Mantarray™

Platform for Human-Relevant 3D
Engineered Muscle Tissue Analysis

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Deliver Clinically-relevant Functional Data Earlier

The Mantarray™ platform enables the discovery, safety, and efficacy testing of new therapeutics by providing parallel analysis of 3D engineered muscle tissues with adult-like functional profiles.

The Mantarray system features a novel magnetic sensing technique that can detect the contraction of Engineered Muscle Tissues (EMTs). This enables the user to measure the contractility of 24 tissues in parallel, and in real time. The system features user-friendly software that takes away the requirement for manual calculations of contractility, delivering contractility data at the click of a mouse.

The Mantarray system uses ANSI/SLAS compliant tissue casting devices that can be performed manually or via automation. EMTs can be used in nearly any kind of assay, including force (contractility), calcium, and structural assays. Mantarray brings EMTs into your own lab, allowing you to use your own cells to achieve your research goals.

Mantarray brings clinically-relevant functional data into the earliest stages of preclinical testing of new medicines.

Mantarray tissues are formed between a rigid post and a flexible post. When the tissue contracts, it deflects the flexible post. Mantarray leverages a proprietary, label-free, non-optical magnetic measurement system for direct contractility assessment of up to 24 parallel 3D engineered muscle tissues simultaneously.

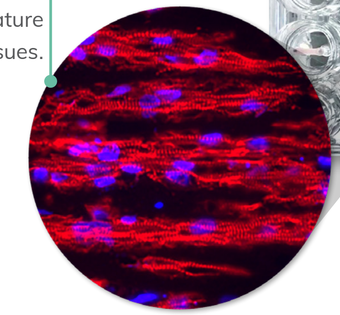
With the Mantarray platform, scientists can achieve clinically-relevant functional measurements of human iPSC-derived engineered muscle tissue contractility, with a throughput and reproducibility compatible with higher-throughput screening workflows.

Mantarray Key Characteristics

Electromechanical Stimulation
Compatible with electromechanical stimulation methods for advanced tissue maturation.

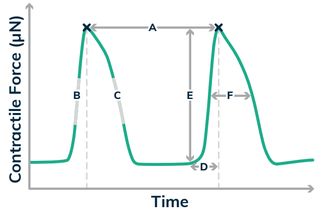
Scaleable Measurement
The 24-well format enables high-throughput compatible, label-free, non-optical measurements.

Improve Structure and Function
Mantarray aids in providing more structurally and functionally mature 3D engineered muscle tissues.



Workflow Simplicity
Easy 3D tissue casting, measurement, and data analysis. No matlab needed, all GUI.

Clinically-relevant Contractility
Advancing data using clinically-relevant functional measurements of contractility.



A. Frequency
B. Rate of Contraction/Systole
C. Rate of Relaxation/Diastole
D. Time to Max Twitch (Peak)
E. Maximal Twitch Amplitude
F. Full Width at Half Max (FWHM)

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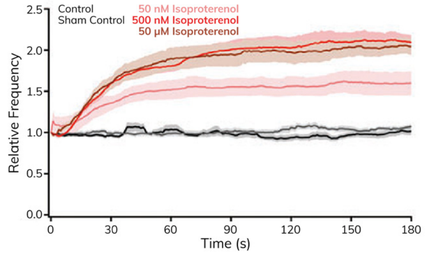
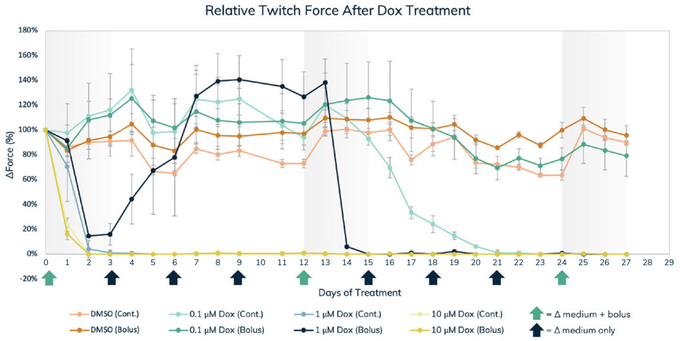
Applications

Safety Screening

Magnetic Detection of Drug-induced Contractile Changes

The magnetic detection approach can measure acute (minutes) and chronic (days) drug responses. Drugs such as isoproterenol (left) can be measured on the order of seconds to minutes, with enough sensitivity to measure dose response-like behavior. Additionally, longer-term chronic experiments such as doxorubicin (right) can be performed over the course of days.

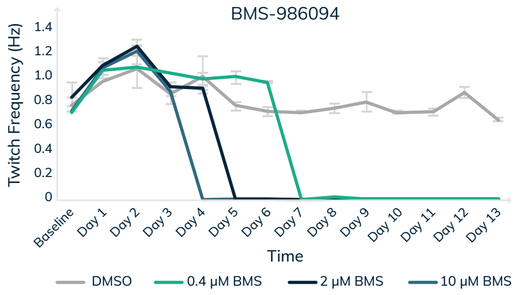


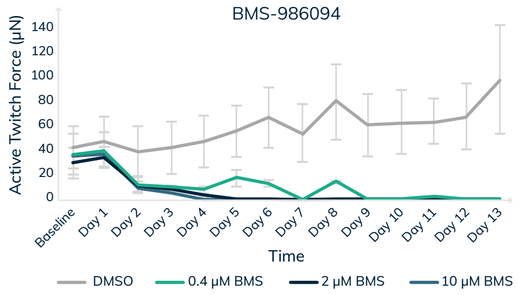


Left Figure: Bielawski et al. Tissue Eng Part C Methods (2016) 22(10):932-940.

Case Study: Mantarray System Identifies Off Target Cardiotoxic Effects

BMS-986094 is a hepatitis C treatment that failed in Phase II clinical trials due to cardiotoxic side effects. Here we show a dose-dependent response to BMS-986094 using the Mantarray platform, demonstrating how the system would have better predicted and modeled the cardiac safety concerns.

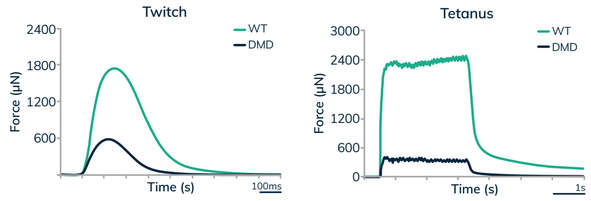




Disease Modeling and Therapeutic Discovery

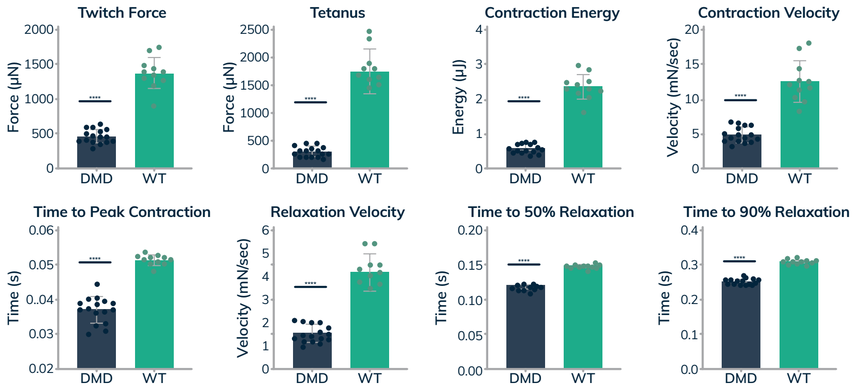
Modeling Duchenne Muscular Dystrophy (DMD) with iPSC-derived 3D Engineered Heart Tissues

Complex diseases require complex models. EMTs can be made from cells sourced from patients and used to test whether a new therapy will improve or recover healthy contraction. 3D Engineered Heart Tissues (EHTs) can be generated from human iPSC-derived cells with healthy and diseased phenotypes.



Multi-modal Mantarray Data Exhibit Disease Stratification

Isogenic controls or corrected cell lines can be used to provide clear stratification between healthy and diseased phenotypes. Validate new therapies using human models of muscle contractility. Stratifying differences between healthy disease model EHTs provides a platform for discovery and validation of new therapeutics.



Get Mantarray in Your Lab

Contact Us

If you're interested in accessing Mantarray technology and bringing 3D EMTs into your lab, please contact us to learn more.

Learn More

Visit the Mantarray webpage to stay up-to-date on the latest Manatarray news and data.

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