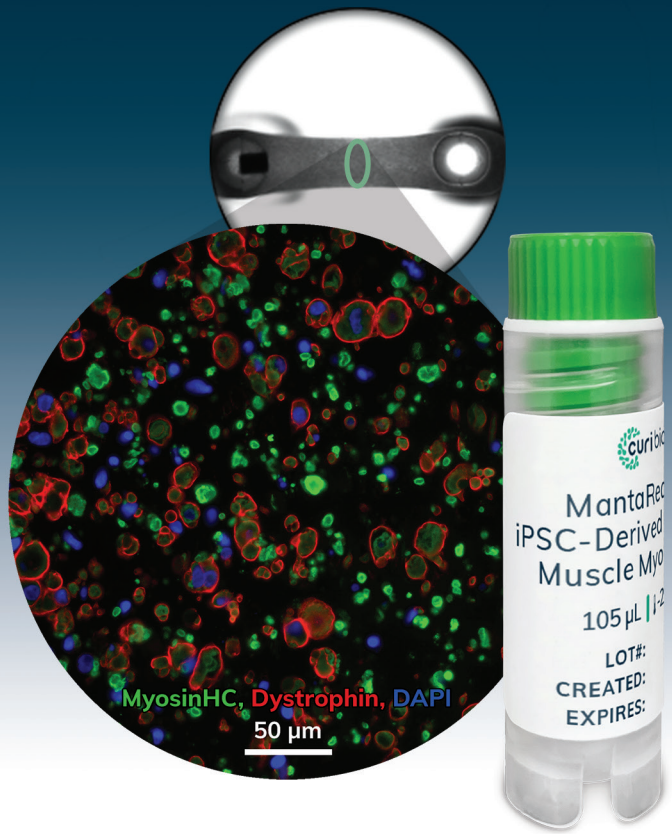
MantaReady™

iPSC-Derived Skeletal Muscle Myoblasts



Ready to Cast Isogenic Control and Duchenne Muscular Dystrophy Human Myoblasts for 3D Engineered Muscle Tissue Experiments

curi bio

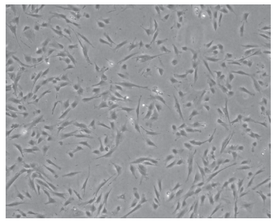
Enable Discovery and Validation of New Therapeutics

High Fidelity Duchenne Muscular Dystrophy (DMD) Tissue Model

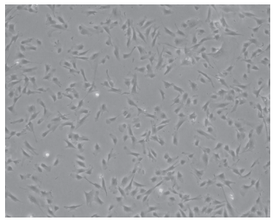
Duchenne muscular dystrophy is a genetic disorder characterized by progressive muscle degeneration and weakness due to the alterations of a protein called dystrophin that helps keep muscle cells intact (MDA.org). A number of mutations within the dystrophin gene can result in DMD or a less severe disorder known as Becker Muscular dystrophy. The earliest clinical symptom of DMD is primarily skeletal muscle weakness, followed by progressive loss of cardiac and diaphragm function.

2D Morphology

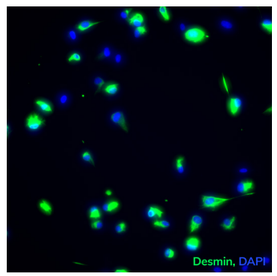
Myoblasts display typical compact morphology with doubling times between 20-24 hours. Myoblast purity is above 80% as revealed through Desmin staining. Within just five days, the myoblasts rapidly fuse at high density, forming striated, multinucleated, and contractile myotubes.



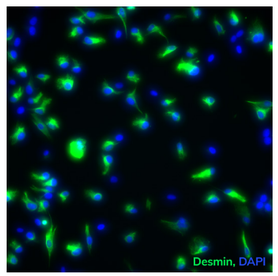
DMD Morphology



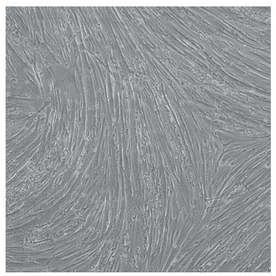
WT Morphology



DMD 94.6% Desmin+



WT 87.9% Desmin+

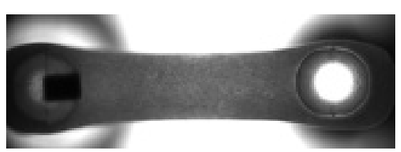


DMD Fusion

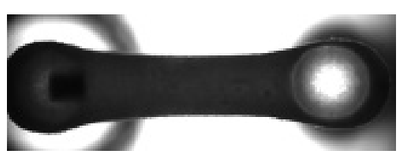
WT Fusion

3D Morphology

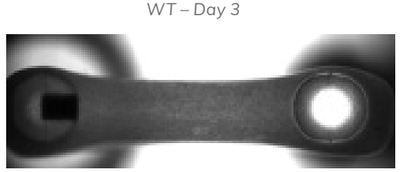
3D morphology is stable through 43 days of culture. Increased density and reduced size of the 3D constucts indicates greater compaction as the tissues remodel and mature over time.



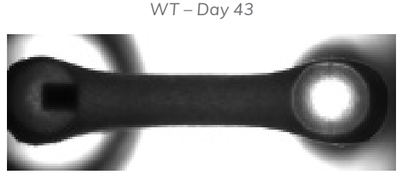
WT – Day 3



WT – Day 43



DMD – Day 3



DMD – Day 43

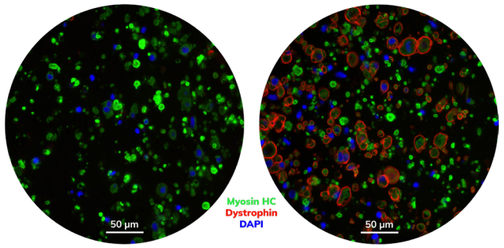
Options to Fit Your Experiment Needs

Skeletal EMTs Vial Volumes

- 1 Million Cell Cryovial
- 6 Million Cell Cryovial
- 12 Million Cell Cryovial

Skeletal EMTs + Media Kit Volumes

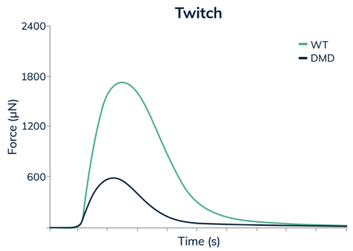
- 6 Million Cell Cryovial
- 12 Million Cell Cryovial

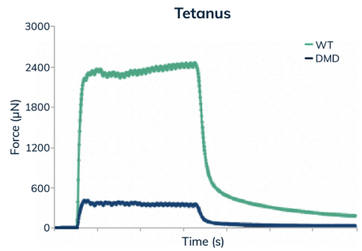


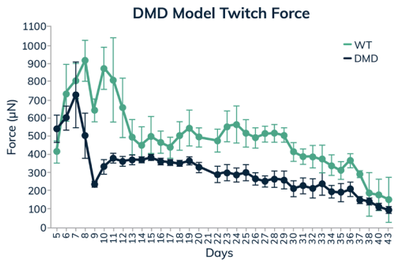
DMD Merge *WT Merge*

DMD Tissues Show Significant Contractile Deficits and Greater Fatigue Compared to Isogenic Control Engineered Muscle Tissues

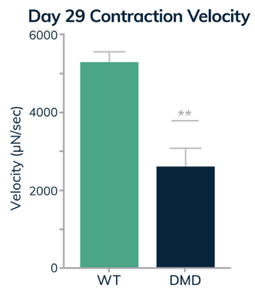
Skeletal engineered muscle tissues (EMTs) bearing a dystrophin-null phenotype (a model of DMD) exhibited significant reductions in contractile twitch and tetanic force and kinetics compared with healthy (wild type) isogenic controls as measured on the Mantarray™ platform. A significant disease phenotype presents early in this model and persists through over a month in 3D culture. Delayed contraction and relaxation rates indicate impaired muscle function in the DMD line.

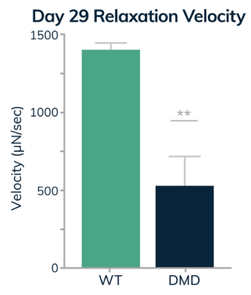


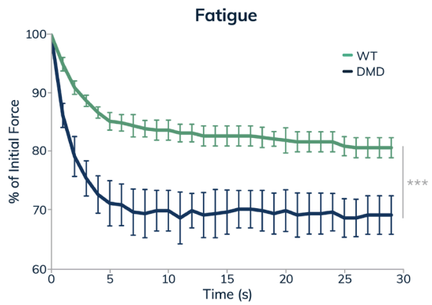




DMD tissues also display greater fatigue following repetitive contractions by electrical stimulation, similar to in vivo models of the disease and clinical manifestation. This shows the potential to utilize this model to precisely measure a drug's affect on fatiguability.

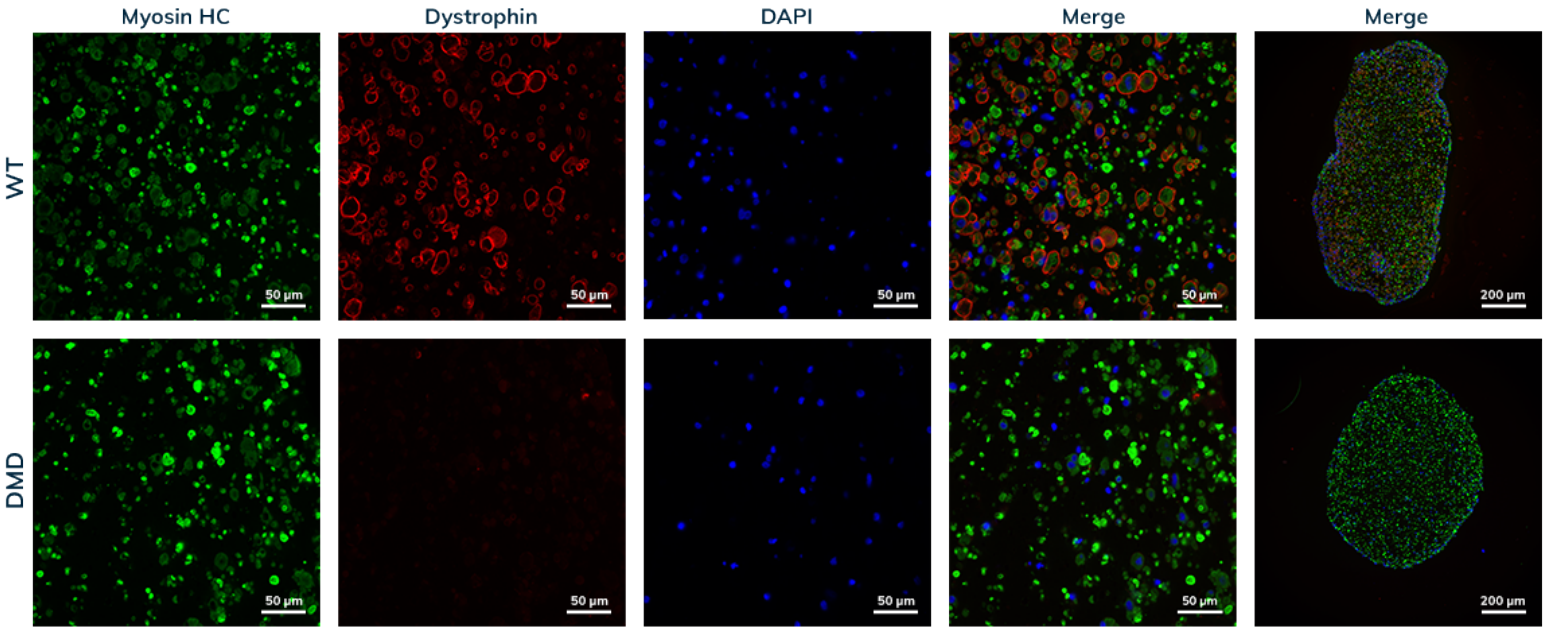






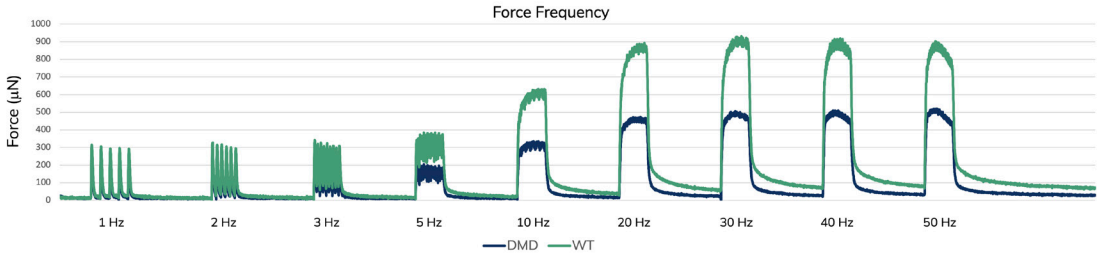
Duchenne Muscular Dystrophy (DMD) Tissues Lack Dystrophin Positive Myotubes

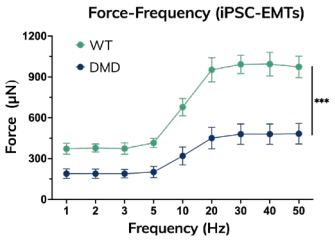
Histological analysis of tissue cross sections showed distribution of myosin positive myotubes throughout the EMT with a pronounced dystrophin ring stained at the cell membrane in healthy tissues. DMD tissues, as expected, completely lacked dystrophin rings surrounding myosin positive myotubes. These data demonstrate the ability of Mantarray™ to uniquely stratify healthy and diseased phenotypes to recapitulate native developmental architecture and muscle function.



Positive Force-Frequency Relationship in iPSC-DMD Model Closely Mimics That Seen in Human Skeletal Muscles

The force-frequency relationship, recorded on Curi Bio's Mantarray platform, presents the amount of contractile force skeletal muscle produces as a function of electrical stimulation frequency of activation. MantaReady™ isogenic cells not only show a clear disease phenotype, but also demonstrate the ability of this model to recapitulate in vivo muscle function to improve the translatability of pre-clinical testing.





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