

1. Record Nr.	UNINA9910960698303321
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Titolo	Extreme Tissue Engineering : Concepts and Strategies for Tissue Fabrication
Pubbl/distr/stampa	Hoboken, : Wiley, 2013
ISBN	9781299132184 1299132189 9781119941057 1119941059 9781119942665 1119942667
Edizione	[1st ed.]
Descrizione fisica	1 online resource (270 p.)
Disciplina	571.538
Soggetti	Cell Culture Techniques Regenerative Medicine - methods Tissue Engineering Tissue Scaffolds Culture Techniques Investigative Techniques Medicine Culture Media Prostheses and Implants Equipment and Supplies Health Occupations Clinical Laboratory Techniques Methods Regenerative Medicine Health & Biological Sciences Biomedical Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.

Extreme Tissue Engineering; Contents; Preface: Extreme Tissue Engineering-a User's Guide; Chapter 1 Which Tissue Engineering Tribe Are You From?; 1.1 Why do we need to engineer tissues at all?; 1.1.1 Will the real tissue engineering and regenerative medicine please stand up?; 1.1.2 Other people's definitions; 1.1.3 Defining our tissue engineering: fixing where we are on the scale-hierarchy; 1.2 Bio-integration as a fundamental component of engineering tissues; 1.2.1 Bio-scientists and physical scientists/engineers: understanding diversity in TERM
1.3 What are the 'tribes' of tissue engineering?1.3.1 Special needs for special characteristics: why is networking essential for TERM?; 1.4 Surprises from tissue engineering (Veselius to Vacanti); 1.5 So, really, is there any difference between tissue engineering and regenerative medicine?; 1.5.1 Questions never really asked: repair versus regeneration?; 1.5.2 Understanding the full spectrum: tissue replacement, repair and regeneration; 1.6 Conclusions; 1.7 Summarizing definitions; Annex 1 Other people's definitions of tissue engineering
Annex 2 Other people's definitions of regenerative medicineFurther reading; Chapter 2 Checking Out the Tissue Groupings and the Small Print; 2.1 Checking the small print: what did we agree to engineer?; 2.2 Identifying special tissue needs, problems and opportunities; 2.3 When is 'aiming high' just 'over the top'?; 2.4 Opportunities, risks and problems; 2.4.1 Experimental model tissues (as distinct from spare-parts and fully regenerated tissues); 2.4.2 The pressing need for 3D model tissues; 2.4.3 Tissue models can be useful spin-offs on the way to implants
2.5 Special needs for model tissues2.5.1 Cell selection: constancy versus correctness; 2.5.2 Support matrices-can synthetics fake it?; 2.5.3 Tissue dimensions: when size does matter!; 2.6 Opportunities and sub-divisions for engineering clinical implant tissues; 2.6.1 Making physiological implants: spare parts or complete replacement?; 2.6.2 Making pathological and aphysiological constructs: inventing new parts and new uses; 2.6.3 Learning to use the plethora of tissue requirements as an opportunity; 2.7 Overall summary; Further reading;
Chapter 3 What Cells 'Hear' When We Say '3D'
3.1 Sensing your environment in three dimensions: seeing the cues3.2 What is this 3D cell culture thing?; 3.3 Is 3D, for cells, more than a stack of 2Ds?; 3.4 On, in and between tissues: what is it like to be a cell?; 3.5 Different forms of cell-space: 2D, 3D, pseudo-3D and 4D cell culture; 3.5.1 What has '3D' ever done for me?; 3.5.2 Introducing extracellular matrix; 3.5.3 Diffusion and mass transport; 3.5.4 Oxygen mass transport and gradients in 3D engineered tissues: scaling Mount Doom; 3.6 Matrix-rich, cell-rich and pseudo-3D cell cultures
3.7 4D cultures-or cultures with a 4th dimension?

Highly Commended at the BMA Book Awards 2013 Extreme Tissue Engineering is an engaging introduction to Tissue Engineering and Regenerative Medicine (TERM), allowing the reader to understand, discern and place into context the mass of scientific, multi-disciplinary data currently flooding the field. It is designed to provide interdisciplinary, ground-up explanations in a digestible, entertaining way, creating a text which is relevant to all students of TERM regardless of their route into the field. Organised into three main sections: chapters 1 to 3 introduce and e