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Four-dimensional bio printing: Stimuli-responsive mechanisms for regenerative medicine

Three-dimensional (3D) bio printing emerged as a highly versatile technology able to produce customized structures. The ability to produce those structures in a layer-by-layer fashion allowed a precise control over geometry, morphology and pore interconnectivity. However, those 3D structures may not be the most suitable approach for the clinical requirements. Indeed, four-dimensional (4D) bio printing seems to promise a technology with the ability to induce planned changes at the structures, bridging the gap between the laboratorial constructs and the native human tissues. In summary, 4D bio printing main goal is to develop biological 3D structures, which are suitable to change their properties (e.g. stiffness, shape, volume) when triggered by a pre-defined stimulus (e.g. electricity, ionic force, light, magnetic field, pH and temperature). If on one hand, it is important to develop and design new materials and processes, on the other hand making those materials biocompatible is also crucial. The audience will be dared to think further on the applications of this technology. How will the stimulus be provided? By whom? And on which conditions? Are some of the topics which will be addressed.

Biography

Pedro Moroco is a very enthusiastic and provoking early-career Researcher. Currently, he is the Head of R&D Bio fabrication Group at the Centre for Rapid and Sustainable Product Development – Polytechnic Institute of Leiria, Portugal. He is the Principal Investigator of “2bio4cartilage – Integrated intervention program for prevention and treatment of cartilage lesions”, and his research activity focuses, mostly, on products and processes engineering, aiming to bringing the gap between the lab and in vivo applications. In the last years, he has been invited to collaborate in several national and international projects, he has co-edited books, authored and co-authored more than 200 scientific works, is Member of the Scientific Committees in various conferences, Member of the Advisory Board on TERM for Cambridge Scholars Publishing, and Editorial Member and Reviewer of various journals. He has received two awards in the National Science Communications Contests and representative of Portugal in an international event, Winner of The Publishing Method competition by the American Journal Experts, 2017, was distinguished with the New Investigator Award 2014 and Hans Gros Emerging Researcher Award 2017 from ISBS, Prestigious Award 2017 by the Leiria City-hall and named one of the Personalities for 2017 by the regional press.

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