
Takane Imaoka and Kimihisa Yamamoto
- 15 Electrochemistry-Based Smart Biodevices** 303
Matsuhiko Nishizawa

Part VI New Concepts of Spintronics

- 16 Spin Current Physics and Its Thermoelectric Application** 327
Ken-ichi Uchida and Eiji Saitoh



<http://www.springer.com/978-4-431-56427-0>

Intelligent Nanosystems for Energy, Information and
Biological Technologies

Sone, J.; Tsuji, S. (Eds.)

2016, VIII, 341 p. 216 illus., 168 illus. in color.,

Hardcover

ISBN: 978-4-431-56427-0