

## **Biofabrication for regenerative medicine: niche scaffolds for osteochondral regeneration & beyond**

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Organs are complex systems, comprised of different tissues, proteins, and cells, which communicate to orchestrate a myriad of functions in our bodies. Technologies are needed to replicate these structures towards the development of new therapies for tissue and organ repair, as well as for *in vitro* 3D models to better understand the morphogenetic biological processes that drive organogenesis. To construct tissues and organs, biofabrication strategies are being developed to impart spatiotemporal control over cell-cell and cell-extracellular matrix communication, often through control over cell and material deposition and placement. Here, we present some of our most recent advancements in biofabrication that enabled the control of cell activity, moving towards enhanced tissue regeneration as well as the possibility to create more complex 3D *in vitro* models to study biological processes. In particular, we will focus on biofabricated constructs inspired by the bone marrow niche, where different compartments are joined together to direct stem cell quiescence, proliferation, and differentiation towards the osteogenic and chondrogenic lineages.

**Keywords :** *Biofabrication, skeletal regeneration, adult stem cells, stem cell niche*