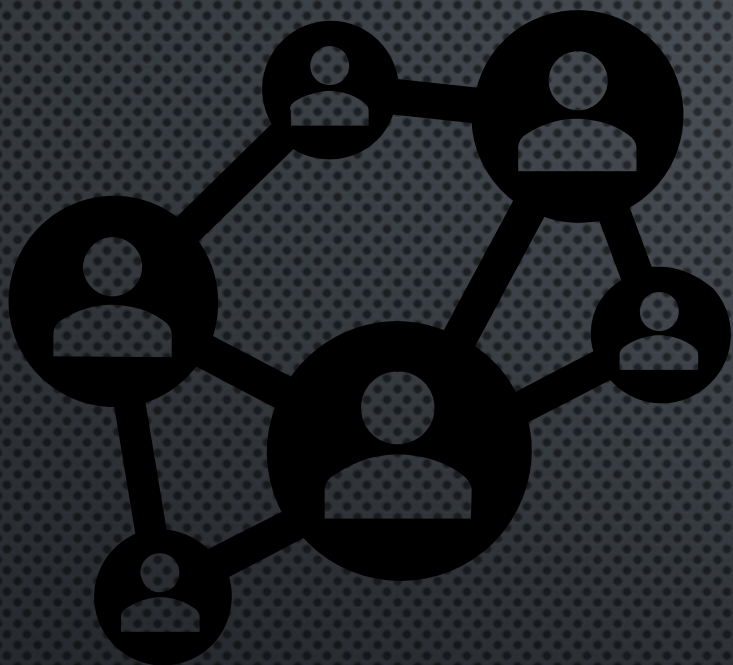


# INNOVATIONS IN RESEARCH

MESOBLASTS FOR CHRONIC LOW BACK PAIN

Marielle Araujo  
Northwell PM&R PGY3





## DISCLOSURES:

I HAVE NO FINANCIAL INTERESTS OR  
RELATIONSHIPS TO DISCLOSE



# CHRONIC AXIAL LOW BACK PAIN

- >4 MILLION PEOPLE IN THE UNITED STATES ARE AFFECTED BY CHRONIC LOW BACK PAIN





# DISCOGENIC BACK PAIN

## What is Degenerative Disc Disease?

DDD is a common condition which involves inflammation and degeneration of the intervertebral discs due to various factors including age, trauma or genetic pre-disposition.

The lack of 'cushioning' can result in spinal instability, mechanical stress and bony changes of the spine, which can eventually cause significant pain and loss of function.<sup>1</sup>



Source: [https://www.sec.gov/Archives/edgar/data/1345099/000156459019036315/meso-ex991\\_7.htm](https://www.sec.gov/Archives/edgar/data/1345099/000156459019036315/meso-ex991_7.htm)



# CURRENT TREATMENTS





# STEM CELLS FOR DISCOGENIC PAIN



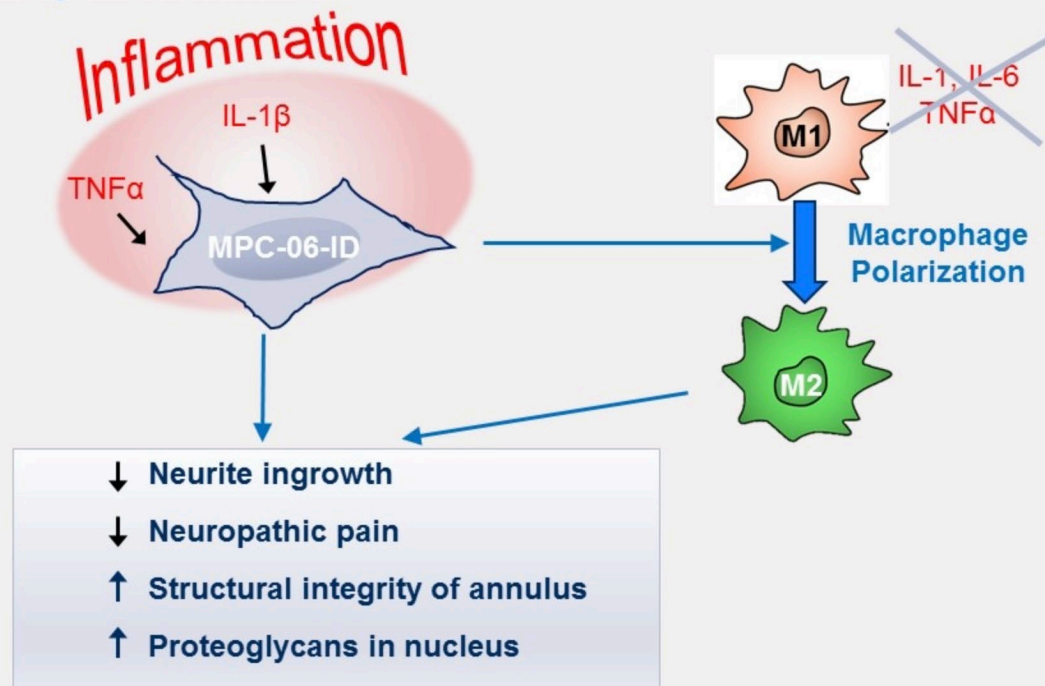
 **mesoblast**





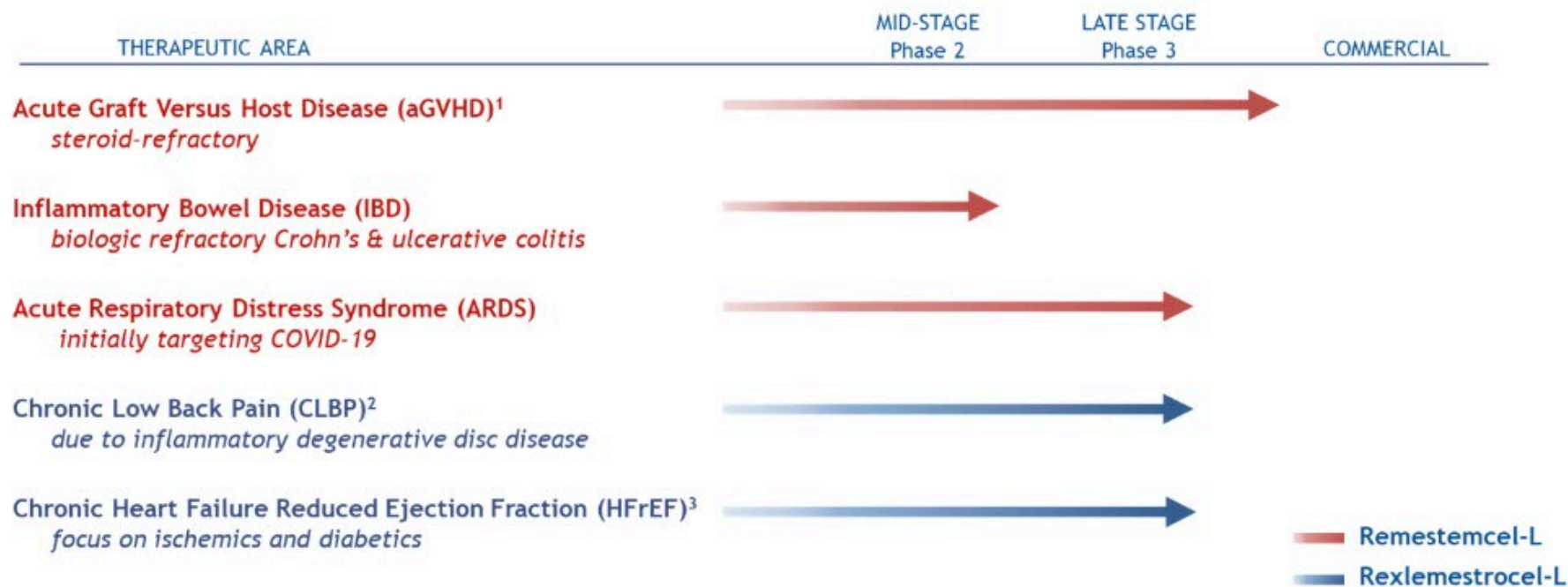
# MECHANISM OF ACTION

## MPC-06-ID: Potential Mechanisms of Action in Treating Inflammatory Disc Disease





## Late-Stage Clinical Pipeline



*This chart is figurative and does not purport to show individual trial progress within a clinical program*

1. JCR Pharmaceuticals Co., Ltd. (JCR), has the right to develop mesenchymal stromal cells (MSCs) in certain fields for the Japanese market, including for the treatment of hematological malignancies, such as Graft vs Host Disease, and for hypoxic ischemic encephalopathy (HIE). Mesoblast has the right to use safety and efficacy data generated by JCR to support its development and commercialization plans for remestemcel-L in the US and other major healthcare markets, including for GVHD and HIE
2. Grünenthal has an exclusive license to develop and commercialize rexlemestrocel-L for chronic low back pain in Europe and Latin America/Caribbean
3. Tasly Pharmaceuticals has exclusive rights for rexlemestrocel-L for the treatment or prevention of chronic heart failure in China





# PHASE 2 TRIAL

## **Allogeneic mesenchymal precursor cells treatment for chronic low back pain associated with degenerative disc disease: a prospective randomized, placebo-controlled 36-month study of safety and efficacy**

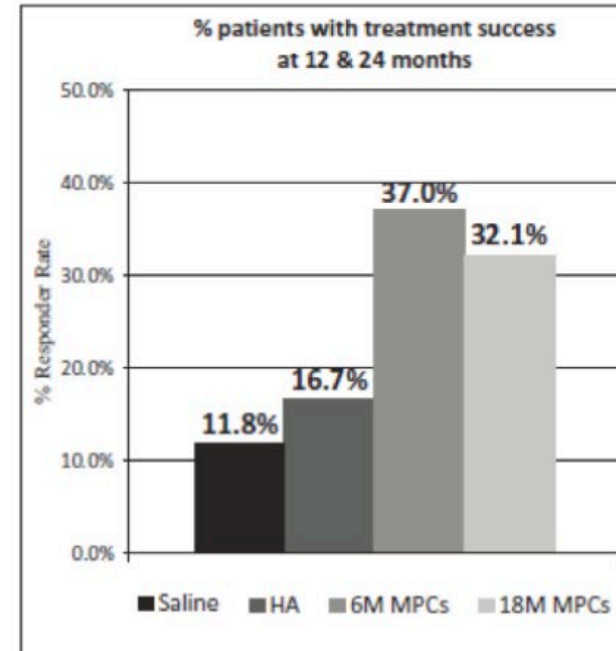
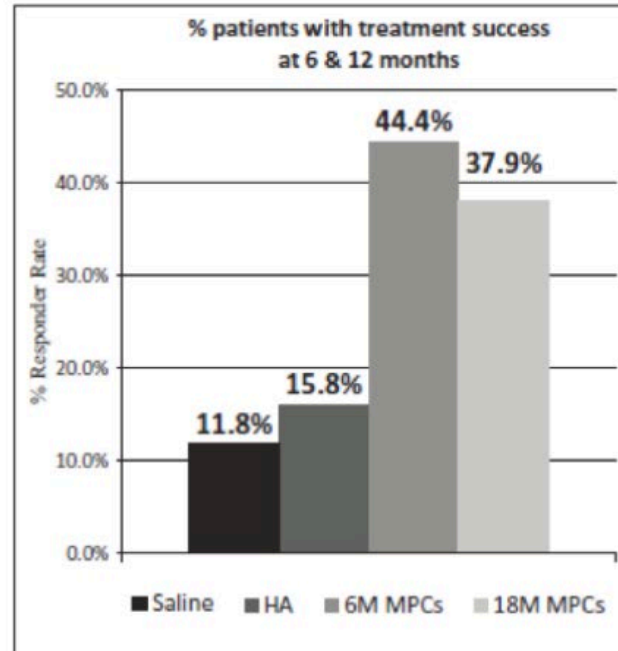
Kasra Amirdelfan <sup>1</sup>, Hyun Bae <sup>2</sup>, Tory McJunkin <sup>3</sup>, Michael DePalma <sup>4</sup>, Kee Kim <sup>5</sup>, William J Beckworth <sup>6</sup>, Gary Ghiselli <sup>7</sup>, James Scott Bainbridge <sup>7</sup>, Randall Dryer <sup>8</sup>, Timothy R Deer <sup>9</sup>, Roger D Brown <sup>10</sup>

Affiliations + expand

PMID: 33045417 DOI: [10.1016/j.spinee.2020.10.004](https://doi.org/10.1016/j.spinee.2020.10.004)



Proportion of patients with 50% VAS reduction, 15 point ODI reduction and no intervention over 24 months (treatment success)

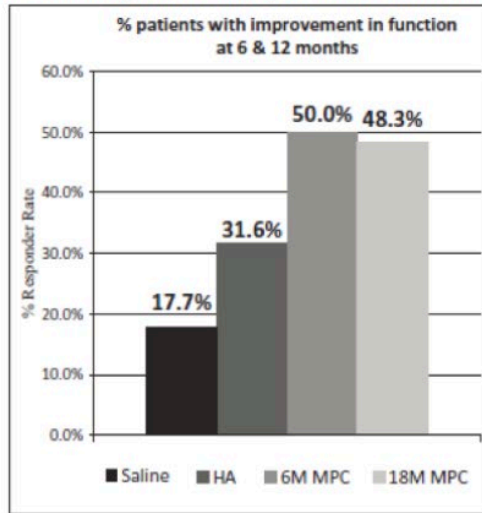


Source: <https://www.mesoblast.com/clinical-trial-results/mpc-06-id-phase-2>



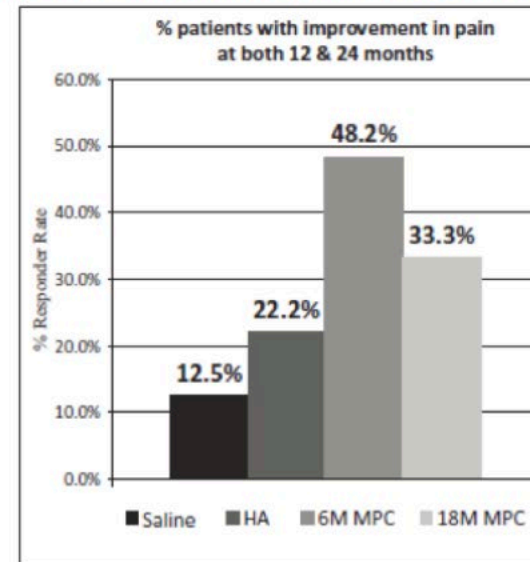
MPC groups have a greater proportion of patients with at least a 15 point improvement in function from baseline as measured by ODI at both 6 and 12 months, relative to controls

% patients with 15 point ODI improvement and no intervention



MPC groups have a greater proportion of patients with at least a 50% improvement in back pain at both 6 and 12 months relative to controls

% patients with 50% VAS reduction from baseline and no intervention



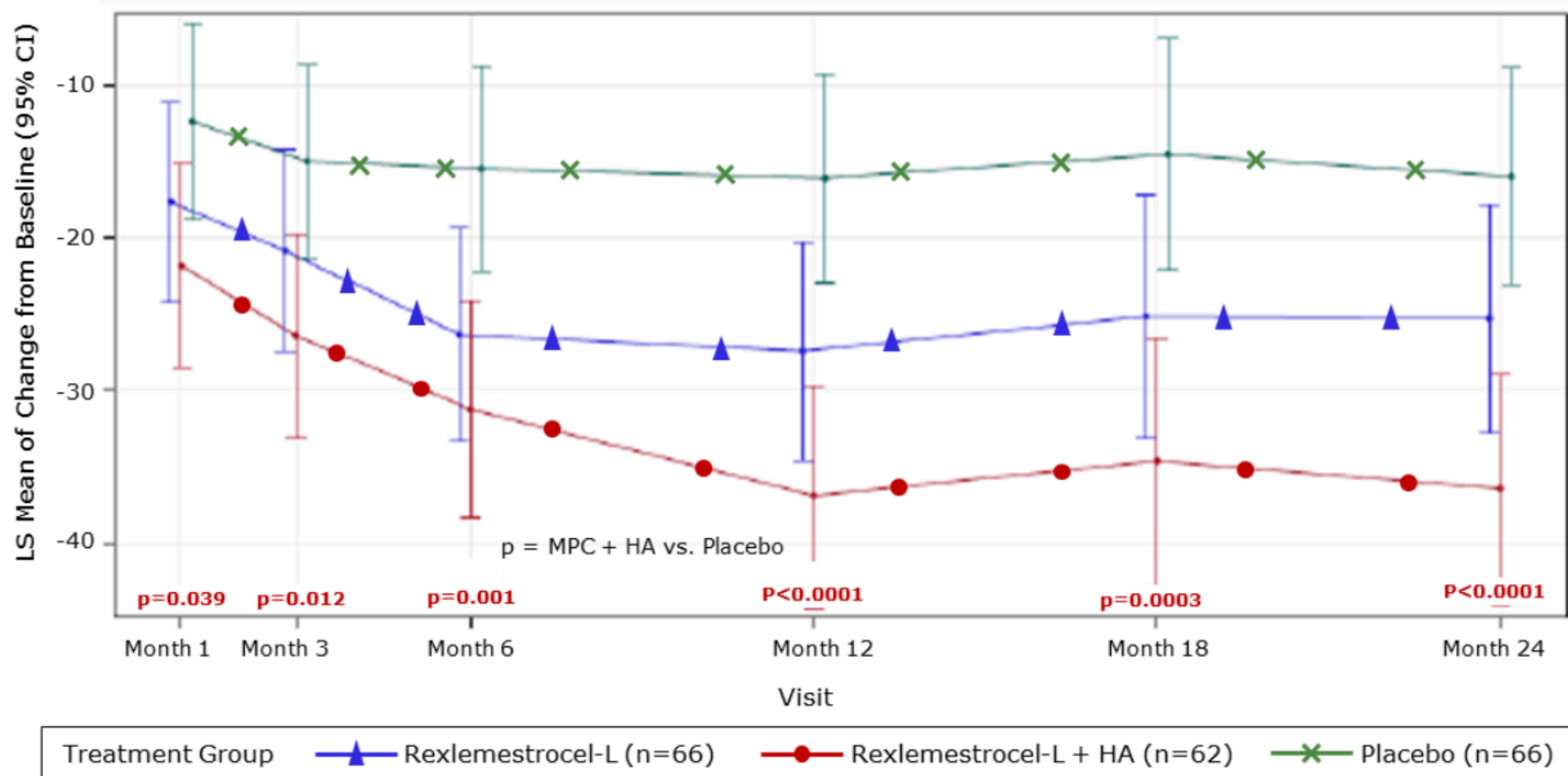


## ONGOING PHASE 3 TRIAL

Single Dose of Mesoblast's Allogeneic Cell Therapy Provides Durable Pain Reduction for at Least Three Years in Patients With Degenerative Disc Disease  
36-Month Results of Phase 3 Trial in Chronic Low Back Pain Presented at 2022 Biotech Showcase



Figure 2: LS Mean VAS Low Back Pain Change from Baseline - Duration CLBP < Median (n=194)





# DISCUSSION/QUESTIONS

- DOES STEM CELL TYPE MATTER?
- MSC LEAKAGE AND POTENTIAL FOR OSTEOPHYTE FORMATION?
- SPACE NEEDED?
- MULTIFACTORIAL PAIN GENERATOR
- CELL SURVIVAL IN DISC ENVIRONMENT





# REFERENCES

- [HTTPS://WWW.SEC.GOV/ARCHIVES/EDGAR/DATA/1345099/000156459019036315/MESO-EX991\\_7.HTM](https://www.sec.gov/archives/edgar/data/1345099/000156459019036315/meso-ex991_7.htm)
- [HTTPS://WWW.BIOSPACE.COM/ARTICLE/RELEASES/FDA-GRANTS-REGENERATIVE-MEDICINE-ADVANCED-THERAPY-RMAT-DESIGNATION-FOR-REXLEMESTROCEL-L-IN-CHRONIC-LOW-BACK-PAIN-/](https://www.biospace.com/article/releases/fda-grants-regenerative-medicine-advanced-therapy-rmat-designation-for-rexlemestrocel-l-in-chronic-low-back-pain/)
- AMIRDELFAN K, BAE H, MCJUNKIN T, DePALMA M, KIM K, BECKWORTH WJ, GHISELLI G, BAINBRIDGE JS, DRYER R, DEER TR, BROWN RD. ALLOGENEIC MESENCHYMAL PRECURSOR CELLS TREATMENT FOR CHRONIC LOW BACK PAIN ASSOCIATED WITH DEGENERATIVE DISC DISEASE: A PROSPECTIVE RANDOMIZED, PLACEBO-CONTROLLED 36-MONTH STUDY OF SAFETY AND EFFICACY. SPINE J. 2021 FEB;21(2):212-230. DOI: 10.1016/J.SPINEE.2020.10.004. EPUB 2020 OCT 9. PMID: 33045417.
- [HTTPS://INVESTORSMEDIA.MESOBLAST.COM/NODE/11801/HTML](https://investorsmedia.mesoblast.com/node/11801/html)
- CUCCURULLO, S. (2015). *PHYSICAL MEDICINE AND REHABILITATION BOARD REVIEW (THIRD)*. DEMOS.



THANK YOU

