(OP 165) Injectable Gellan Gum Hydrogels as Supports for Cartilage Tissue Engineering Applications

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Gellan gum is an extracellular microbial polysaccharide from Sphingomonas paucimobilis that forms a firm and transparent gel in the presence of metallic ions. This hydrogel presents some interesting features that allow its use as a cell encapsulating support, or as an *in vivo* injectable system. In this work, the usefulness of gellan gum hydrogels as supports for cartilage tissue engineering applications was shown. Processing versatility of gellan gum into different structures such as discs, fibers, membranes, particles, and 3D porous structures using temperature and pH based technologies was demonstrated. The characterization of these structures was conducted using rheological analysis, dynamic mechanical analysis, transmission electron microscopy and cytotoxicity assessment. *In vitro* tests with human articular chondrocytes were conducted during a 8 weeks period. The histological characterization of the tissue engineered constructs was performed using different stainings for cartilage extracellular matrix (ECM) components. At the molecular level, real time PCR was used to quantify the expression of cartilage ECM markers such as col I, col II, aggrecan and Sox9. The *in vivo* performance of the developed structures was investigated in mice. The properties of the materials revealed that gellan gum is adequate to be used as a cell encapsulation support or as an injectable system. The *in vitro* results showed that the typical cartilage ECM components, col II and aggrecan, were being expressed throughout the culturing periods. The *in vivo* results obtained so far are rather promising envisaging the use of gellan gum hydrogels in the cartilage tissue engineering field.