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Nota di contenuto	Initiating and Facilitating Brain Repair: Factors, Principles, and Mechanisms -- Strategies to Upgrade the Stem Cell Application for Brain Transplantation -- Neural Stem Cell Intervention in Traumatic Brain Injury -- Neurotrophic Factors in Parkinson’s Disease: Clinical Trials -- Emerging Nanotechnology for the Treatment and Diagnosis of Parkinson’s Disease (PD) and Alzheimer’s Disease (AD) -- Poly(Butyl Cyanoacrylate) Nanoparticles deliver -Nerve Growth Factor to the Brain after Traumatic Brain Injury -- The Significance of Biomaterials in Stem Cell-Based Regenerative Medicine -- Endogenous in situ Tissue Regeneration using Inductive Bioscaffolds after Acute Brain Injury -- Alginate Nanofibre Scaffolds for Amyotrophic Lateral Sclerosis -- Developing High-Fidelity in vitro Models of Traumatic Brain Injury to Test Therapeutic Biomaterials -- Challenges and Future Perspectives of

Using Bioactive Scaffolds in Brain Repair.

Sommario/riassunto

This book presents the latest knowledge, trends, and advances in cell transplantation and innovations in developing microspheres, 3D biomaterial constructs to enhance transfer, and cell survival to specific regions of the brain. Neurodegenerative diseases and brain injury are increasing. Medications currently only temporarily reduce some of the symptoms but do not cure or delay progression of the disease. Development of effective treatments dramatically improves the independent living and quality of life of patients. Cell transplantation strategies offer an approach to facilitating brain repair, but efficacy is often limited by low in vivo survival rates of cells that are injected in suspension. Transplanting cells that are attached to or encapsulated within a biomaterial construct has the advantage of maintaining cell-cell and cell-material interactions and improving cell survival in vivo. Biomaterials that have been used in preclinical studies to assist with in vivo cell transfer and survival include heparin-chitosan microspheres, poly(lactic-co-glycolic acid) microspheres, RADA 16 microspheres, poly (desaminotyrosyl tyrosine ethyl ester carbonate) microscale scaffolds, carbon nanotubes, collagen-chitosan scaffolds, poly(L-lactic acid) scaffolds, agarose hydrogels, gelatin methacrylate hydrogels, and agarose micro-columns with an extracellular matrix interior. Incorporating growth factors (e.g., glial-derived neurotrophic factor, neurotrophin 3) into the biomaterial constructs increased cell survival and incorporation into the host tissue. International experts in the fields of both experimental and clinical neurological research contribute chapters to this book and discuss the latest achievements in cell transplantation and matrix-assisted cell transfer/survival technologies for diseases such as Alzheimer’s disease, Parkinson’s disease, and brain injuries such as stroke and traumatic brain injury. It is envisaged that research findings in experimental animal models of Alzheimer’s disease, Parkinson’s disease, traumatic brain injury, and stroke promote clinical trials using biomaterial-assisted transfer of cells.