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3D hydrogels and bio-inks for realistic *in-vitro* modelling and bio-printing

Elia Lopez-Bernardo, Chris Allan and **Rein Ulijn**

Biogelx Ltd, United Kingdom

Abstract

Biogelx have developed innovative biomaterials which offer artificial tissue environments for a range of 3D cell culture and bio-printing applications. The technology platform is based on peptide hydrogels and bio-inks which contain ECM-relevant ligands and are highly tuneable. They are three-dimensional (3D), contain 99% water and have the same Nano scale matrix structure as human tissue. Biogelx biomaterials are non-animal derived and their surface chemistry and mechanical properties can be tuned to meet the needs of any given cell or tissue type. In more detail; these novel hydrogels and bio-inks form a Nano fibrous network mimicking the extracellular matrix, which supports cell function, signalling, and proliferation. Moreover, they have been developed and improved to ensure the rheological properties and are optimal for bio-printing applications. Additionally, they provide great 3D fidelity and do not require the use of support/sacrificial materials or curing agents. These are very versatile materials which offer important benefits for researchers by providing a base modular gel in which the stiffness and surface peptides can be adapted. The uniqueness of these bio-inks is that they offer viscosity control, complete reproducibility, an easy crosslinking method and excellent printability within the same material. The ability to precisely control the hydrogel properties is creating new opportunities in the fields of cancer biology, stem cell research and tissue engineering by offering synthetic-yet-biologically-relevant alternatives to traditional, animal-derived 3D matrices. This presentation will expand on the underlying chemistry of Biogelx's peptide hydrogels, highlighting the range of biochemical/biophysical modifications that can be implemented within the gels, in order to address a wide range of cell-based applications. Some examples of academic and industrial collaborative work shall also be presented, including how the gel tuneable properties can be used to influence the differentiation pathway of stem cells for regenerative medicine applications.

Biography

Elia Lopez-Bernardo manages the Business Development activities at Biogelx combining her experience in product commercialization within the 3D cell culture space with her scientific background. She holds a PhD in Cellular Biology from Universidad Autónoma de Madrid (Spain) and at Biogelx she takes care of Biogelx customers' needs in a wide range of biological applications. She spent two years at Biogelx office in New York, and is now working globally with biotechnology partners and other industry and academic collaborators to help them find the best solutions for their research.

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