

A high throughput muscle contractility platform for disease modelling

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Product Director

OPTICS  life

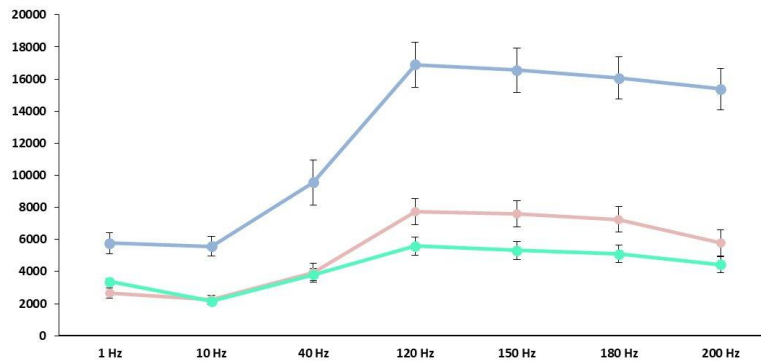


In-vivo & in-situ Muscle physiology Tests

- > Direct measurements on mice or rat
- > Requires surgery – labor intensive
- > Typically, 60-150 mice/rat in study
- > **We can measure the same data in a much more scalable way with Cuore**

➤ Force frequency – Tibialis muscle

Force Peak (mN/g Tibialis Weight)



➤ Fatigue test – Tibialis muscle

Force Peak (mN/g Tibialis mass)

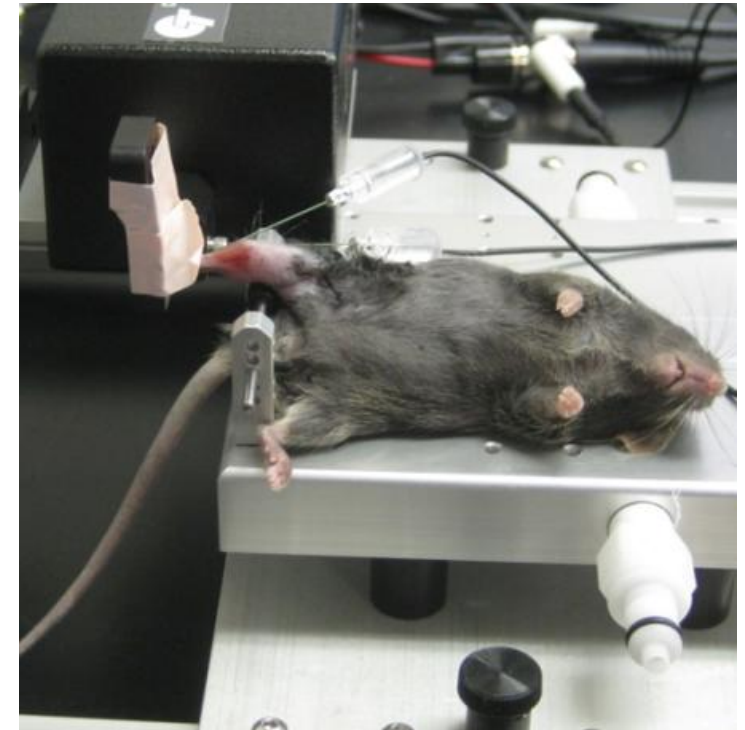
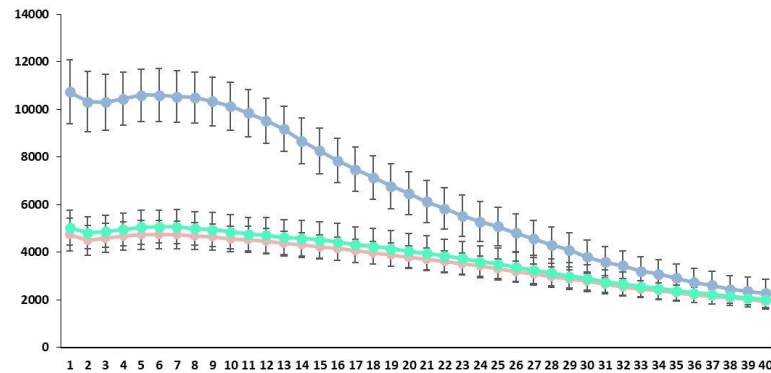


Image courtesy of Aurora scientific

Benefits of Non-Animal Models (NAMs)

Benefits of NAMs

- > Better representation of human physiology
- > Ability for wider ethnic representation
- > More human relevant risk assessment
- > Opportunity for personalized medicine / patient specific
- > Scalable and accessible

But,

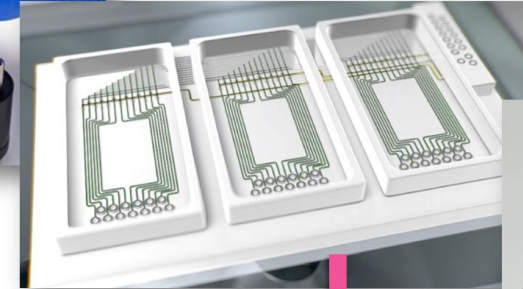
- Little benchmark data available for systematic comparisons between NAM, animal models and clinical outcome
- NAMs and animal studies are complementary not competitive

Cuore-based (demonstrator #1)



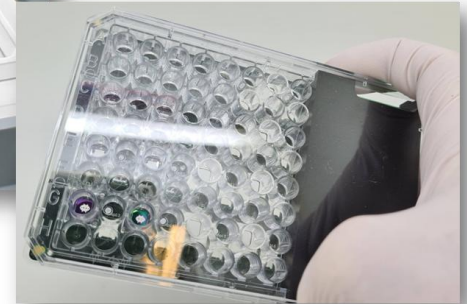
Modularity
& microfluidics

TOP-based (demonstrator #2)



Autonomy
& scalability

SMWP (demonstrator #3)

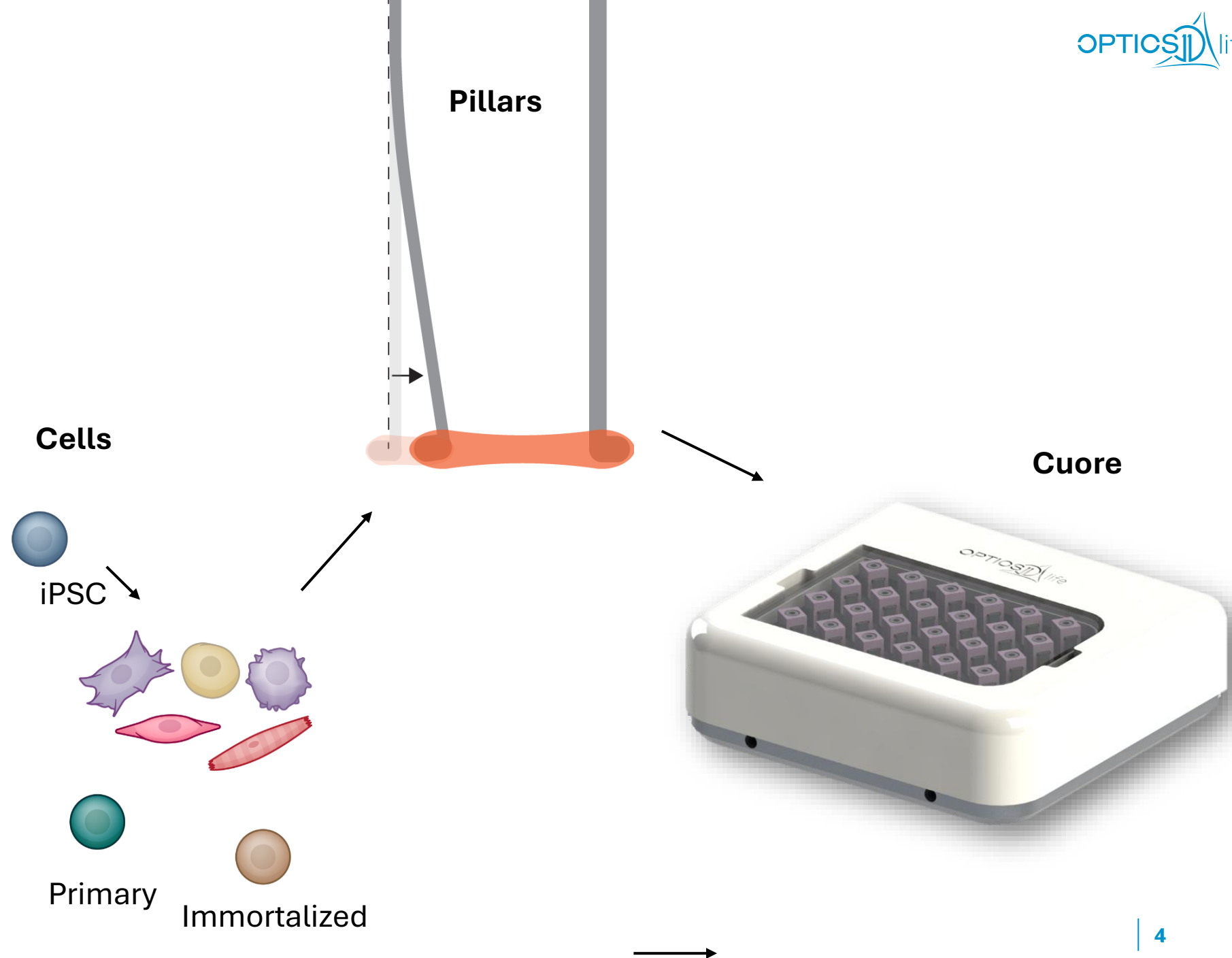


BioMed 3 – Demo 1-3



Advanced in-vitro model for muscle applications

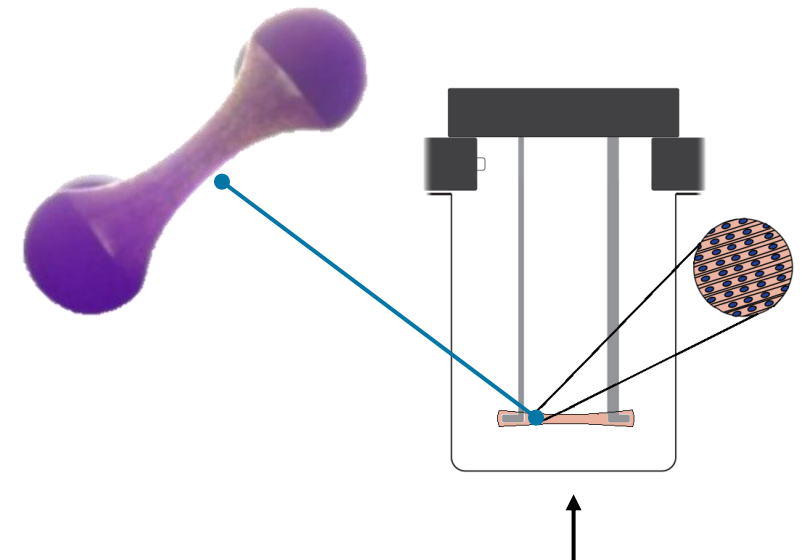
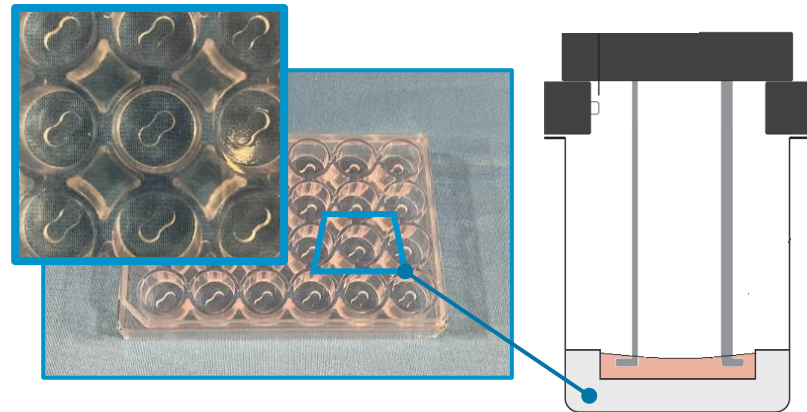
Adaptable to many cell types



Advanced in-vitro model for muscle applications

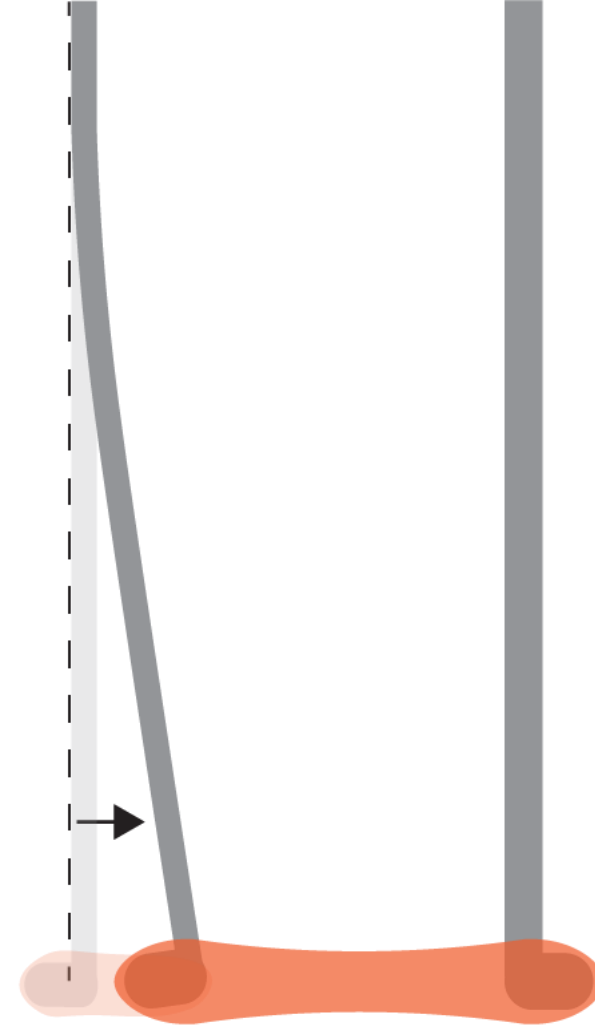
Muscle engineering workflow

- > Mechanical
- > Cell to cell communication
- > 3D ECM interaction
- > Fiber alignment



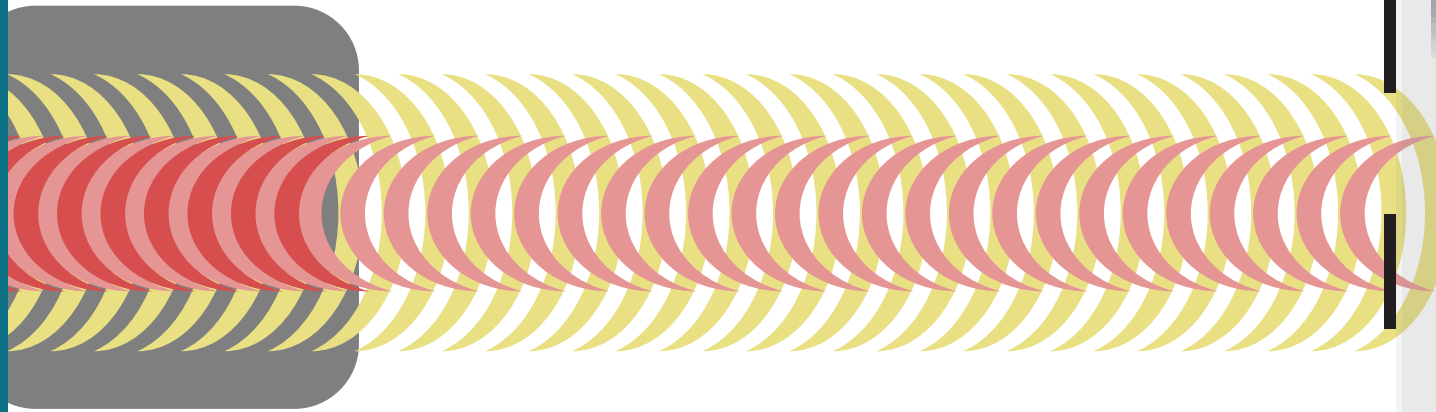
Gain insights on disease with fiber optic sensing technology

Precise absolute force
measurements of
contraction dynamics



Gain insights on disease with fiber optic sensing technology

Precise absolute force measurements of contraction dynamics



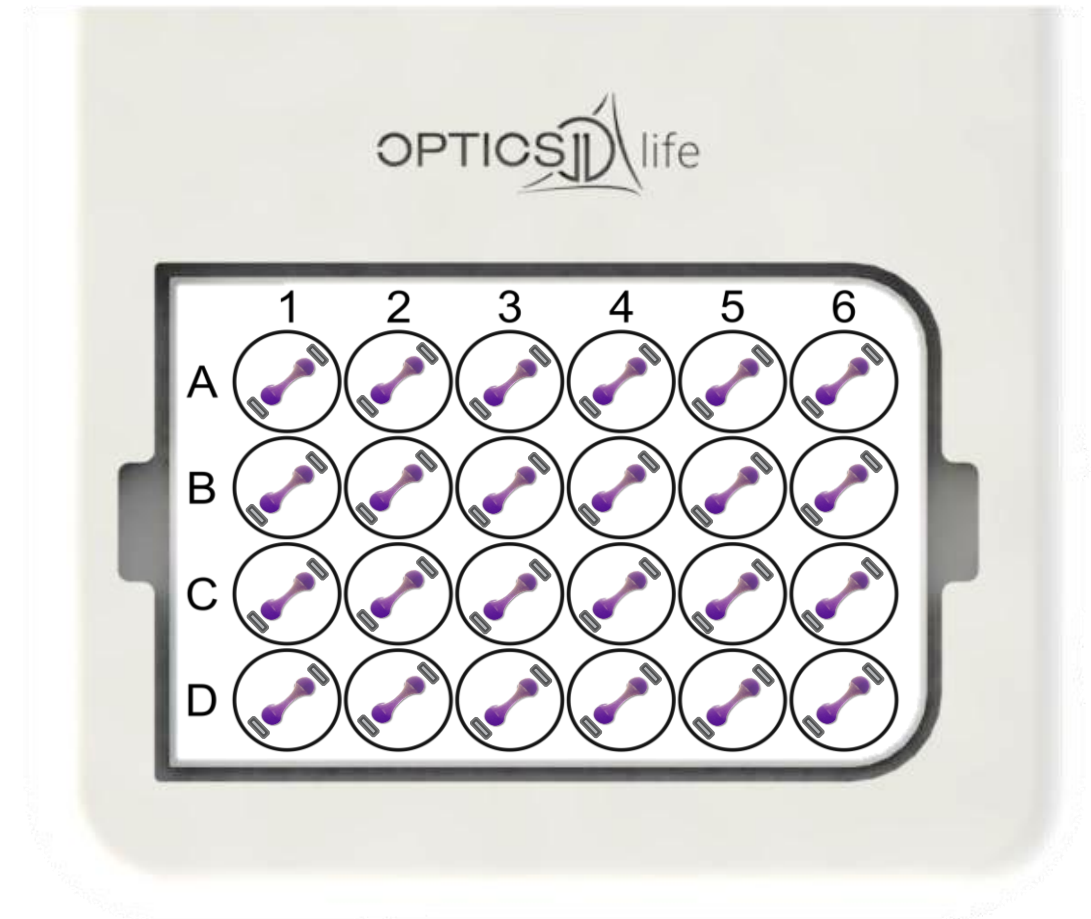
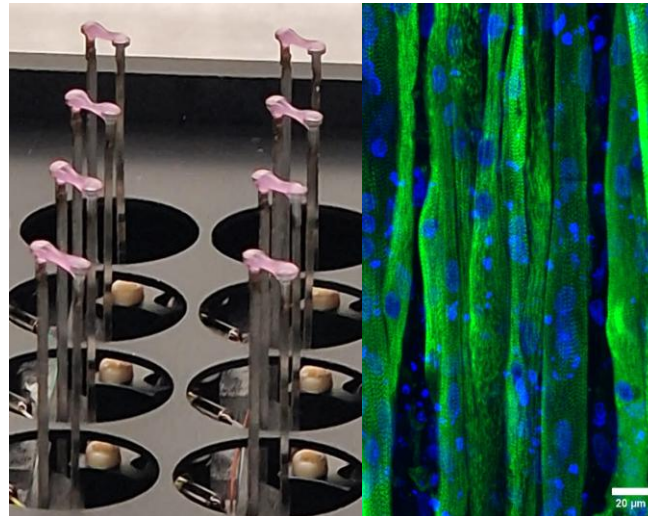
- > Unique fiber sensing technology
- > High sensitivity
- > No microscope required
- > Any incubator

Designed for efficient experimentation

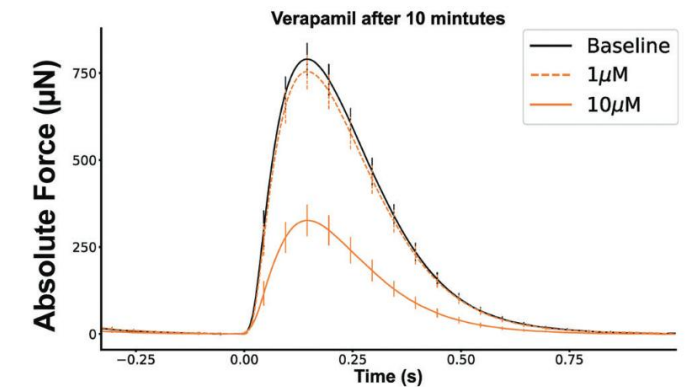
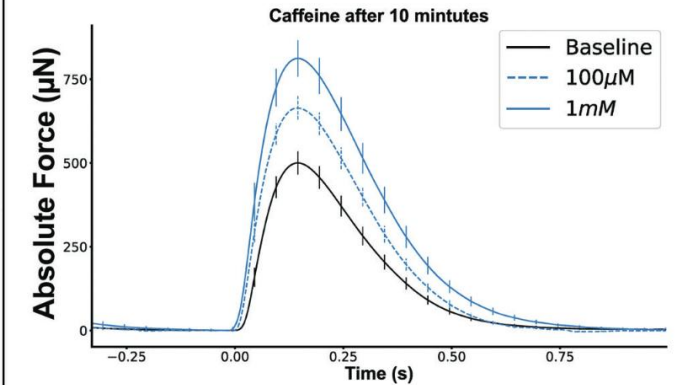
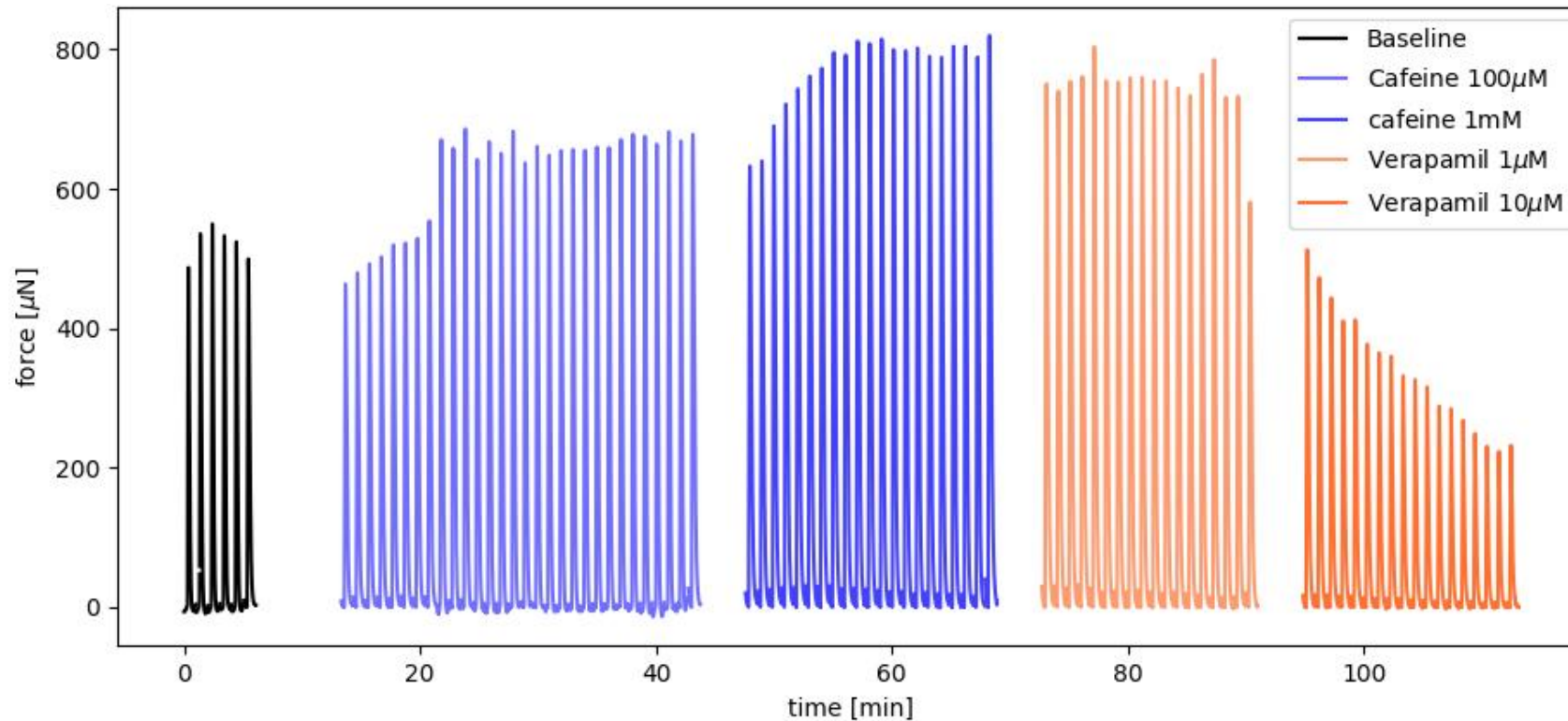
24 Well plate format

Scalable solution

- > Low cell number >500k
- > 24 well format
- > Multiplex the lasers
- > Intergrated electrical stimulation
- > Measurements in incubator



Life-monitoring of drugs and effect on muscle force kinetics





Today:

Research

24 well plate ; 600k cells

charles river

Erasmus MC
Universitair Medisch Centrum Rotterdam



Leids Universitair
Medisch Centrum



Today:

Research

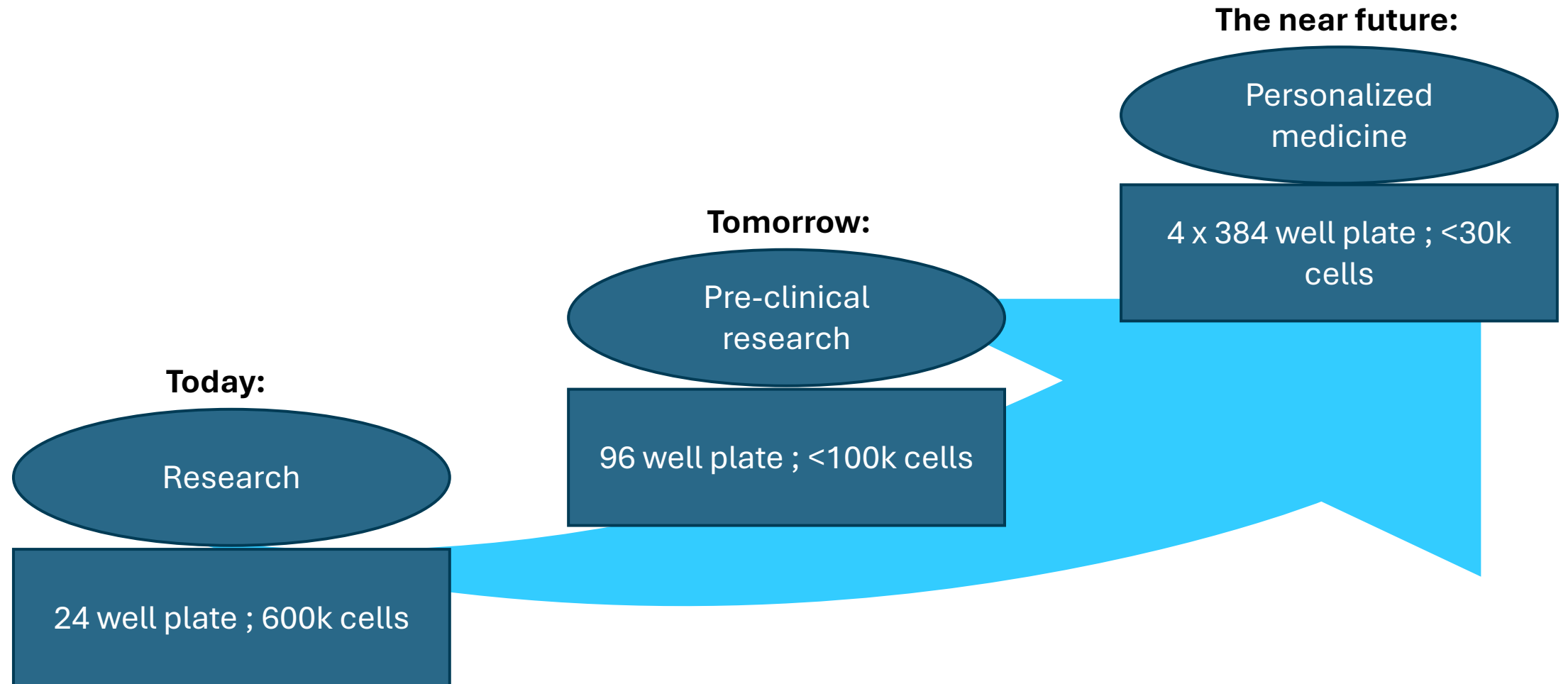
4 x 24 well plate ; 600k cells

Tomorrow:

Pre-clinical
research

4x 96 well plate ; <100k
cells





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