BIOGELX MAKING IN VITRO MORE IN VIVO

Biogelx™-INK, Designed To Provide Versatility And Consistency

Biogelx was formed as a spin out company Professor Rein Ulijn's lab at the University of Strathclyde. Biogelx™ self-assembling synthetic peptide products have rapidly gained a global reputation in the area of 3D cell culture for both Regenerative Medicines and Drug Discovery. The materials' unique ability to emulate specific physical properties of a wide range of different tissue types offer new opportunities for the development of tailored 3D models for biomedical and pharmaceutical applications.

Building on the success of Biogelx™ core technology, the company designed and developed a novel bioink product family (Biogelx™-INKs) which opens the opportunity for the development of advanced three-dimensional tissue models. These hydrogel-based inks are biocompatible and easily printable, exhibiting excellent shear-thinning properties, which reduce the stress experienced by cells when subjected to the printing process. However, the key differentiator of these bioinks is the unique mix of their properties, which ensure versatility and consistency for bioprinting applications.

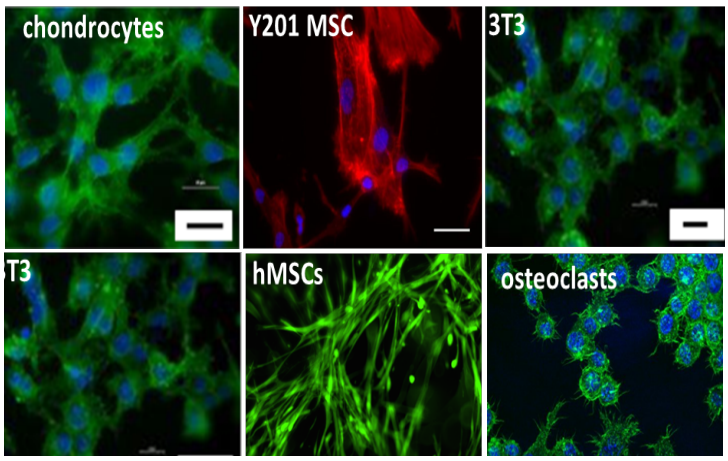
Validate printing profile utilising Bioglex™ standard bioink.

Biogelx™ know how is based on a two-peptide system: a hydrophobic 'gelator' peptide (Fmoc-diphenylalanine), and a hydrophilic 'surfactant' (Fmoc-serine). The peptides self-assemble to form fibres in aqueous environments. In the presence of Ca^{2+} ions, these nanofibers cross-link to form the hydrogel. The result is a nanofibrous network with a similar nanoscale matrix structure to that of the native extracellular matrix (ECM) in human tissue. Due to the dynamic fibrous nature of the materials the porosity is not fixed, the materials can reorganise, and cells can migrate through by displacing fibres. By changing the concentration of the gel, the network properties can be altered which effectively controls the average porosity and stiffness of the gel.

The product offering is provided as lyophilised powder allowing users to simply formulate gels of different stiffness and rigidity that can emulate specific physical properties of a wide range of different tissue types.

The beauty of this simple peptide technology is that both the mechanical and chemical properties of the hydrogels can be independently adjusted to provide an optimal environment for the culture of a variety of cell types. The "surfactant" functionality of the peptide fibres can be modified to incorporate various biomimetic peptide sequences from key extracellular matrix proteins such as fibronectin (RGD), laminin (IKVAV and YIGSR) and collagen (GOFGER), thereby encouraging better cell-matrix interactions to provide an optimal environment for the culture. This feature makes Biogelx™ products eminently suitable for developing 3D cell-based assays to model disease-driven microenvironmental changes delivering greater better precision in drug discovery and to serve as an optimal scaffold for regenerative medicine applications. No other biomaterial offers the versatility to mechanically and chemically tune the matrix scaffold to match ECM both reliably and consistently for specific 3D cell culture applications.

Researchers all over the world have been using Biogelx™ cell culture scaffolds with fibroblasts, human liver cancer (HepG2), pulmonary adenocarcinoma (A549), human colon cancer (HCT116, HCT119), human MSCs, and breast cancer (MCF-7) cell lines, amongst others.



Choose the hydrogel that specifically supports your cell culture type.

biogelx

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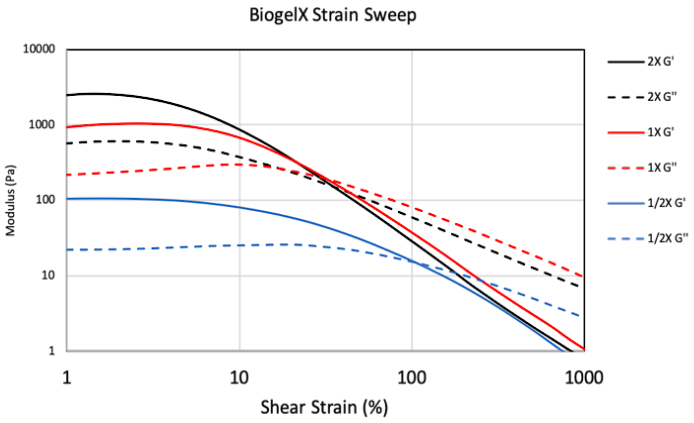
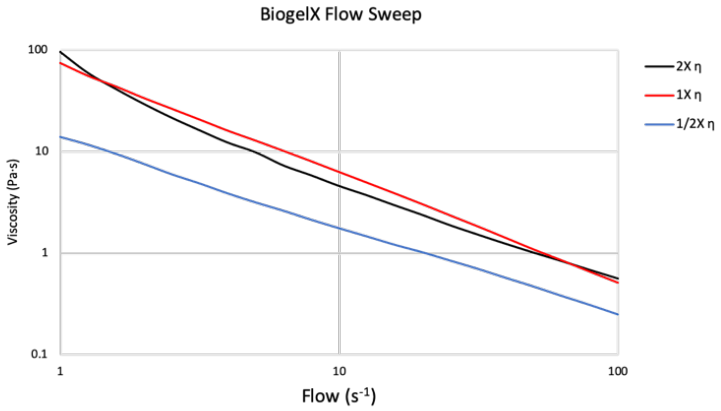
Biogelx's new generation bioink hydrogel scaffolds' have rheological properties that have been optimized for bioprinting applications and can be printed with great fidelity to provide a self-supporting 3D scaffold. Furthermore, these products print without the need for temperature or pH adjustment, UV curing, or addition of reactive cross-linking reagents, all of which can be detrimental to the health of cells. The gelation is simply triggered by the addition of cell culture media; thus, users have complete control of the process. Biogelx™-INKs have been designed to work easily and accurately with both extrusion-based and ink-jet printers to produce high-quality and reliable prints. The controllable physical properties of these products, together with the biocompatibility of the peptide building blocks guarantees both cell viability and printability. Biogelx™-INKs are very easy-to-handle. They are provided as a lyophilized peptide powder and a Biogelx™-PREP solution, which is used to prepare the final bioink formulation. Thanks to this easy-to-use format these bioink powders are stable for one year providing customers with no waste. Preparation of the bioink is very straightforward. Simply take the Biogelx™-INK, mix the powder with the preparation solution at room temperature, store the pre-gel solution at 4^0C overnight, add Ca^{2+} containing cell culture media, incubate the bioink for 2 hours at 37^0C and then start printing. The gelation is triggered by the addition of cell culture media. There is no need for extreme temperature, pH adjustment, UV curing, or addition of reactive cross-linking reagents. The inks were developed and optimized for extrusion-based printing; however, rheology demonstrates flexibility at differing concentrations to generate inks of varying viscosity for use with other printing formats.



Consistency is a major issue with naturally derived biomaterials routinely used in biomedical research. Biogelx™ products contain no animal-derived materials. Instead they are composed of biologically relevant peptides, which are synthetically prepared and thus display consistent physical properties during manufacture.



This reproducibility, along with strict in-process control and QC analysis guarantees batch to batch consistency to provide a versatile and reproducible platform for the development of 3D cell culture models for development of drug discovery assays, development of ATMPs and many other 3D cell culture applications. The fact that Biogelx™-INK products are completely synthetic and contain no ingredients of animal origin, also eliminates any concerns of the presence of adventitious agents.

Biogelx™-INKs are available in standard *(Biogelx™-INK-S)* and functionalized *(Biogelx™-INK-RGD and Biogelx™-INK-GFOGER)* formulations. Try each of the bioinks to identify which ink is best for your specific cell lines.

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