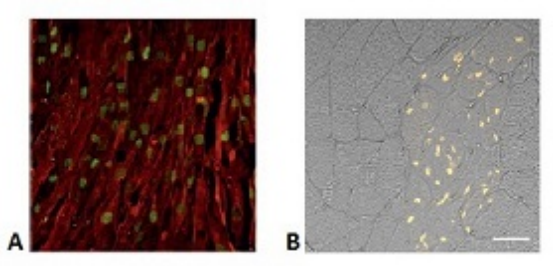
Technology transfer for academic research
A company of the LifeScience Foundation

Novel method for expansion of human satellite cells and muscle regeneration

Reference Number TO 03-00399

Challenge

Regenerative medicine proposes promising therapies to reconstruct skeletal muscle tissue lost due to muscular dystrophies, functional damage or traumatic injury. There is a tremendous medical need for the treatment of muscular dystrophies for instance since therapies so far can only delay disease progression but do not promote muscle tissue regeneration. Current research focuses on isolation of muscle cells or fibers which are subjected to expansion procedures and tissue culturing in vitro. However, these approaches suffer from various disadvantages such as lengthy and complicated cell manipulation and inefficient integration into existing tissue. Regarding these drawbacks, muscle stem cells as a source to generate efficiently skeletal muscle tissue are of considerable interest.



A) Significant enrichment of pure myogenic cells after ht. B) HMFFs transplanted after ht result in large human myofibers containing human nuclei.

Technology

Satellite cells are stem cells of the skeletal muscle and display an enormous potential for self-renewal and regeneration of skeletal muscle tissue. This cell type is indispensable for muscle generation and can be found in low abundance in a specific stem cell niche of skeletal muscle. Since these cells are extremely scarce and difficult to handle, their use has been very limited so far. The technology provides an efficient method to generate muscle fibers from satellite cells based on human muscle fiber fragments (HMFFs) which are obtained routinely by biopsy. Special culture conditions and hypothermic treatment (ht) result in significant enrichment and expansion of satellite cells associated to HMFFs. Transplantation of such treated HMFFs into mouse muscles showed a remarkable efficiency in muscle regeneration *in vivo*. This method allows the use of autologous satellite cells, reducing the risk for immunogenic effects, and enables also for long-term storage of this rare cell type.

Commercial Opportunity

Available for licensing or co-development

Developmental Status

Transplantation of human HMFFs in a mouse model shows promising results *in-vivo*.

Patent Situation

DE patent application filed in August 2014

Further Reading

Journal of Clinical Investigation 2014, 124, 10, 4257-4265.

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