

Commonly Used Orthopaedic Clinical Therapeutics Affect the Cytokine Activity of Culture-Expanded Mesenchymal Stem Cells

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Disclosures

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Non-Operative Osteoarthritis (OA) Management

Weight loss, physical therapy, NSAIDs

Injectable therapeutics

- Hyaluronic acid (HA)
- Platelet-rich plasma (PRP)
- Methylprednisolone (MP)

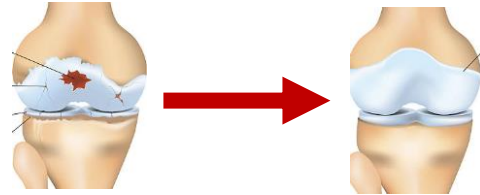
Do not reverse OA progression



Stem Cell Therapy

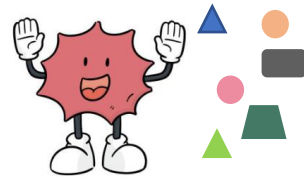
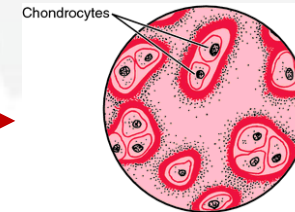
Human bone marrow derived mesenchymal stem cells (BM-MSCs) may be able to restore articular cartilage

- Reverse OA



Work via two mechanisms:

1. Differentiation into chondrocytes
2. Production of cytokines



Cartilage



Clinical Question

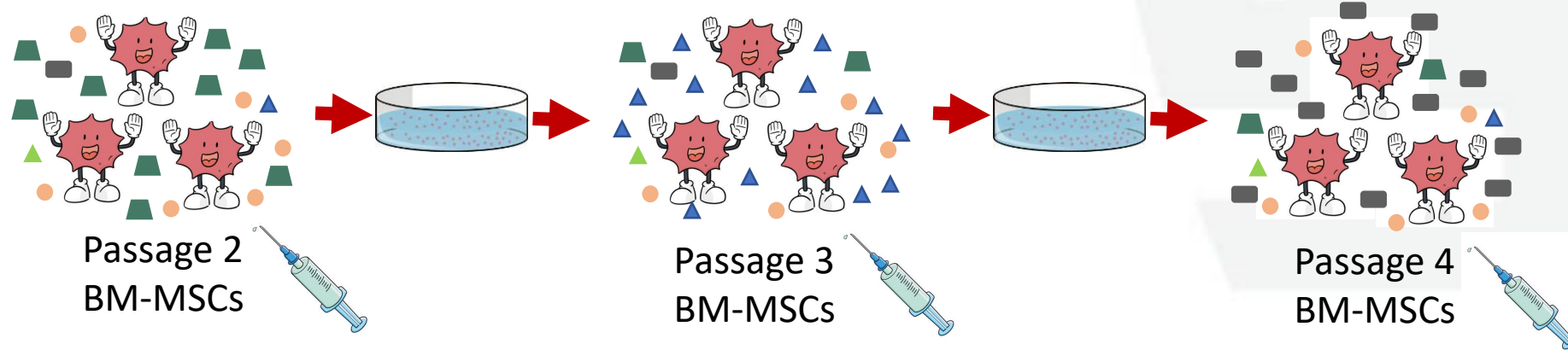
Do HA, PRP, and MP affect the cytokine profile of BM-MSCs?



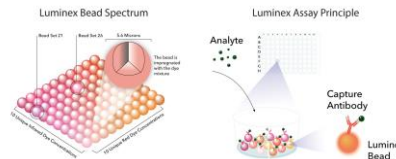
Methods

BM-MSCs grown from passage 2 → passage 4

Levels of OA related cytokines were evaluated 24 hours after exposure to HA, PRP, or MP



Luminex multiplex assays used to measure cytokine levels



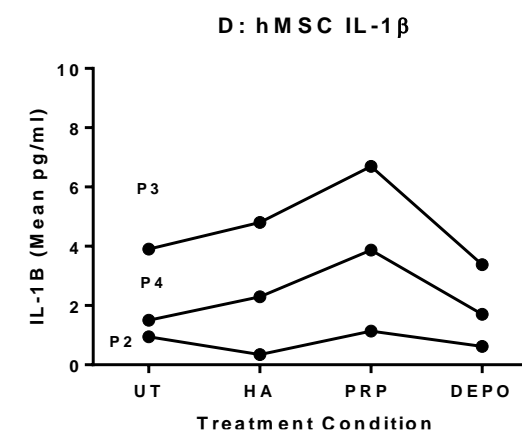
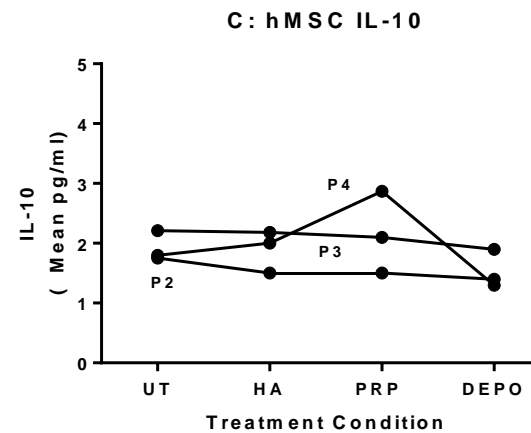
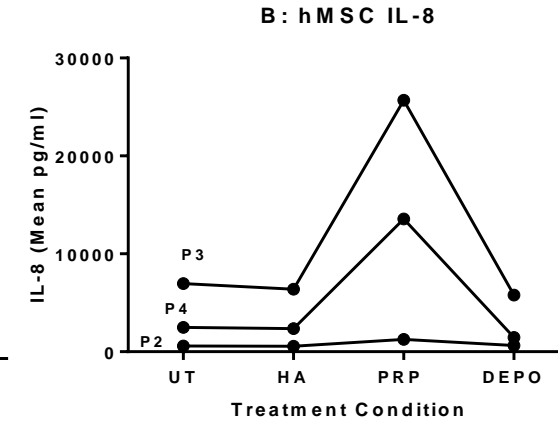
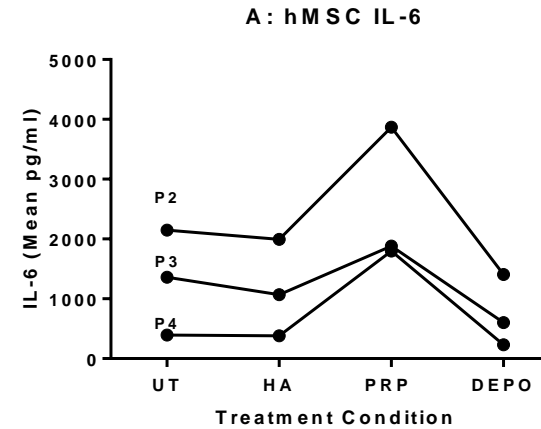
Results

HA reduced BM-MSC expression of SCF, SDF- α , VEGF, CCL20, and adiponectin ($p < .05$)

PRP did not affect IL-10, but increased the following:

- IL-1 levels in P2 and P3
- IL-6 in P2
- IL-8 in P3

MP did not affect cytokine expression ($p > .05$)



Conclusion

Orthopaedic adjuvants influence the inflammatory cytokine profile of BM-MSCs at multiple stages of culture expansion



These therapeutics may be used with BM-MSCs to create an optimal cytokine environment for OA treatment

Thank You

