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Mimicking *In Vivo* Tissue Microenvironment for *In Vitro* Testing – Hydrogels for Cell Encapsulation

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Cell-encapsulating hydrogels must be obtained in rigorous and completely cytocompatible conditions, offering this way tissue engineered products that mimic the *in vivo* microenvironment. These hydrophilic structures bring *in vitro* testing to a new level of complexity by offering a tissue-like architecture. Various polymeric structures have been studied in the aim to build hydrogels with physical and mechanical integrity as cell-supporting medium. In this study, collagen-based hydrogels crosslinked with oxidized polysaccharides (chitosan and hyaluronic acid) were used for encapsulating two different types of cells, primary *Albino rabbit* fibroblasts and human epidermoid carcinoma A-431 cells. The cells were able to proliferate into hydrogels and maintained their viability for at least eight days, for both cell lines and initiate tumor formation in the case of A-431 cells. It was observed a better cell integration into oxidized hyaluronic acid crosslinked hydrogels which allowed cell-cell interactions and the formation of spheroids.