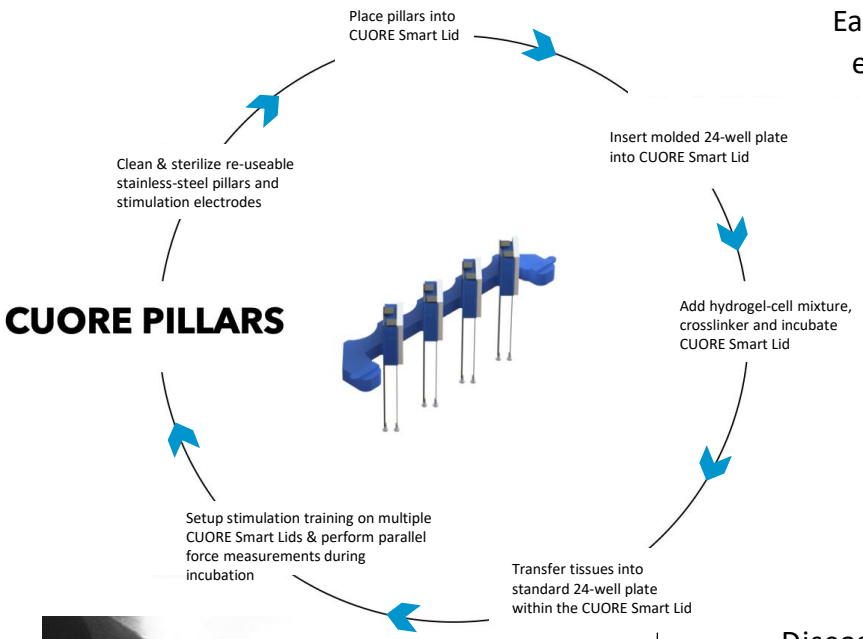
CUORE FACT SHEET

MULTI- CHANNEL 3D MUSCLE FORCE ASSAY

In tissue engineering three-dimensional (3D) engineered muscle tissue models show to be a promising tool to investigate skeletal muscle or cardiac diseases and drug response at different stages of drug development. The lack of a functional high throughput sensing system for skeletal and cardiac muscle fibres enabled our latest development – the **CUORE**, a **multi-channel 3D muscle force assay**, to measure tissue contractility in 24-well plates.

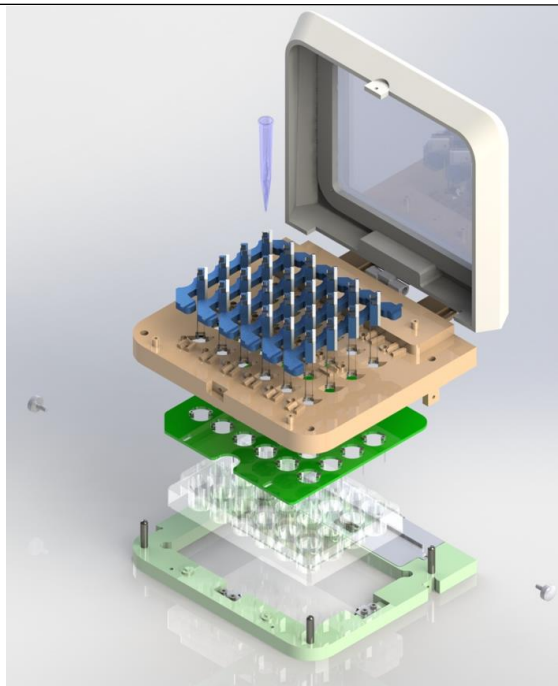
CUORE TECHNOLOGY

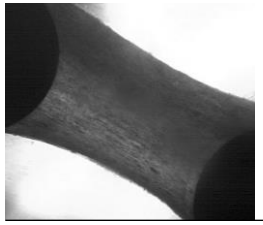


Each well contains a pair of pillars, close to the bottom of a 24-well plate, where engineered muscle tissues can be cultured in between, using a **molded** well-plate.

Force changes due to simultaneous **electrical stimulations** between individual pillars can then be **monitored in parallel inside of an incubator.**

SMART LID





MUSCLE TISSUE

APPLICATIONS

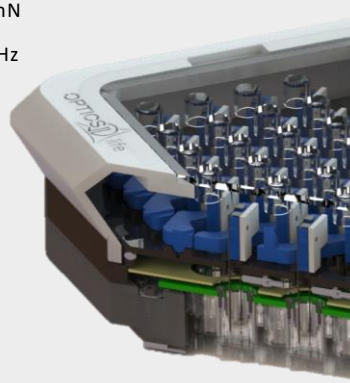
- Disease **modelling** & **phenotyping**
- Short & long-term **cardiotoxicity**
- **Drug efficacy** testing
- **Tissue** engineering
- **Stem cell** maturation

FUNCTIONALITIES

- Direct online force measurement
- Electrical stimulation continuously for full 24-well plate – extendable to 4 smart lids
- Parallel force read-out of 4 tissues
- Automated full 24-well plate recording in less than a minute
- Force readout and muscle bundle training inside incubator
- User customised experiments and training designs
- Sterile and smooth workflow through accessible CUORE Smart Lid design
- Re-usable and biocompatible stainless-steel pillars (No drug absorption through PDMS)
- Offline post processing and analysis
- Future scalability to multiple 96-well plates

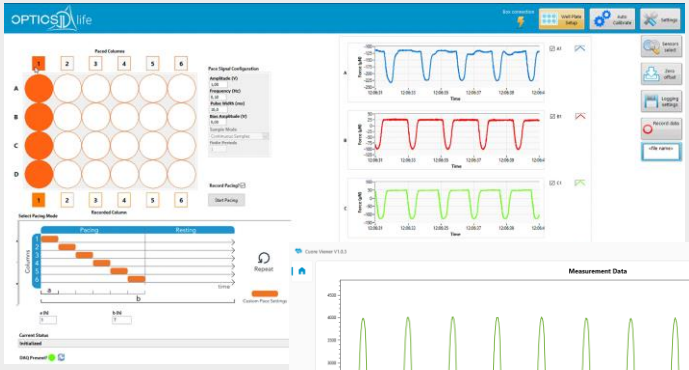
SPECIFICATIONS

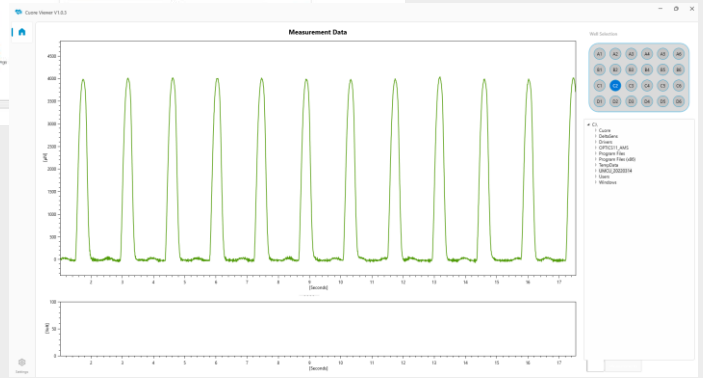
Force Range	10nN – 10mN
Force data acquisition rate	100Hz – 5kHz
Culturable tissue size	1 – 4 mm
Electrical stimulation	0 – 150 Hz
# of Tissues measured in parallel	4
Automated full 24-well plate format recording	Yes
# of Tissues paced in parallel* within on Smart lid	4 - 24
Max # of smart lids paced simultaneously	4
Variable of hydrogel mold volumes	30 – 75 μL
Compatible imaging	Brightfield, Phase contract & Fluorescence



OPERATIONAL SOFTWARE

- Intuitive experiment design
- Add labels to specific tissue (groups) for analysis
- Live display of 4 force graphs
- Select simulation mode
- Easy pacing waveform tuning
- Step-by-step guidance system
- Select columns to pace & measure
- Live feedback of experiment status
- File storage of all force & pacing data





VIEWER ANALYSIS SOFTWARE

View and analyze force & simulation data

Filter data based on labeling

Automated extraction: Peak force, T1, T2, dT1, dT2

Measurement tool: PP-interval, peak difference, velocity

Exportable statistics (CSV-format)

Clear well-plate navigation

Experiment folder selection

** Sequentially, however with fast switching times, providing parallel-like stimulation.*

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