



Stem Cells from Dental Tissue

The presence of stem cells in dental tissue was first reported in the year 2000 by Songtao Shi during his time as a researcher at the National Institute of Health. Since that time there have been thousands of peer reviewed publications by top quality researchers around the world that have studied these cells. These thousands of papers all overwhelmingly support the usefulness of these cells as a human therapeutic approach for the treatment of disease. These cells are found in high abundance, are not controversial, are safe and have tremendous potential for regenerative medicine. The FDA has not approved stem cells from teeth for therapy yet but those treatments are on the horizon.

Here are just a few of the many review articles that represent of hundreds of other peer reviewed papers all of which support the usefulness of stem cells from teeth for the treatment of disease in regenerative medicine.

Dental stem cells--characteristics and potential.

Bojic S, Volarevic V, Ljujic B, Stojkovic M.

Histol Histopathol. 2014 Jun;29(6):699-706. Epub 2014 Jan 21. Review.

<http://www.ncbi.nlm.nih.gov/pubmed/24446280>

Imperative role of dental pulp stem cells in regenerative therapies: a systematic review.

Kabir R, Gupta M, Aggarwal A, Sharma D, Sarin A, Kola MZ.

Niger J Surg. 2014 Jan;20(1):1-8. doi: 10.4103/1117-6806.127092. Review.

<http://www.ncbi.nlm.nih.gov/pubmed/24665194>

Mesenchymal stem cells derived from dental tissues vs. those from other sources: their biology and role in regenerative medicine.

Huang GT, Gronthos S, Shi S.

J Dent Res. 2009 Sep;88(9):792-806. doi: 10.1177/0022034509340867. Review.

<http://www.ncbi.nlm.nih.gov/pubmed/19767575>

Can SHED or DPSCs be used to repair/regenerate non-dental tissues? A systematic review of in vivo studies.

Daltoé FP, Mendonça PP, Mantesso A, Deboni MC.

Braz Oral Res. 2014 Jan-Feb;28(1). pii: S1806-83242014000100401. Epub 2014 Aug 21.

Review.

<http://www.ncbi.nlm.nih.gov/pubmed/25166769>



Stem cells of the dental pulp.

Ranganathan K, Lakshminarayanan V.

Indian J Dent Res. 2012 Jul-Aug;23(4):558. doi: 10.4103/0970-9290.104977. Review.

<http://www.ncbi.nlm.nih.gov/pubmed/23257502>

A novel method for banking dental pulp stem cells.

Gioventù S, Andriolo G, Bonino F, Frasca S, Lazzari L, Montelatici E, Santoro F, Rebullà P.

Transfus Apher Sci. 2012 Oct;47(2):199-206. doi: 10.1016/j.transci.2012.06.005. Epub 2012 Jul 11. Review.

<http://www.ncbi.nlm.nih.gov/pubmed/22795998>

Osteoblastic/cementoblastic and neural differentiation of dental stem cells and their applications to tissue engineering and regenerative medicine.

Kim BC, Bae H, Kwon IK, Lee EJ, Park JH, Khademhosseini A, Hwang YS.

Tissue Eng Part B Rev. 2012 Jun;18(3):235-44. doi: 10.1089/ten.TEB.2011.0642. Epub 2012 Mar 6. Review.

<http://www.ncbi.nlm.nih.gov/pubmed/22224548>

Biological approaches toward dental pulp regeneration by tissue engineering.

Sun HH, Jin T, Yu Q, Chen FM.

J Tissue Eng Regen Med. 2011 Apr;5(4):e1-16. doi: 10.1002/term.369. Epub 2010 Dec 30. Review

<http://www.ncbi.nlm.nih.gov/pubmed/21413154>

Neural crest stem cells: discovery, properties and potential for therapy.

Achilleos A, Trainor PA.

Cell Res. 2012 Feb;22(2):288-304. doi: 10.1038/cr.2012.11. Epub 2012 Jan 10. Review.

<http://www.ncbi.nlm.nih.gov/pubmed/22231630>

Stem cells in dental pulp of deciduous teeth.

Kerkis I, Caplan AI.

Tissue Eng Part B Rev. 2012 Apr;18(2):129-38. doi: 10.1089/ten.TEB.2011.0327. Epub 2011 Dec 28. Review.

<http://www.ncbi.nlm.nih.gov/pubmed/22032258>



Dental pulp stem cells have been used in human patients to treat disease

Human mandible bone defect repair by the grafting of dental pulp stem/progenitor cells and collagen sponge biocomplexes.

d'Aquino R, De Rosa A, Lanza V, Tirino V, Laino L, Graziano A, Desiderio V, Laino G, Papaccio G.

Eur Cell Mater. 2009 Nov 12;18:75-83. PMID: 19908196

<http://www.ncbi.nlm.nih.gov/pubmed/19908196>

Three years after transplants in human mandibles, histological and in-line holotomography revealed that stem cells regenerated a compact rather than a spongy bone: biological and clinical implications.

Giuliani A, Manescu A, Langer M, Rustichelli F, Desiderio V, Paino F, De Rosa A, Laino L, d'Aquino R, Tirino V, Papaccio G. "Three years after transplants in human mandibles, histological and in-line holotomography revealed that stem cells regenerate a compact rather than a spongy bone: biological and clinical implications." *Stem Cells Transl Med* (2013). PMID: 23502599

<http://www.ncbi.nlm.nih.gov/pubmed/23502599>

Dental pulp stem cells have been shown to have great potential in the following to regenerate tissue and treat disease

- Bone Regeneration
- Chronic Wounds
- Cornea
- Fat (reconstructive plastic surgery)
- Muscle
- Nerve
- Teeth
- Diabetes (Type 1)
- Myocardial Infarction (Heart Attack)
- Parkinson's Disease
- Ischemia/Angiogenesis/Vasculogenesis
- Liver
- Kidney
- Retina



- Pancreases
- Dental pulp
- Autoimmune Disease

Clinical Trials using MSC's from dental tissue.

- <https://clinicaltrials.gov/ct2/show/NCT01814436> . The trial is in China however it is being done by Dr. Shi who was the researcher that discovered stem cells in teeth and currently resides in California.
- <https://clinicaltrials.gov/ct2/show/NCT01932164>
- <https://clinicaltrials.gov/ct2/show/NCT02209311>
- <https://clinicaltrials.gov/ct2/show/NCT00221130> . This one does not specifically say where they got the stem cells from however I believe it was teeth. It is being conducted at Nagoya University where Ueda is head of the department and a pioneer in SHED cells.

This one is using MSC's from bone marrow however it is being conducted by Dr. Robey who is head of N and co-author with Dr. Shi who discovered stem cells in teeth. This study is to establish a baseline to compare dental stem cells.

(<https://clinicaltrials.gov/ct2/show/NCT01557543>)

There are 534 clinical trials with MSC's from other sources at present listed on the FDA's website (www.clinicaltrials.gov).