



TECHNOLOGY

Myo Tak

OVERVIEW

In the field of striated and smooth muscle biology, the study of the mechanical properties of muscle has relied almost exclusively on multi-cellular preparations (whole muscles or muscle strip preparations). These preparations allow for tying, clipping, or clamping of muscle tissue to mechanical apparatus via tendon or bone attachment. Single cells, however, do not have any attachment points (tendons, connective tissues) making the study of mechanical properties of single muscle cells difficult. UMB inventors have addressed this issue through the development of an adhesive comprising of diverse sticky proteins and water miscible proteins. This substance has been dubbed MyoTak, and is specific for the adherence of single cardiac myocytes for evaluation and study of its mechanical properties. Current methods of individual cell mechanical studies use a carbon filament attachment method to capture individual cells. However, problems from carbon filament attachment arise due to its unreliable attachment efficiency (highly variable), unknown mechanism of action (proposed to be electrostatic), and inability to remain strongly attached to allow large cellular contractions. MyoTak greatly enhances attachment efficiency (# of cells attached and ease of attachment) and increases attachment strength, allowing for the generation of larger forces.

APPLICATIONS

MyoTak has been developed for use in the adherence of single, live muscle cells. However applications fall under any research setting in which there is a need for a strongly bonded, stationary single cell. The accurate study of single muscle cells is highly valuable for the understanding of diseases such as muscular dystrophy, motor neuron diseases, and inflammatory myopathies.

ADVANTAGES

-MyoTak is a reliable, reproducible attachment system for use with single cardiac myocytes -A method for cell attachment has been developed to apply MyoTak to micro-rods quickly and without damage to instrumentation - MyoTak can be fluorescently labeled for imaging and is adaptable to be used in any confocal microscope system including ultra-high speed and multiphoton systems as well as laser flash photolysis -Multiple, reproducible experiments can be conducted on the same single cell.

STAGE OF DEVELOPMENT

Preliminary experiments show successful attachment of a single muscle cell with improved measurements in stretch induced burst of Ca²⁺ sparks than previously described (1.4x) with a similar length change.

R&D REQUIRED

Require optimization of MyoTak formulation and methodology to increase the window of opportunity for mechanical measurements.

LICENSING POTENTIAL

UM seeks to develop and commercialize by an exclusive or non-exclusive license agreement and/or sponsored research with a company active in the area.

CONTACT INFO

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Additional Information

INSTITUTION

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PATENT STATUS

U.S. Patent 8,921,066 issued 12/30/2014, Trademark 4,084,803 issued 1/10/2012

LICENSE STATUS

Available for licensing

CATEGORIES

- Research Tools, Antibodies, & Reagents

INVESTIGATOR(S)

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EXTERNAL RESOURCES

- [Development of the cytodetachment technique to quantify mechanical adhesiveness of the single cell.](#)

CW-2010-065