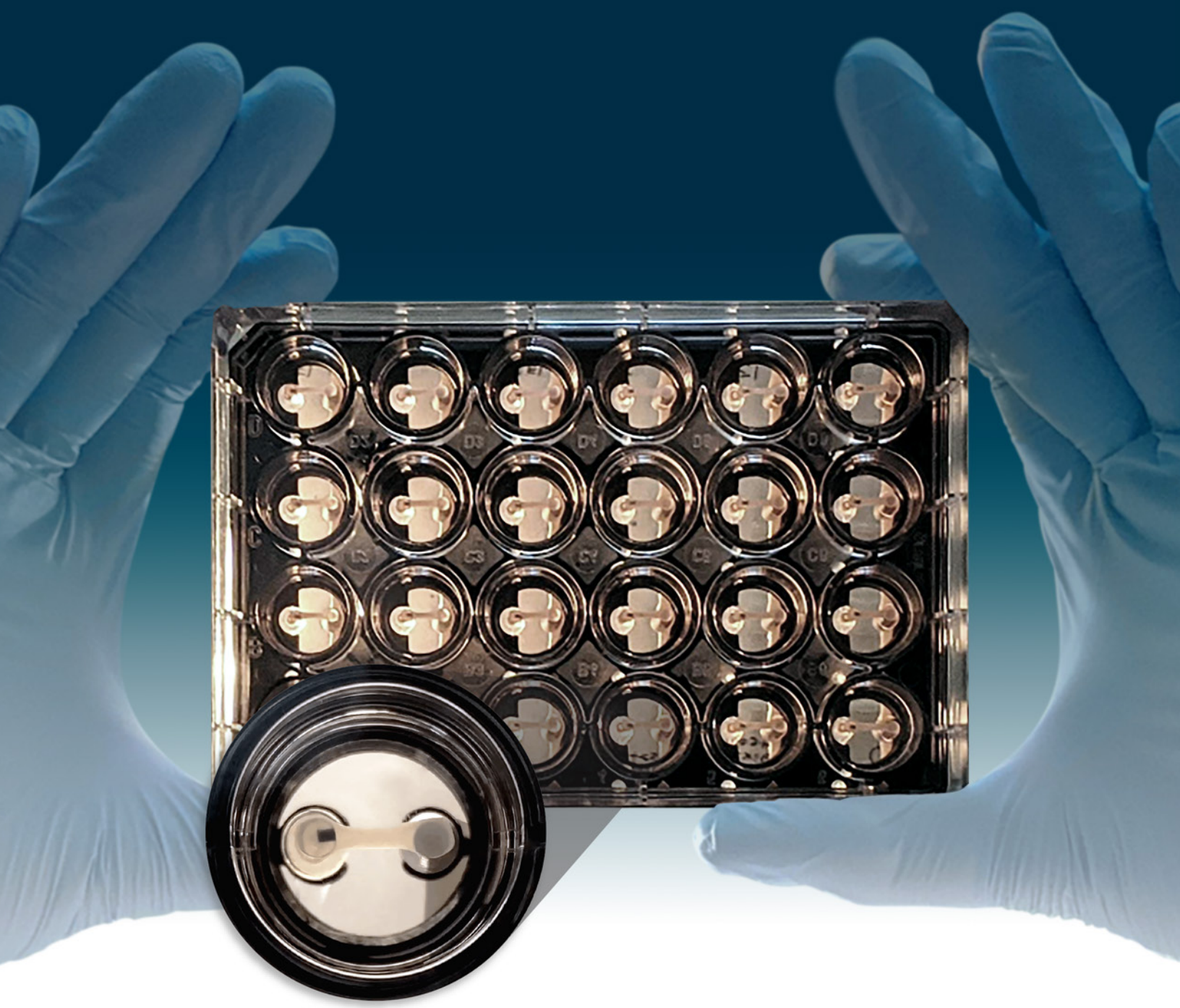
Mantarray™



Platform for Human-Relevant 3D
Engineered Muscle Tissue Analysis

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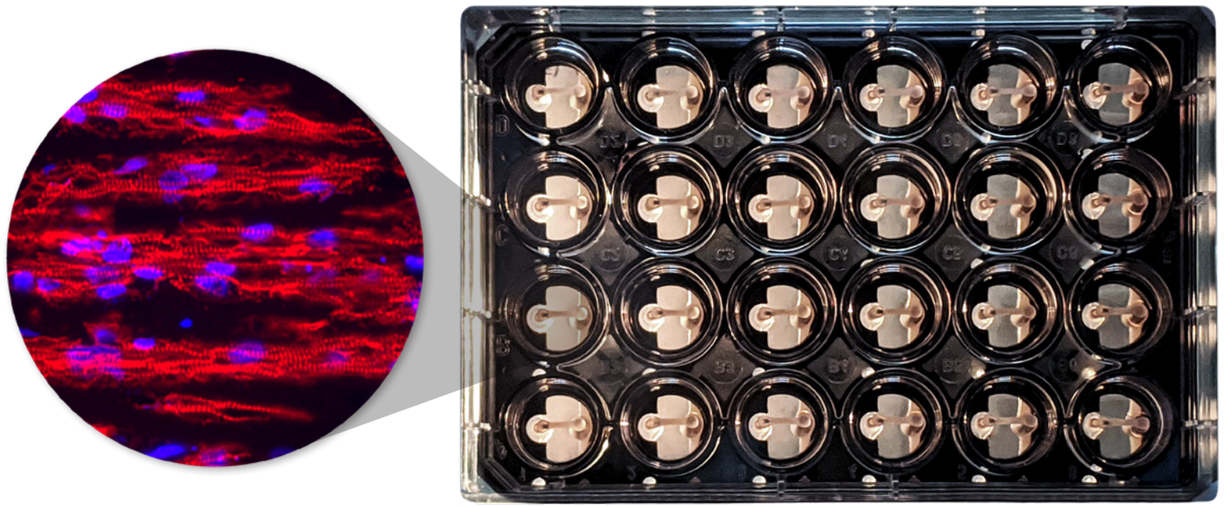
Deliver Clinically-relevant Functional Data Earlier

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 Key Characteristics

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

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

Electrical Stimulation
Mantarray is compatible with electrical stimulation methods for advanced tissue maturation.

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

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

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.

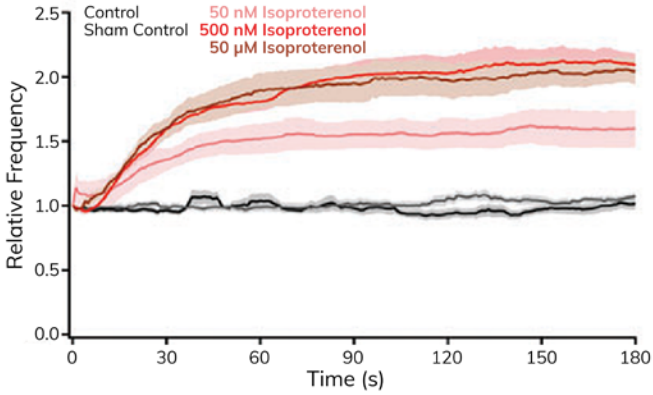
With the Mantarray platform, scientists can achieve clinically-relevant functional measurements of human iPSC-derived engineered muscle tissue contractility, with a reproducibility compatible with higher-throughput screening workflows.

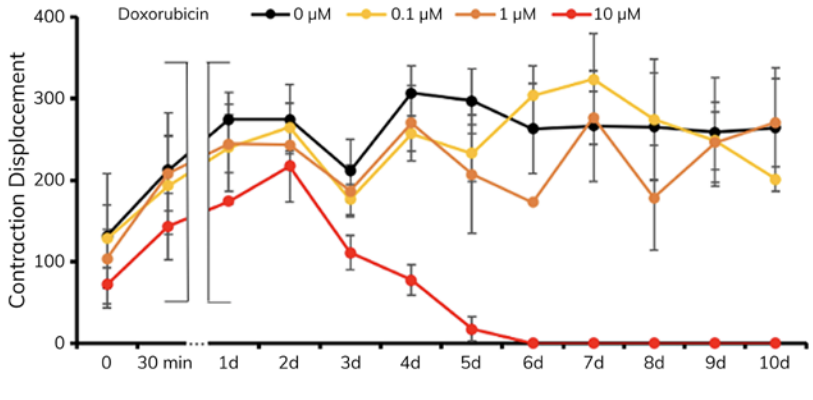
Applications

Safety Screening

Magnetic Detection of Drug-induced Contractile Changes

The magnetic detection approach can measure both 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.*

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.

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