Adipogenic Potential of Adipose-Derived Stromal Cell Subpopulations Enriched For Bone Morphogenetic Protein Receptor IA

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Objective

- Adipose-derived Stromal Cells (ASCs) have been shown to assist fat grafts—“Cell-Assisted Lipotransfer” (CAL)
- Can a subpopulation of ASCs, sorted for Bone Morphogenetic Protein Receptor Type IA (BMPR-IA), demonstrate enhanced adipogenesis for potential use in CAL?
Methods

- Sort fresh ASCs for BMPR-IA using magnetic-activated cell sorting (MACS)
- Treat sorted ASCs with adipogenic differentiation medium
- Assess for lipid formation with Oil Red-O
- Assess gene expression with qRT-PCR
- Assess cell viability when sorted ASCs are co-cultured with adipocytes
**In Vitro Results, ORO Staining**

- BMPR-IA+
- BMPR-IA-
- Unsorted
**In Vitro Results, qRT-PCR**

Adipogenic Gene Expression After 7 Days of Adipogenic Differentiation

- **Expression Normalized to B-Actin**

- **FABP4**
  - BMPR-IA+
  - BMPR-IA-
  - Unsorted

- **LPL**
  - BMPR-IA+
  - BMPR-IA-
  - Unsorted

- **PPARG**
  - BMPR-IA+
  - BMPR-IA-
  - Unsorted

*denotes statistically significant difference (p<0.05) compared to BMPR-IA- and Unsorted ASCs
**In Vitro** Results, qRT-PCR

Angiogenic Growth Factor Expression, % Change After 7 Days of Adipogenic Differentiation

*denotes statistically significant difference (p<0.05) among groups
**In Vitro Results, XTT Assay**

**Co-Culture of ASC's and Mature Adipocytes**

- BMPR-IA+ with Adipocytes
- BMPR-IA- with Adipocytes
- Adipocytes only

* Denotes statistically significant difference (p<0.05) compared to BMPR-IA- and control
Conclusions

- Subpopulations of ASCs with enhanced adipogenesis can be identified and sorted for
- Potential clinical use: Cell-Assisted Lipotransfer performed with adipogenic and/or angiogenic ASC subpopulations