

Contents

Chapter 1	21st Century Challenges for Biomaterials <i>Larry L. Hench</i>	1
Chapter 2	Stem Cell Technology: Hope or Hype? <i>Larry L. Hench and Julian R. Jones</i>	11
Chapter 3	Bioactive Materials for Gene Control <i>Larry L. Hench</i>	25
Chapter 4	Nanoparticles for Novel Healthcare Therapeutics <i>Sudipta Seal, William Self, James McGinnis and A.S. Karakoti</i>	49
Chapter 5	Glass Microspheres for Cancer Treatment <i>Delbert E. Day</i>	57
Chapter 6	Bioactive Glasses and Angiogenesis <i>Alejandro A. Gorustovich, Luis A. Haro Durand and Aldo R. Boccaccini</i>	65
Chapter 7	Clinical Applications of Bioactive Glasses for Maxillo-Facial Repair <i>Ian Thompson</i>	77

Chapter 8	Clinical Applications of Bioactive Glass-Ceramics <i>Takao Yamamuro</i>	97
Chapter 9	Hierarchical Porous Scaffolds for Bone Regeneration <i>Julian R. Jones</i>	107
Chapter 10	Cartilage Regeneration <i>Adam C. Grochowski and Michael B. Fenn</i>	131
Chapter 11	Hydrogels for Tissue Engineering of Articular Cartilage <i>Javier S. Castro</i>	147
Chapter 12	Total Knee Replacements <i>Jason Wertz</i>	167
Chapter 13	Total Hip Replacement <i>Kim Elshot Alvarez</i>	179
Chapter 14	Bioactive Surfaces for Total Hip Prostheses <i>Takao Yamamuro</i>	193
Chapter 15	Artificial Skin and Wound Dressings <i>Krystle Placencio, Thomas Frank Jefferson, Michael Teran and Michael Fenn</i>	201
Chapter 16	Degenerative Disc Disease in the Lumbar Spine <i>Russell Beal</i>	227
Chapter 17	Shoulder Repair <i>Shane D. Smith</i>	243

Chapter 18	Drug-Eluting Stents: Worth the Risk? <i>Adam Estelle</i>	259
Chapter 19	Treating Aortic Aneurysms <i>Rochellee Manygoats</i>	277
Chapter 20	Abdominal Aortic Aneurysms: Treatment and Repair <i>John Ashton</i>	291
Chapter 21	Heart Valve Stenosis and Surgical Repair: Present and Future <i>Scott Cooper</i>	305
Chapter 22	Prosthetic Vascular Grafts for Treatment of Peripheral Arterial Disease <i>Margo Ellis</i>	321
Chapter 23	Small-Diameter Vascular Grafts <i>Kyle Marr</i>	337
Chapter 24	Spinal Cord Repair: Current Methods and Limitations <i>Julie Lockwood</i>	351
Chapter 25	Spinal Cord Repair for Paraplegics <i>Jeffrey Calhoun</i>	367
Chapter 26	Brain–Machine Interfaces <i>Matthew Goodman</i>	383
Chapter 27	Stem Cell Research for Treatment of Parkinson’s Disease <i>Colleen Young and Michael B. Fenn</i>	403

Chapter 28	Tissue Engineering for Corneal Regeneration <i>Ayyasamy Aruchamy</i>	409
Chapter 29	Development of Lasik: Laser-Assisted <i>In Situ</i> Keratomileusis <i>Raymond Lee</i>	429
Chapter 30	Hearing Devices: Experiencing a World of Sound <i>Savannah Burnside</i>	443
Chapter 31	Glass-Ceramic Dental Restorations <i>Wolfram Höland and Volker M. Rheinberger</i>	457
Chapter 32	Pain-Desensitizing Dental Materials <i>David C. Greenspan</i>	469
Chapter 33	Ethical Considerations in Biomaterials Research and Development <i>Mrinal K. Musiband and Subrata Saha</i>	483
Chapter 34	The Ending <i>Larry L. Hench</i>	493
	<i>Index</i>	501