

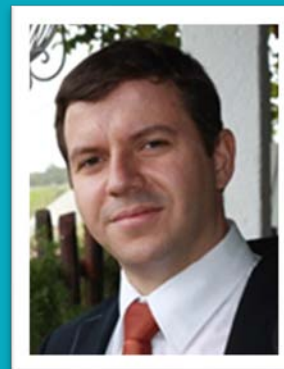
Seminar #7

September 11, 2020, 3:00 pm

Additive manufacturing and bioprinting techniques used for the creation of tissue and organ constructs

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With the advent of computer controlled additive manufacturing (AM) techniques applied to medicine, gradually researchers have adopted and transform these techniques to manufacture three-dimensional (3D) scaffolds for tissue engineering and regenerative medicine^[1]. Gradually these techniques have also started to be largely used to manufacture in vitro models for tissue and organ-like constructs^[2]. The techniques covered during this seminar will span from the traditional electrospinning technique to the more advance direct-writing modalities where nano and micron size fiber can be deposited in a controlled fashion. AM techniques such as fused deposition modeling, selective laser sintering, 3D printing, stereolithography and AM wet-spinning will be explained cover the working principles, the materials commonly used and the applications. Bioprinting techniques will also be showcased, highlighting the main differences to the traditional AM counterparts. The currently applications of bioprinting will be covered largely highlighting the creation of in vitro models. Finally the ultimate ambition of using these techniques to build tissues and organs for patients will be covered highlighting the challenges and the future roadmap.

[1] C. Mota, D. Puppi, F. Chiellini, E. Chiellini. Additive manufacturing techniques for the production of tissue engineering constructs. J Tissue Eng Regen Med, 2015. DOI: <http://doi.org/10.1002/term.1635>

[2] C. Mota, S. Camarero-Espinosa, M.B. Baker, P. Wieringa, L. Moroni. Bioprinting: From Tissue and Organ Development to in Vitro Models. Chem Rev, 2020. DOI: <http://doi.org/10.1021/acs.chemrev.9b00789>



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