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Paper Title: Assessment of Alveolar Bone Cell Sheet Compatibility on Protein-Modified Alginate Membranes

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Abstract

Cell sheet technology has shown a great promise in various applications including the repair of damaged tissues, wound healing, organ repair, and tissue regeneration. It is particularly useful in situations where a precise and organized cell structure is needed for therapeutic purposes. Herein, the potential clinical application of alveolar bone cells is an important goal in tissue engineering and regenerative soft/hard tissues. In this study, human alveolar bone cells were chosen and used by culturing on the alginate membranes. The main components were alginate, agarose, gelatin, and glycerol. Additionally, bovine serum albumin (BSA) and glycine were used to modify the surface of the membranes by coating procedure for 15 minutes. LIVE/DEAD™ stained images perfectly demonstrated adhesion, proliferation, and compatibility of the human alveolar bone cells (3 days incubation), especially the BSA-coated membrane. Furthermore, cell culture kit-8 (CCK-8) assay confirmed the cell viability and proliferation rate on the BSA-coated membrane at approximately ~2 times comparing with the initial timepoint. SEM images also identified the spreading and growing of the human alveolar bone cells on the modified membranes. Thus, we believe that using the modified membrane with BSA holds promise for potential cell sheet applications, in particularly human alveolar bone cells.
