

Abstract

Cocultivation of two (or more) cell types *in vitro* leading to the formation of functioning bone tissue, later inserted into the damaged area, could be a solution for patients for whom the current methods (e.g. use of human bone grafts) are insufficient. In coculture, one cell type is used to accomplish osteogenesis, while the other is used for angiogenesis, because the limit of diffusion of O₂ and essential nutrients is only 200 µm, which means that establishing a vascular network *in vitro* should prevent the new bone tissue from dying after implantation. Creation and understanding of a functioning coculture *in vitro* are crucial for developing a coculture successful *in vivo*.

This work summarises and compares information about the influence of *in vitro* cocultivation on proliferation, osteogenesis and angiogenesis in coculture which uses osteoblasts (or osteoprogenitors), bone marrow mesenchymal stem cells (BMSC) or adipose derived mesenchymal stem cells (ADSC) as it's osteogenic cell type combined with various endothelial cell types. In order to understand the impact of cocultivation on these processes, one chapter deals with interactions between cocultured cell types.

Keywords

coculture, osteogenesis, angiogenesis, *in vitro*, osteoblasts, BMSC, ADSC