Record Nr. UNISA996426339403316 **Titolo** Silk biomaterials for tissue engineering and regenerative medicine // edited by S. C. Kundu Pubbl/distr/stampa Cambridge, [England]:,: Woodhead Publishing,, 2014 ©2014 **ISBN** 0-85709-706-7 Descrizione fisica 1 online resource (595 p.) Collana Woodhead Publishing Series in Biomaterials;; Number 74 Disciplina 616.02774 Soggetti Biomedical materials Tissue engineering - Simulation methods Electronic books. Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Nota di bibliografia Includes bibliographical references at the end of each chapters and index. Nota di contenuto Cover; Silk Biomaterials for Tissue Engineering and Regenerative Medicine; Copyright; Contents; Contributor contact details; Woodhead Publishing Series in Biomaterials; Foreword; Historical perspectives; Emerging perspectives; Current perspectives; The Dr Who of nature; Part I Fundamentals, processing and types of silk biomaterials; 1 Introduction to silk biomaterials; 1.1 Introduction; 1.2 General information about silkworms; 1.3 Silk proteins; 1.4 Genetics of silkworms; 1.5 Diseases of silkworms; 1.6 Applications of silks; 1.7 Application of silk protein fibroins 1.8 Application of silk protein sericins 1.9 Conclusion; 1.10 Acknowledgments: 1.11 References: 2 Applications of silk biomaterials in tissue engineering and regenerative medicine; 2.1 Introduction; 2.2 Silk scaffolds in tissue engineering and regenerative medicine; 2.3 Hard tissue engineering; 2.4 Soft tissue engineering; 2.5 Tissue engineering for application in specific organs; 2.6 Conclusion and future trends; 2.7 Acknowledgments; 2.8 References; 3 Processing of Bombyx mori silk for biomedical applications; 3.1 Introduction; 3.2 Modulation of silk biomaterial properties 3.3 Silk fibroin materials and their use in biomedical applications 3.4

Conclusion and future trends; 3.5 References; 4 Silk nanostructures

based on natural and engineered self-assembly; 4.1 Introduction; 4.2 Mechanisms of self-assembly in natural and engineered systems: 4.3 Assembly of natural and recombinant silk proteins: 4.4 Engineering the self-assembly of silk; 4.5 Silk nano-architectures and their applications; 4.6 Self-assembly in conjugation with other (bio) materials; 4.7 Conjugation with natural and synthetic materials; 4.8 Conclusion and future trends: 4.9 References 5 Electrospun silk sericin nanofibers for biomedical applications 5.1 Introduction: 5.2 Application of silk sericin in the biomedical field: 5.3 Electrospinning: 5.4 Silk sericin nanofibers from electrospinning: 5.5 Molecular structure and physical properties; 5.6 Silk sericin/silk fibroin blend nanofibers by electrospinning; 5.7 Conclusion and future trends; 5.8 References: 6 Silk fibroin microfiber and nanofiber scaffolds for tissue engineering and regeneration; 6.1 Introduction; 6.2 Silk fibroin (SF) microfibers for skin and connective tissue regeneration 6.3 Formic acid (FA)-cross-linked 3-D SF microfiberbased nonwovens6. 4 SF microfiber-based carded-needled 3-D nonwovens; 6.5 Nanofibers from electrospinning and tissue engineering; 6.6 Electrospun SF tubes for small calibre blood vessel regeneration; 6.7 References; 6.8 Appendix: abbreviations: 7 Silk powder for regenerative medicine: 7.1 Introduction: 7.2 Silk particle production by the bottom up approach: 7.3 Silk powder production by the top down approach (milling); 7.4 Characterisation of silk powder; 7.5 Applications of silk particles; 7.6 Conclusion: 7.7 References Part II Properties and behaviour of silk biomaterials

Sommario/riassunto

Silk is increasingly being used as a biomaterial for tissue engineering applications, as well as sutures, due to its unique mechanical and chemical properties. Silk Biomaterials for Tissue Engineering and Regenerative Medicine will discuss the properties of silk which make it useful for medical purposes and its applications in this area. Part one will provide an introduction to silk biomaterials, discussing the fundamentals of silk biomaterials, how they are processed and considering different types of silk biomaterials. Part two will focus on the properties and behaviour of s