



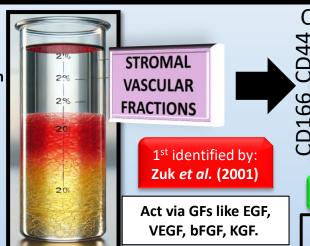


Fat to Function: Adipose Tissue in Dental Pulp Regeneration



Adipose tissue isolation

- Animal: Omentum, Inguinal fat pad, Epididymis, Abdominal fat, Subcutaneous scapular/ Interscapular sites.
- Human: Liposuction aspirates, Infrapatellar or Buccal fat pad.
- Commercial cell lines: 3T3-L1, OP9, T37i.



CD54 CD73 CD90 CD105
PPGD 991GD

Adipose Derived Stem Cell

CELL SURFACE MARKERS

Scaffolds

- PLGA
- Gelfoam
- Amniotic membrane
- Bovine bone
- Hydroxyapatite/β-TCP
- BMP-2
- PRF/PRP
- Semaphorin-A

DENTAL PULP

PDL,
CEMENTUM

BONE

BONE

Adipose Tissue-derived Microvascular Fragments (Ad-MVFs)

Contain endothelial cells, pericytes, and mesenchymal stem cells.

Ad-MVFs maintain the morphologic and functional characteristics of small vessels.

Autologous Ad-MVFs are available for the majority of patients.

PROS: 100–500 times more stem cells than bone marrow, No risk of HLA mismatch if autologous, Less invasive extraction, Immunomodulatory & Anti-inflammatory. **CONS:** Fewer *in-vivo* studies, Lack of standardized procedure for extraction.

- 1) Xu X, Liang C, Gao X, Huang H, Xing X, Tang Q et al. Adipose tissue-derived microvascular fragments as vascularization units for dental pulp regeneration. J Endod. 2021;47(7):1092-100.
- 2) Gaur S, Agnihotri R. Application of adipose tissue stem cells in regenerative dentistry: a systematic review. J Int Soc Prev Communit Dent. 2021;11(3):266-71.
- 3) Yaylaci S, Kacaroglu D, Hurkal O, Ulasli M. An enzyme-free technique enables the isolation of a large number of adipose-derived stem cells at the bedside. Sci Rep. 2023;13(1):80-95.