

## **P34**

### **Phenotypic And Functional Comparison Of Mesenchymal Stem Cells Derived From Bone Marrow And Adipose Tissue**

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#### **Objectives:**

The identification of a suitable cell type with a phenotype and function similar to that of a valve interstitial cell is crucial for a successful tissue engineered heart valve. Previously we demonstrated that human bone marrow mesenchymal stem cells (MSCs) expressed a similar profile of membrane, cytoskeletal and extracellular matrix components as valve interstitial cells. Here we compare MSCs isolated from adipose tissue with those isolated from bone marrow in order to determine their suitability for tissue engineering heart valves.

#### **Method:**

All MSC isolates were characterised by immunocytochemistry or flow cytometry using a panel of inclusion (CD29, CD44, CD73, CD105, fibroblast surface antigen), exclusion (CD14, CD34, CD45, CD31, vWF) and other markers. In addition the capacity of MSCs to secrete and process collagen in response to mechanical force was determined by stretching the cells at 14% for 3 days using a Flexercell FX4000 apparatus and measuring the incorporation of [3H]-proline.

#### **Results:**

Expression of phenotypic markers by bone marrow and adipose tissue MSCs was similar. Stretch increased the incorporation of [3H]-proline in bone marrow MSCs (n=3) by 234±23% and in adipose tissue MSCs (n=4) by 240±43% (mean±st.dev.).

#### **Conclusions:**

The data suggest that MSCs derived from adipose tissue are phenotypically and functionally similar to MSCs derived from bone marrow and would be suitable candidates for tissue engineering applications.