

Biofabrication for regenerative medicine applications: from acellular instructive scaffolds to bioprinted tissues

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Abstract

The aim of regenerative medicine is to repair a tissue or organ of our body that cannot heal by itself. Typically, this is done by the use of cells, porous materials, and biological factors used either alone or in combination. When porous materials are used, such cellular solids act as a scaffold for cells to be housed and placed in the conditions to thrive to make those proteins that form our tissues. This interplay between cells and scaffolds requires an exquisite control of the design, fabrication, and eventual post-modification of scaffolds (1, 2). In this presentation, I will show through a few examples how processing technologies taking inspiration from the material-forming field can be used to design and fabricate biological constructs with instructive properties. Such biological constructs are able to communicate with cells and persuade them to perform programmed activities towards the regeneration of targeted tissues.

References

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2. Moroni L, de Wijn JR, van Blitterswijk CA. Integrating novel technologies to fabricate smart scaffolds. *J Biomater Sci Polym Ed.* 2008;19(5):543-72.