

Contents

List of Contributors ix

Part I Pseudo-Peptides, Polyamino Acids, and Polyoxazolines 1

- 1 Characterization of Polypeptides and Polypeptoides – Methods and Challenges 3
David Huesmann and Matthias Barz
- 2 Poly(2-Oxazoline): The Structurally Diverse Biocompatibilizing Polymer 31
Rodolphe Obeid
- 3 Poly(2-Oxazoline) Polymers – Synthesis, Characterization, and Applications in Development of POZ Therapeutics 51
Randall W. Moreadith and Tacey X. Viegas
- 4 Polypeptoid Polymers: Synthesis, Characterization, and Properties 77
Brandon A. Chan, Sunting Xuan, Ang Li, Jessica M. Simpson, Garrett L. Sternhagen, and Donghui Zhang

Part II Advanced Polycondensates 121

- 5 Polyanhydrides: Synthesis and Characterization 123
Rohan Ghadi, Eameema Muntimadugu, Wahid Khan, and Abraham J. Domb
- 6 New Routes to Tailor-Made Polyesters 149
Kazuki Fukushima and Tomoko Fujiwara
- 7 Polyphosphoesters: An Old Biopolymer in a New Light 191
Kristin N. Bauer, Hisaschi T.C. Tee, Evandro M. Alexandrino, and Frederik R. Wurm

Part III Cationically Charged Macromolecules 243

- 8 Design and Synthesis of Amphiphilic Vinyl Copolymers with Antimicrobial Activity 245**

Leanna L. Foster, Masato Mizutani, Yukari Oda, Edmund F. Palermo, and Kenichi Kuroda

- 9 Enhanced Polyethylenimine-Based Delivery of Nucleic Acids 273**

Jeff Sparks, Tooba Anwer, and Khursheed Anwer

- 10 Cationic Graft Copolymers for DNA Engineering 297**

Atsushi Maruyama and Naohiko Shimada

Part IV Biorelated Polymers by Controlled Radical Polymerization 313

- 11 Synthesis of (Bio)degradable Polymers by Controlled/"Living" Radical Polymerization 315**

Shannon R. Woodruff and Nicolay V. Tsarevsky

Part V Polydrugs and Polyprodrugs 355

- 12 Polymerized Drugs – A Novel Approach to Controlled Release Systems 357**

Bahar Demirdirek, Jonathan J. Faig, Ruslan Guliyev, and Kathryn E. Uhrich

- 13 Structural Design and Synthesis of Polymer Prodrugs 391**

Petr Chytil, Libor Kostka, and Tomáš Etrych

Part VI Biocompatibilization of Surfaces 421

- 14 Polymeric Ultrathin Films for Surface Modifications 423**

Henning Menzel

- 15 Surface Functionalization of Biomaterials by Poly(2-oxazoline)s 457**

Giulia Morgese and Edmondo M. Benetti

- 16 Biorelated Polymer Brushes by Surface Initiated Reversible Deactivation Radical Polymerization 487**

Rueben Pfukwa, Lebohang Hlalele, and Bert Klumperman

Part VII Self-Assembled Structures and Formulations 525

- 17 Synthesis of Amphiphilic Invertible Polymers for Biomedical Applications 527**

Ananiy M. Kohut, Ivan O. Hevus, Stanislaw A. Voronov, and Andriy S. Voronov

- 18 Bioadhesive Polymers for Drug Delivery 559**

Eneko Larrañeta and Ryan F. Donnelly

- Index 603**