

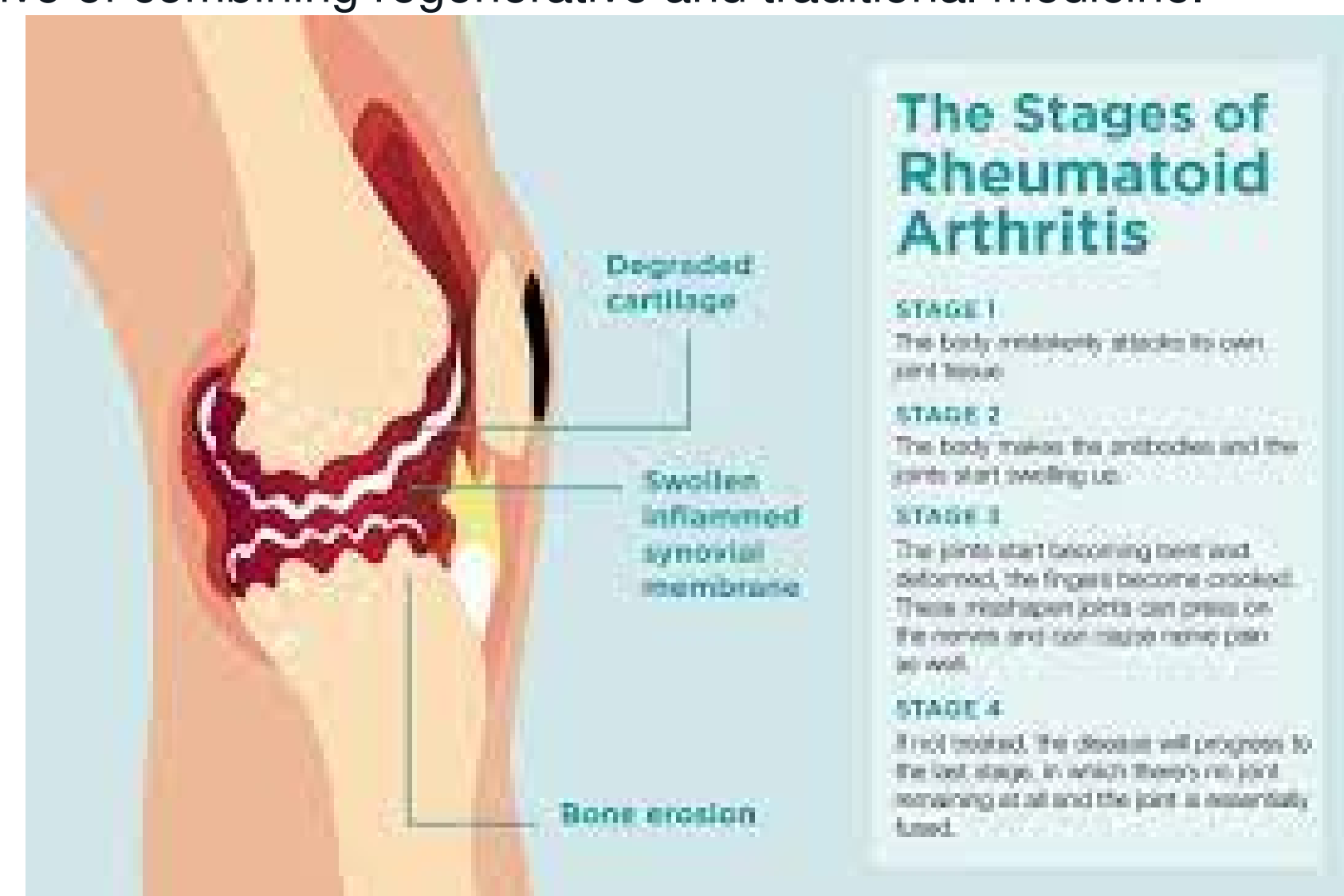
POSSIBLE CURE FOR RHEUMATOID ARTHRITIS: TRADITIONAL AND REGENERATIVE MEDICINE

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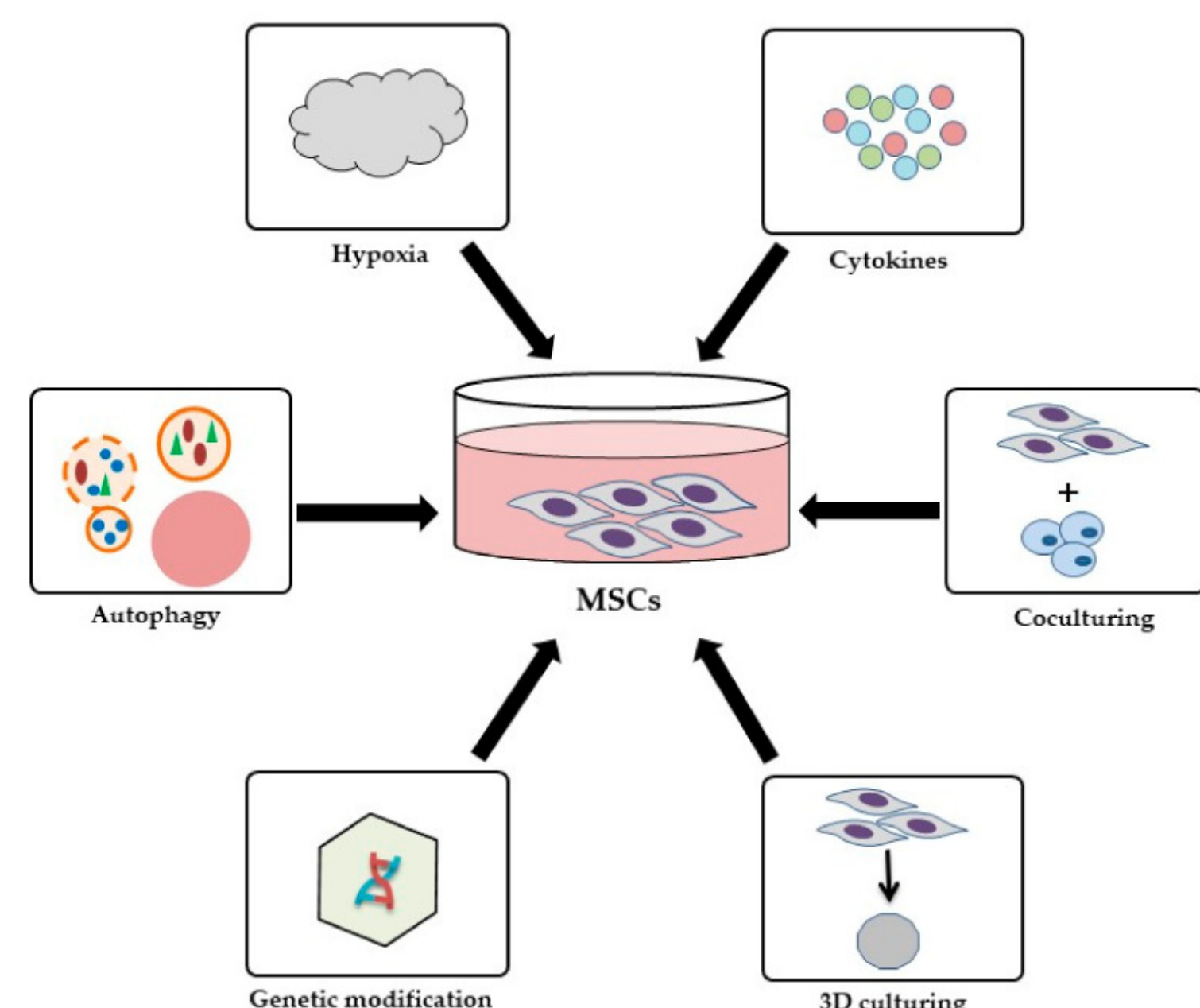
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Abstract

Rheumatoid arthritis (RA) is a chronic inflammatory disorder that is categorized as an autoimmune disease. Autoimmune diseases cause the body to attack its own immune system. In RA patients, this causes systemic inflammation throughout the body which, long term, can cause bone erosion and joint deformity. Immunosuppressants, such as Rituxan (IV) and methotrexate (oral), treat autoimmune diseases by decreasing the body's immune response, therefore, causing other side effects such as susceptibility to other infections and diseases. Stem cell therapy, though controversial, is a regenerative alternative that is conducted with the patient's own tissue. This alternative treatment is still undergoing study due to the risk of tumor formation. The primary goal is to propose a treatment that would maintain remission in patients and trigger a regenerative response through the use of stem cell therapy. To achieve this goal, the paper proposes combining traditional and regenerative treatments in order to simultaneously ease the current flare up, while promoting growth and sustainability to prevent future bone erosion and joint deformity. An additional goal is to assign a marker toward cartilage via infusion in order to avoid tumor risks and successfully attack the degenerative tissues in the body to prevent irreversible damage. Ultimately, this is a unique perspective of combining regenerative and traditional medicine.

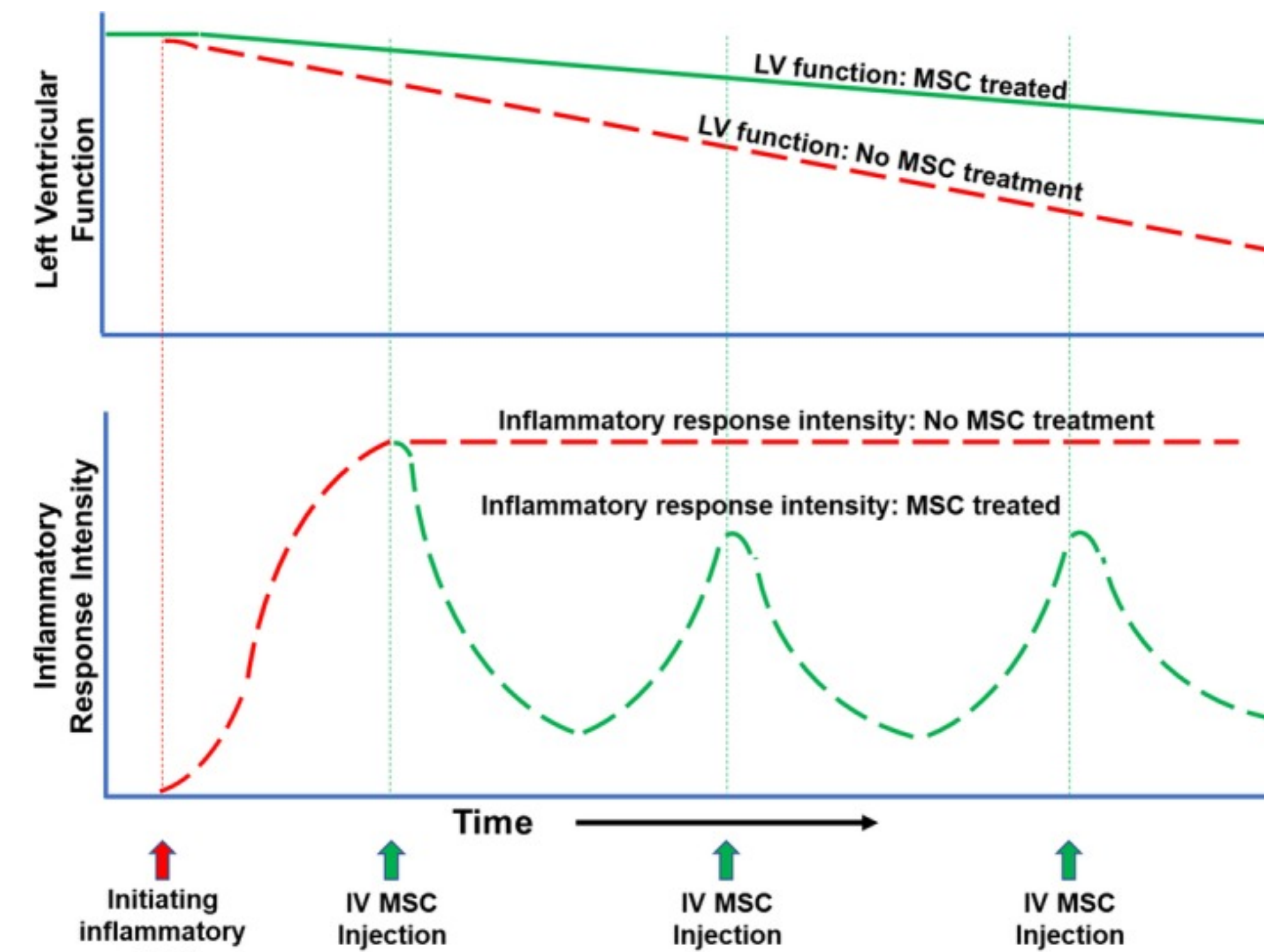


Mesenchymal Stem Cells and RA: Enhance Immunomodulatory and Anti-Inflammatory Properties



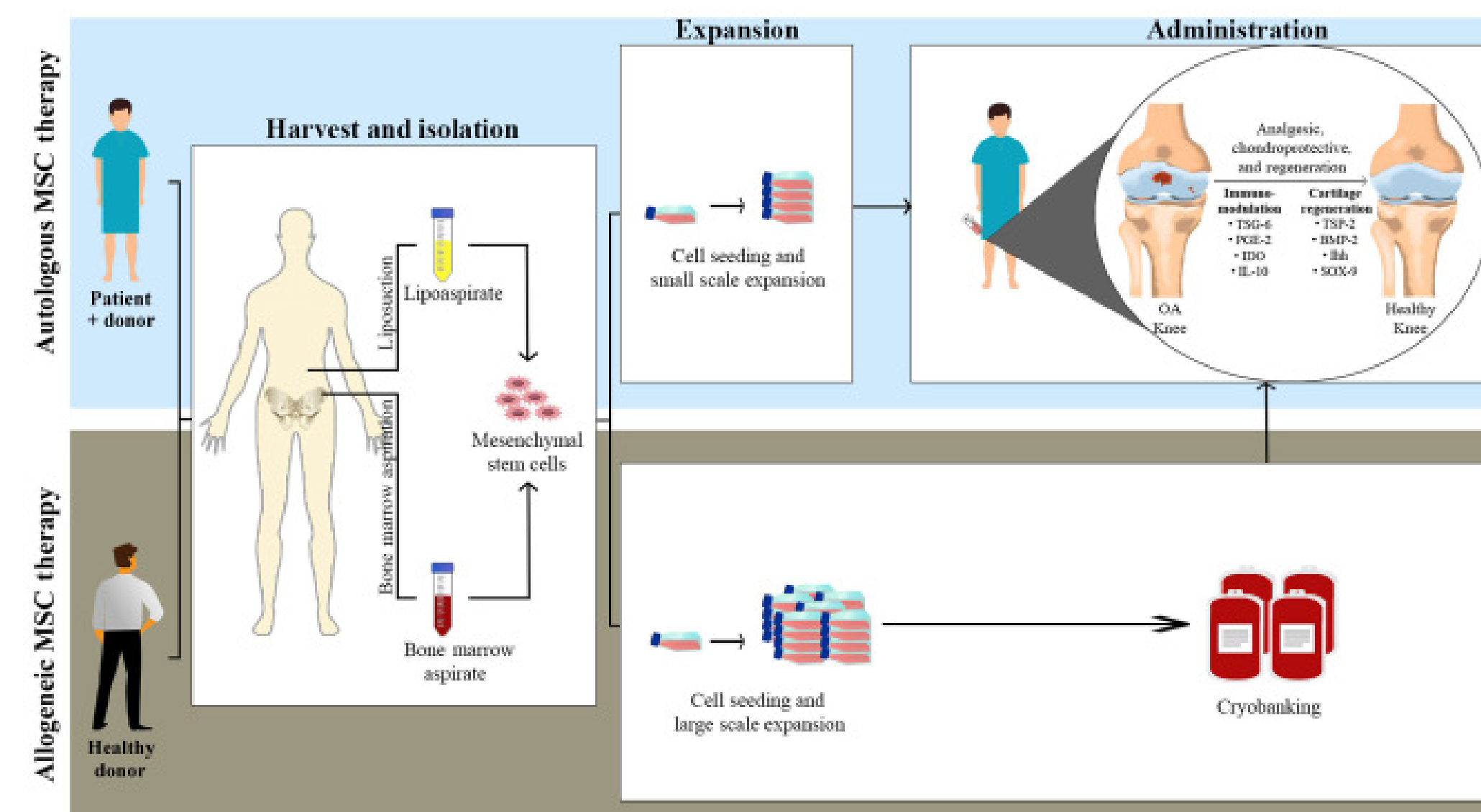
Different approaches to enhance immunomodulatory and anti-inflammatory properties of MSCs in RA.

Similar Case Study with Mesenchymal Stem Cells: Cardiovascular



- Persistent inflammation progresses myocardial dysfunction occurring in patients with acute myocardial infarction and with heart failure.
- MSCs' systemic anti-inflammatory properties are crucial, and can be accomplished through intravenous delivery, allowing for repeated and safe administration of MSCs at a low cost.
- The inflammation is not "cured" by a single injection of stem cells, repetition of injections is necessary.

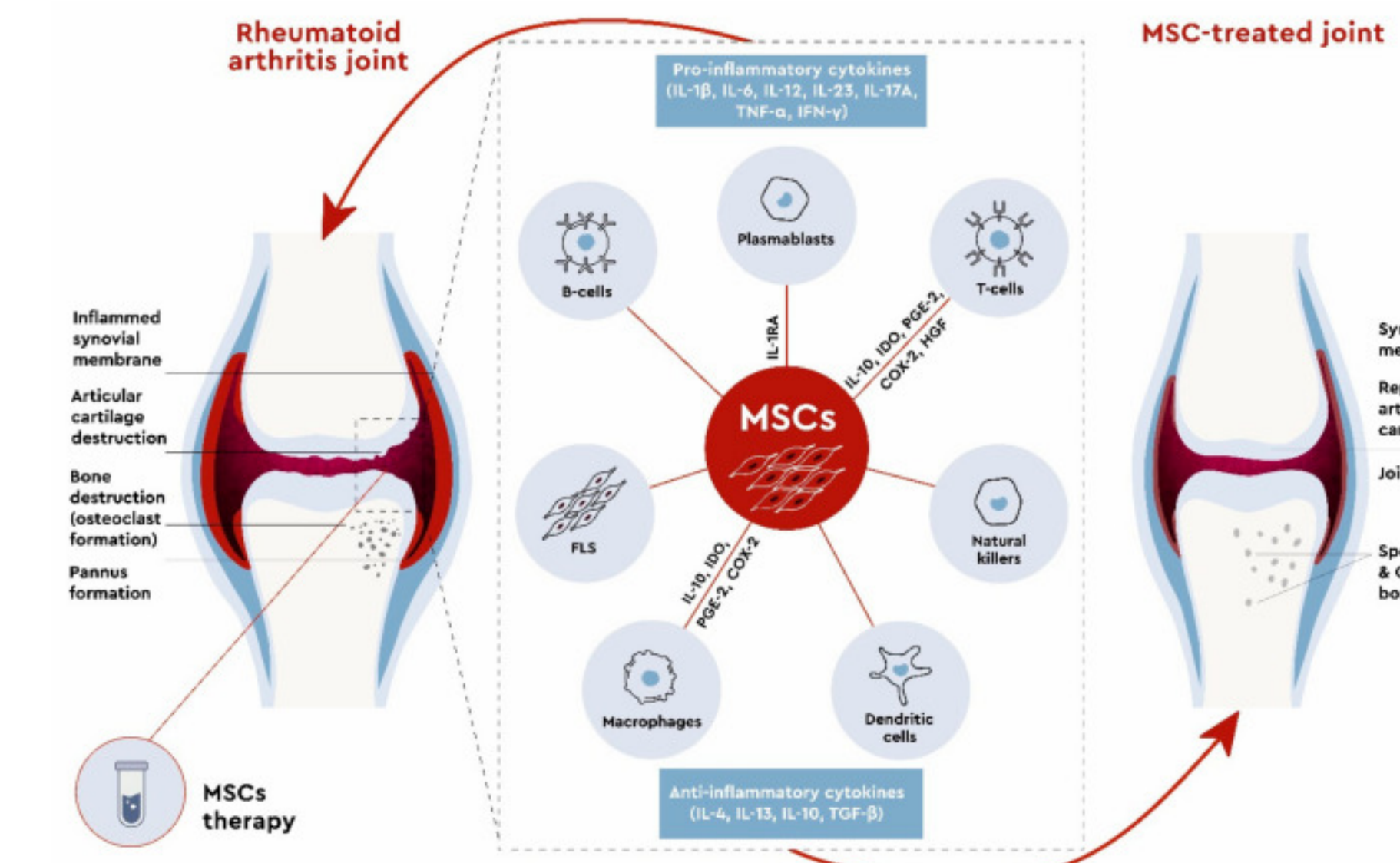
Methodology



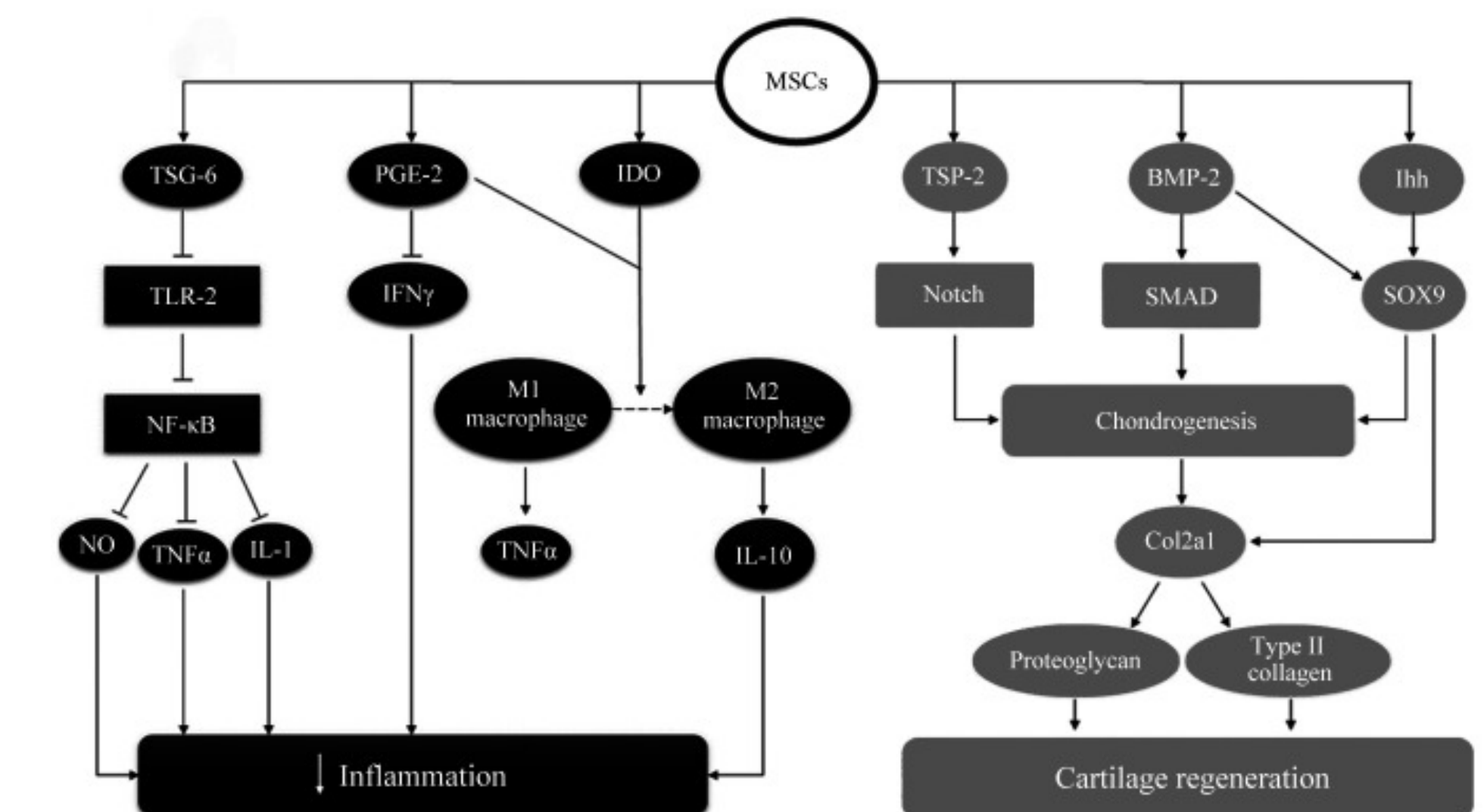
Here are the following steps to our stem cell infusion procedure...

- Harvest Cells
- Send to lab for culture
- Growth Factors
- Administration

Immunomodulatory Effects of MSCs and their Secreted Factors in RA



General Procedures in using BMSCs and ASCs for the Treatment of Osteoarthritis



- Solid lines indicate stimulation, dashed arrows indicate differentiation, arrow heads indicate inhibition.
- Inflammation: Our MSCs will stimulate TSG-6, PGE-2, and IDO proteins, which will then inhibit the necessary proteins to decrease inflammation over time.
- Cartilage: Our MSCs will stimulate TSP-2, BMP-2, and Ihh proteins, which will inhibit the necessary proteins to promote cartilage regeneration.

Aknowledgments:

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 Sarsenova, Madina, et al. "Mesenchymal Stem Cell-Based Therapy for Rheumatoid Arthritis." International Journal of Molecular Sciences, U.S. National Library of Medicine, 27 Oct. 2021, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8584240/>.
 Salari, Valentina, et al. "The Anti-Inflammatory Properties of Mesenchymal Stem Cells in Epilepsy: Possible Treatments and Future Perspectives." International Journal of Molecular Sciences, U.S. National Library of Medicine, 18 Dec. 2020, The Anti-Inflammatory Properties of Mesenchymal Stem Cells in Epilepsy: Possible Treatments and Future Perspectives - PMC.