

Publication

A low percentage of autologous serum can replace bovine serum to engineer human nasal cartilage

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For the generation of cell-based therapeutic products, it would be preferable to avoid the use of animal-derived components. Our study thus aimed at investigating the possibility to replace foetal bovine serum (FBS) with autologous serum (AS) for the engineering of cartilage grafts using expanded human nasal chondrocytes (HNC). HNC isolated from 7 donors were expanded in medium containing 10 concentrations (2 serum-free medium or in Hyaff (R)-11 meshes using medium containing FBS or AS. Tissue forming capacity was assessed histologically (Safranin O), immunohistochemically (type II collagen) and biochemically (glycosaminoglycans - GAG- and DNA). Differences among experimental groups were assessed by Mann Whitney tests. HNC expanded under the different serum conditions proliferated at comparable rates and generated cartilaginous pellets with similar histological appearance and amounts of GAG. Tissues generated by HNC from different donors cultured in Hyaff (R)-11 had variable quality, but the accumulated GAG amounts were comparable among the different serum conditions. Staining intensity for collagen type II was consistent with GAG deposition. Among the different serum conditions tested, the use of 2 in the lowest variability in the GAG contents of generated tissues. In conclusion, a low percentage of AS can replace FBS both during the expansion and differentiation of HNC and reduce the variability in the quality of the resulting engineered cartilage tissues.

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