Stem Cells in Chronic Pain

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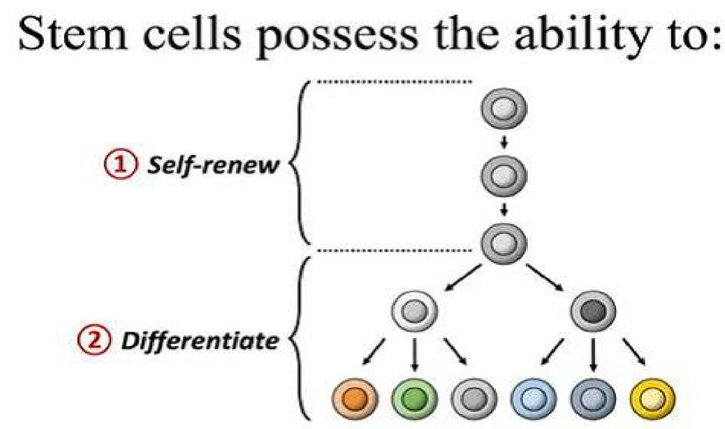
INTRODUCTION

Stemcells are categorized as embryonic stem cells (ESCs), induced pluripotent stem cells (iPSCs) and adult stem cells. Mesenchymal stem cells (MSCs) are adult stem cells which can be isolated from human and animal sources.Adult Stemcells replace the powerful embryonic stemcells as the embryo matures. Dsc's are derived from Dental pulp, periodontal ligament and apical papilla

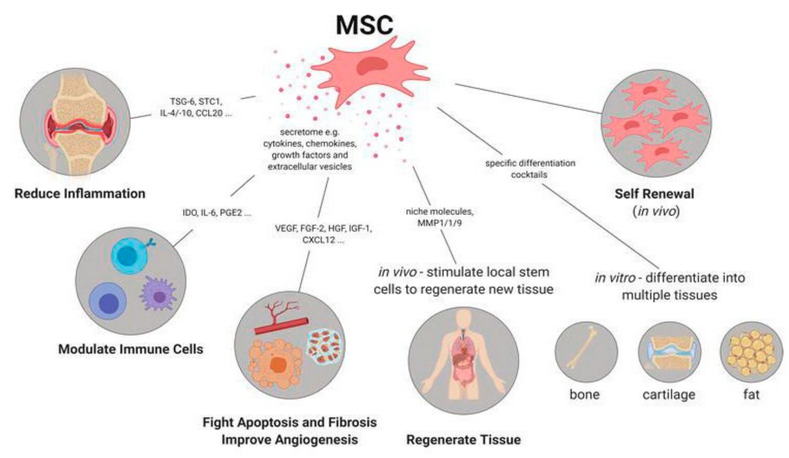
INTRODUCTION



STEM CELL CLASSIFICATION

CLASS	CELL TYPE	MATURE CELL LINEAGES
Totipotent	Embryonic stem cells (ESC) E.g: Zygotes	Differentiated into any cell types
Pluripotent	ESC,IPSC	Differentiated into cell forms any of the 3 germ layers
Multipotent	Adult stem cells E.g: Mesenchymal, Hematopoietic	Into limited range of cell types
Oligopotent	Adult stem cells E.g: Lymphoid, Myeloid	Into a limited number of cell types
Unipotent	Adult stem cells E.g: Sate!ite, Epidermal	Into a single cell type

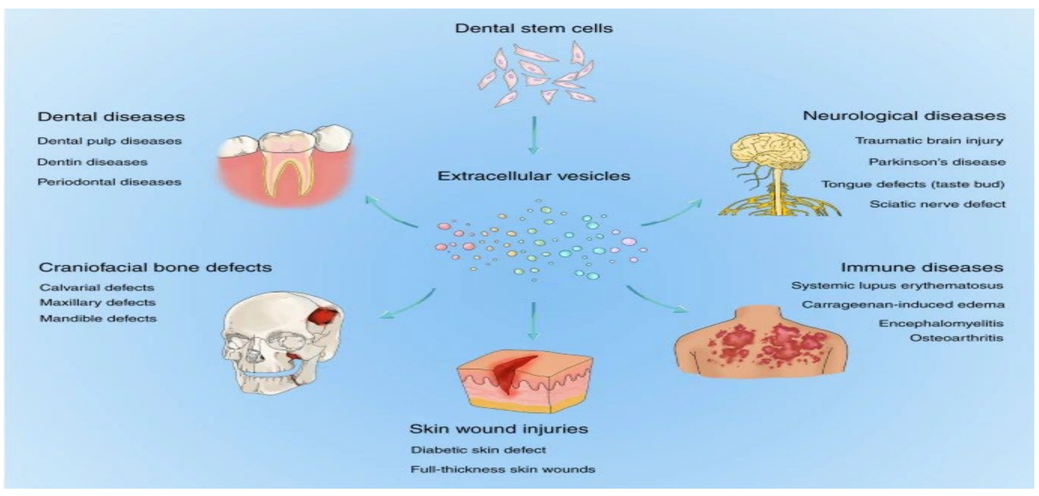
STEM CELL CLASSIFICATION



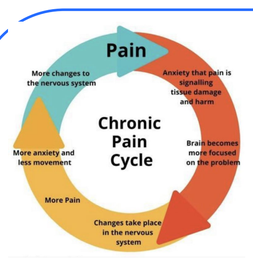
STEM CELL THERAPY BY DENTAL STEM CELLS

Mechanism underlying the therapeutic actions remains elusive. Early studies indicate that DSCs functioned through cell differentiation after being targeted into injury site, Emerging studies have revealed that the low engraftment of transplanted DSCs challenged their established dogma. The contribution of DSCs to treatment is increasingly ascribed to an indirect paracrine manner. By secreting a broad spectrum of secretomes, Dscs can modulate the action of recent cells locally and distantly

STEM CELL THERAPY BY DENTAL STE CELLS



STEMCELLS IN TREATMENT OF CHRONIC PAIN

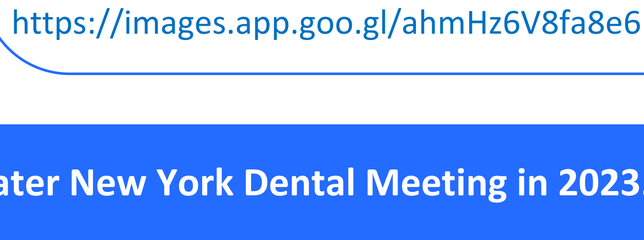


Regeneration of damaged tissue : Stem cells have ability to differentiate into various types of cells including those that make up damaged tissues. Useful for treating injuries or degenerative diseases where tissue damaged or loss is involved. For example in wound healing by inducing the fibroblasts, in joint tissue damage, this is can be differentiated into cartilage cells.

Release of anti-inflammatory factor : Chronic pain is often associated with inflammation, which can exacerbate pain.

STEMCELLS IN TREATMENT OF CHRONIC PAIN

SCs secrete anti-inflammatory factors, including cytokines and growth factor, that can help to reduce inflammation and alleviate pain. E.g, MSCs - Anti-inflammatory cytokines such as interleukin-10 and transforming growth factor-beta.



Modulation of immune response

Induction of nerve regeneration

CONCLUSION

Stem cell therapy is an emerging field with potential applications: Temporomandibular disorder and Trigeminal neuralgia, In the treatment of chronic pain. Stem cells have the potential to regenerate damaged nerve tissue, reduce inflammation and modulate the immune system, all of which can contribute to pain relief. (POSSIBLE MECHANISM: reduce inflammation, modulation, immune system). Research in this area is still in the early stages, there have been promising results from preclinical and clinical studies investigating in the use of various types of stem cells in chronic pain. However, more research is needed to fully understand the safety and efficacy of stem cell therapy. Including the optimal sources of stem cells, best delivery methods and long-456term safety of therapy, Ethics, lack of delivery methods, efficacy.

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