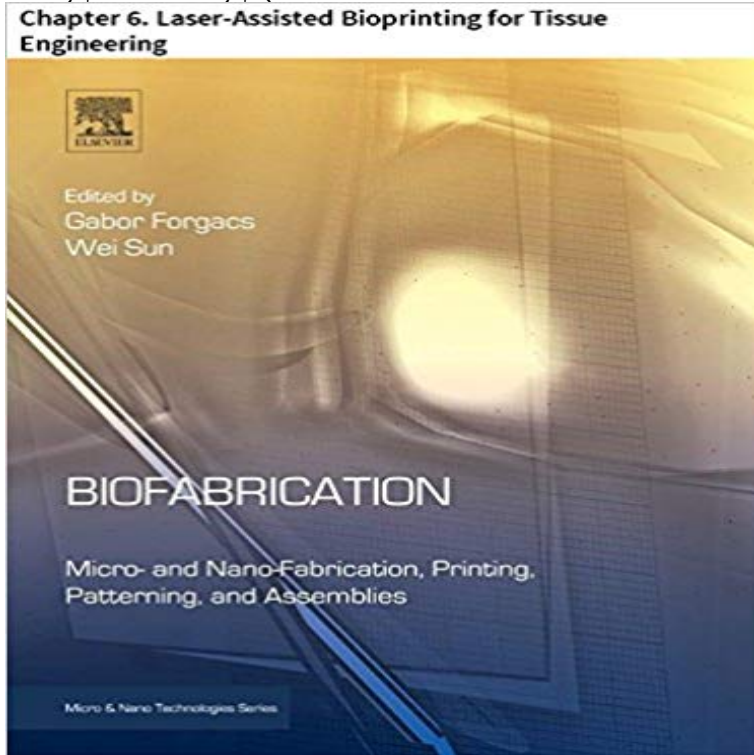


Biofabrication: Chapter 6. Laser-Assisted Bioprinting for Tissue Engineering (Micro and Nano Technologies)



Laser-assisted bioprinting (LAB) is an emerging technology in the field of tissue engineering. Its physical mechanism makes it possible to print cells and liquid materials with a cell-level resolution. By giving tissue engineers control over cell density and organization of 3D tissue constructs, LAB holds much promise for fabricating living tissues with physiological functionality. After introducing the rationale of applying LAB to tissue engineering, we present exhaustively the physical parameters related to the laser-induced forward transfer technique (LIFT), which is implemented in LAB. These parameters are critical to controlling the cell printing process and must work together to print viable cell patterns with respect to cell-level histological organization and to high-throughput manufacturing. After describing the experimental requirements that should be considered to fabricate 3D tissues by LAB, we present some of the main breakthroughs, including multicomponent printing, 3D printing approaches, and bioprinting in vivo that may serve in tissue engineering and regenerative medicine.

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