Engineering of multicellular systems by hydrodynamic waves

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In morphogenesis, ensembles of cells are gently orchestrated and perfectly arranged through chemical gradients, structural anisotropies, and hierarchical compositions.

Traditional approaches in tissue engineering involve the development of physiologically relevant living microenvironments, by combining materials, cells, and biochemical factors to direct the generation of functional tissues.

Over the last few years, the application of extrinsic fields is opening to exciting new perspectives to better control and reproduce the structural complexity of tissue organization toward the *in vitro* engineering of clinically relevant constructs. Within this recent trend, acoustic, magnetic, hydrodynamic fluids, and optical fields have shown time-effective, gentle, and contactless strategies to organize cells, materials, and biochemical factors toward morphogenesis and morphologically relevant tissue fabrication.

In this talk, I will focus on our research activities investigating the use of hydrodynamic waves to biofabricate multi-tissue/organs for regeneration and modelling (1-3).

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