

IMPLEMENTATION OF CHITOSAN BASED HYDROGEL FOR CARTILAGE REPAIR

S A Behruz Khaghani

University of Bradford, UK

Cartilage disease and injury are major health issues: osteoarthritis alone afflicts approximately 8.5 million people in UK. Regardless the magnitude of the problem, though, clinical success has been limited partly due to the fact that the mechanical conditions of the tissue *in vivo* do not provide a favourable environment for the regeneration of new cartilage in the defective site. Consequently, an integer mechanical and biochemical environment should be inserted on the diseased area to stimulate the growth of the tissue. This could be achieved via the use of a thermosensitive hydrogel that could gel by a change in temperature, thus giving the possibility of producing the hydrogel under injection, which is a minimal invasive administration. The present study concentrated on the development and dynamic characterization of a novel hydrogel composed of chitosan and β -glycerophosphate (β -GP) for the replacement and repair of diseased articular cartilage. The gelling parameters of the composition were optimized towards improving the hydrogel's viscosity, while the mechanical properties were evaluated in terms of rheology (viscosity flow curves and flow behaviour), sensitivity to temperature changes, storage and loss moduli via the use of Anton Paar Physica MCR 301 and TA Instruments DSC Q2000.

s.khaghani@bradford.ac.uk