New approach to muscle regeneration restores function after traumatic injury without need for donor tissue

16 April 2015

Loss of muscle volume is a common and often debilitating outcome of traumatic orthopedic injury, resulting in muscle weakness and suboptimal limb function. A new therapeutic approach in which small pieces of autologous muscle can be expanded in a collagen hydrogel and used to regenerate functional muscle at the sight of injury, instead of relying on a donor muscle graft, would be especially beneficial for repairing large areas of muscle loss. A study demonstrating the feasibility of using autologous minced tissue grafts for muscle regeneration is published in *BioResearch Open Access*, a peer-reviewed journal from Mary Ann Liebert, Inc., publishers. The article is available on the *BioResearch Open Access* website.

In the article "An Autologous Muscle Tissue Expansion Approach for the Treatment of Volumetric Muscle Loss," Catherine L. Ward, PhD, Lisa Ji, MD, and Benjamin T. Corona, PhD, U.S. Army Institute of Surgical Research, Fort Sam Houston, TX, describe the method they developed to expand minced muscle grafts obtained from a rat model of volumetric muscle loss. They demonstrated similar functional muscle recovery in the rats treated with an expanded autologous muscle graft as those treated with a donor muscle graft. The new collagen hydrogel-based approach to expand the muscle cells required about 50% less minced graft tissue to achieve the same functional recovery, but the regenerated tissue had substantially fewer muscle fibers. The authors conclude that this novel approach is feasible and could eliminate the need for donor muscle tissue to treat volumetric muscle loss. Additional research should focus on optimizing the carrier materials used to expand the muscle grafts.

"The benefit of this methodology is that muscle regeneration is used to restore function, as opposed to replacing muscle with grafts," says BioResearch Open Access Editor Jane Taylor, PhD, MRC Centre for Regenerative Medicine, University of Edinburgh, Scotland. "This is a significant step forward in terms of tissue regenerative therapy for patients."

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