Mesenchymal Stem Cell Therapy for Celiac Disease

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This experiment was devoted to creating a mesenchymal stem cell therapy to repair the damage done by celiac disease, an autoimmune disease in which gluten produces an inflammatory response in the body, particularly the gastrointestinal system. The hypothesis states that if mesenchymal stem cells derived from human deciduous teeth are infused in situ, the recipient's body will receive protection from the alpha-gliadin protein, a major component of gluten that is found in wheat, barley, malt, and rye. The hypothesis was supported by statistically significant results. Gliadin was injected in five C57BL6 wild-type mice 2 times over the course of 28 days. T cells were extracted from the mouse spleens and injected into 15 Rag 1 -/- mice, which lack mature T cells. Each mouse was randomly placed in a gluten-free group, a gluten group, or an experimental mesenchymal stem cell group, each consisting of 5 mice. Disease scores, antibody assays, and ANOVA statistical analysis supported the hypothesis that the introduction of mesenchymal stem cells significantly mitigated the damage done by the protein gliadin in mice with gluten intolerance similar to celiac disease. While the experimental treatment demonstrated success, the results were still statistically significant from those mice on a gluten-free diet. With continued progression, this study can provide a foundation for the development of critical therapy to treat patients with celiac disease, helping to lessen the inflammatory response associated with gluten consumption and increasing patients' quality of life.

Awards Won:

Third Award of $1,000