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**Mechanisms of Ischemic Skeletal Muscle Regeneration Mediated by Mechanically Constrained Human Allogeneic Mesenchymal Stromal Cells**

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INTRODUCTION

- Critical limb threatening ischemia (CLTI) occurs when there is blockage in a major blood vessel of the leg preventing complete blood perfusion to the lower limb and foot, resulting in rest pain, tissue death, and a high incidence of amputation.
- No effective pharmacological treatment is available for CLTI, and some patients, especially diabetics, are not candidates for surgical procedures.
- Injection of bone marrow-derived mononuclear cells into leg muscles of CLTI patients has been shown to reduce the need for amputation; however, mesenchymal stem cells (MSCs), especially in 3D form (encapsulated) may be a more effective treatment for diabetes.
- Studies have shown that encapsulating stem cells in an alginate-based hydrogel has resulted in shedding of the host’s defenses and longer dwell time for the cells. It may also result in an alternate phenotype of the cells that could benefit muscle regeneration.
- We have adapted a polygenic mouse model of type II diabetes (TALLYHO) to include modeling of CLTI in order to determine the ability of MSCs & encapsulated mesenchymal stem cells (eMSCs) to ameliorate the tissue perfusion deficit and muscle damage in the context of diabetes.

BACKGROUND

- Critical limb threatening ischemia (CLTI) occurs when there is blockage in a major blood vessel of the leg preventing complete blood perfusion to the lower limb and foot, resulting in rest pain, tissue death, and a high incidence of amputation.
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MATERIALS and METHODS

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RESULTS

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PROPOSED MECHANISM

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OBJECTIVES

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