**Adhesion of adipose-derived mesenchymal stem cells to patterned protein-glycosaminoglycan surfaces**

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Proteins and glycosaminoglycans (GAGs) are the main constituents of the extracellular matrix (ECM). Until very recently, GAGs were considered as pure structural components while proteins have been associated with crucial cell signalling processes. Nowadays, it is well accepted that these two ECM components act in synergism and are equally critical for the development, growth, function or survival of an organism. In this work, we have developed surfaces that display these two classes of biomacromolecules in spatially controlled fashion. Sulfated GAGs and hyaluronic acid were covalently bound to amino functionalised surfaces and proteins were patterned by micro-contact printing on top of the GAGs. Among proteins, we have selected albumin as a small non-adhesive molecule and fibronectin as a larger, adhesive protein which also has heparin-binding domains. Adipose-derived stem cells (ADSC) were studied in contact with those surfaces. We found that ADSC adhere on the glycan pattern when albumin was used as a model protein and the adhesion and cellular morphology do not depend on the immobilised GAG. Moreover, the cells were positive for CD44. When fibronectin was used instead, the cells were found on the protein pattern where they form large cytoskeleton with well structured actin fibers. We did not found CD44 positive cells for those surfaces.