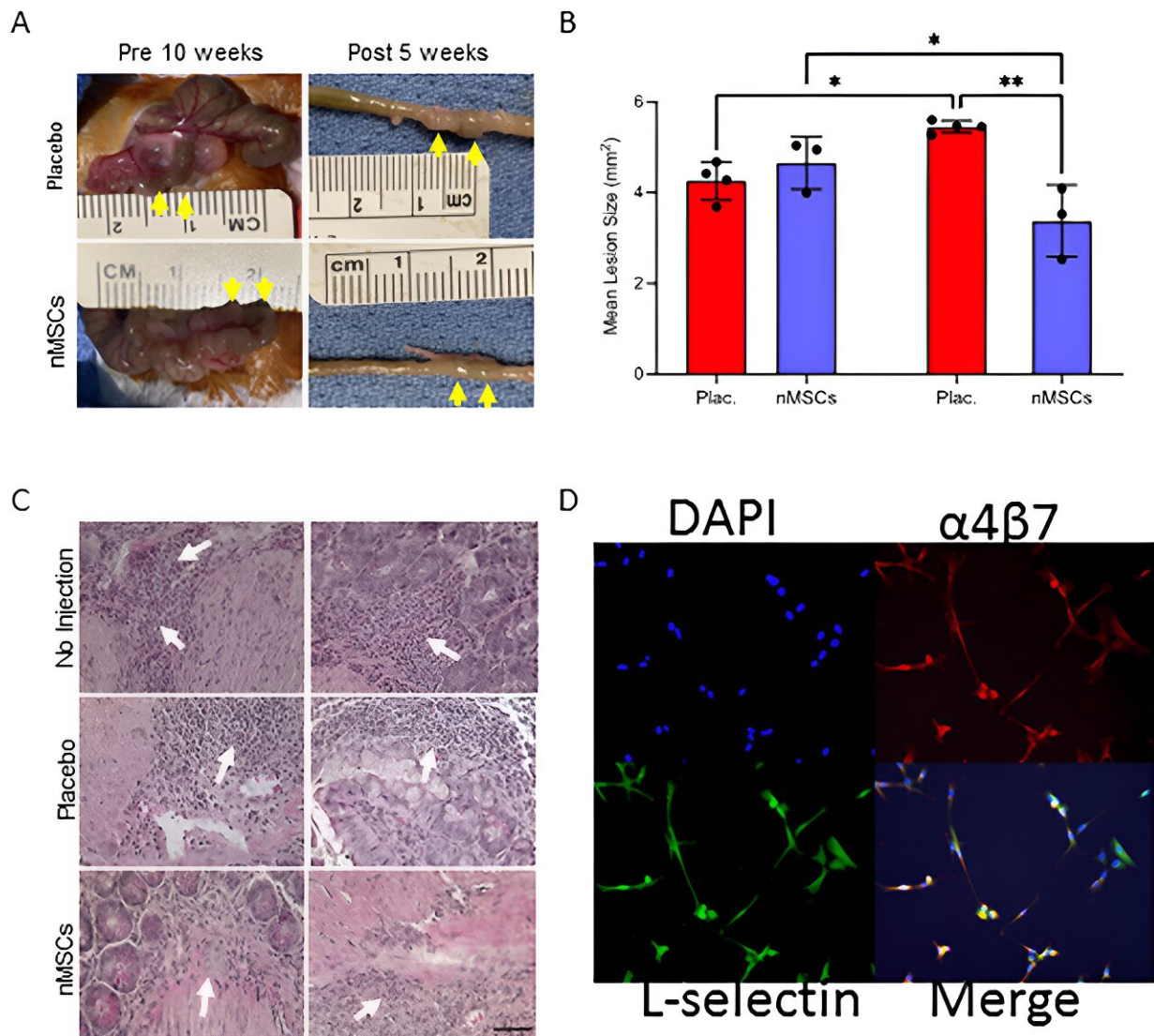


Neonatal stem cells from the heart could treat Crohn's disease

July 28 2023



Ileitis status following direct injection of nMSCs into SAMP mice: A,B)
 Representative images of intestinal tissue lesion at 5 weeks following a single

injection of nMSCs in SAMP mice. Ileitis lesion wound healing was analyzed by histology following nMSCs administration and compared with non-injections and placebo controls. Data are represented as mean \pm SEM (n = 3–4). C) Representative H&E staining images revealed reduced infiltration of inflammatory cells and cryptic damage within the submucosa and lamina propria in nMSC-administered mice compared to no-injection and placebo controls. White arrows depict areas of inflammatory cell infiltrate. nMSC treated animals have a subjectively lower level of immune cell presence in lesion tissue. D) Immunofluorescence staining of nMSCs with anti- $\alpha 4\beta 7$ and I-selectin (CD62L) antibodies demonstrating the expression of these pivotal proteins in gut-immune cell trafficking. Scale bars- 10 \times -200 μ m, 40 \times - 50 μ m. Statistical significance was analyzed by the Mann–Whitney U-test and p Advanced Therapeutics (2023). DOI: 10.1002/adtp.202200261

Research from Ann & Robert H. Lurie Children's Hospital of Chicago found that direct injection of neonatal mesenchymal stem cells, derived from heart tissue discarded during surgery, reduces intestinal inflammation and promotes wound healing in a mouse model of Crohn's disease-like ileitis, an illness marked by chronic intestinal inflammation and progressive tissue damage.

The study, published in the journal *Advanced Therapeutics*, offers a promising new and alternative treatment approach that avoids the pitfalls of current Crohn's disease medications, including diminishing effectiveness, severe side effects and increased risk of gastrointestinal dysfunction.

"Neonatal cardiac-derived [mesenchymal stem cells](#) have been used in a clinical trial to repair an injured heart, but this is the first time these potent cells have been studied in an inflammatory intestinal disease model," said senior author Arun Sharma, Ph.D., from Stanley Manne Children's Research Institute at Lurie Children's who is the Director of

Pediatric Urological Regenerative Medicine and Surgical Research, and Research Associate Professor of Urology and Biomedical Engineering at Northwestern University Feinberg School of Medicine and the McCormick School of Engineering, Northwestern University.

"Our results are encouraging and definitely provide a new platform to potentially treat aspects of chronic inflammatory bowel diseases."

Dr. Sharma explains that before it would be feasible to use these stem cells clinically to treat Crohn's disease, his team needs to overcome the hurdle of how they are administered. In the current animal model study, the [stem cells](#) were injected directly into the inflammatory lesions in the small intestine, which requires surgical procedures.

The next step then is to develop a safe way to inject them into the body through a vein, similar to performing a blood draw in the arm of a patient. More animal studies will be needed before this novel treatment approach can progress to clinical trials.

"Ultimately our goal is to utilize this cell type as treatment, but also as a [preventive measure](#), before signs and symptoms of Crohn's disease develop," said Dr. Sharma. "We also might be able to apply this approach to other inflammatory diseases. The potential is enormous, and we are excited to move forward."

More information: Muthukumar Gunasekaran et al, Multipotent Human Neonatal Cardiac-Derived Mesenchymal Stem Cells Modulate Ileitis In Vivo, *Advanced Therapeutics* (2023). [DOI: 10.1002/adtp.202200261](https://doi.org/10.1002/adtp.202200261)

Provided by Ann & Robert H. Lurie Children's Hospital of Chicago

Citation: Neonatal stem cells from the heart could treat Crohn's disease (2023, July 28) retrieved 28 April 2024 from

<https://medicalxpress.com/news/2023-07-neonatal-stem-cells-heart-crohn.html>

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