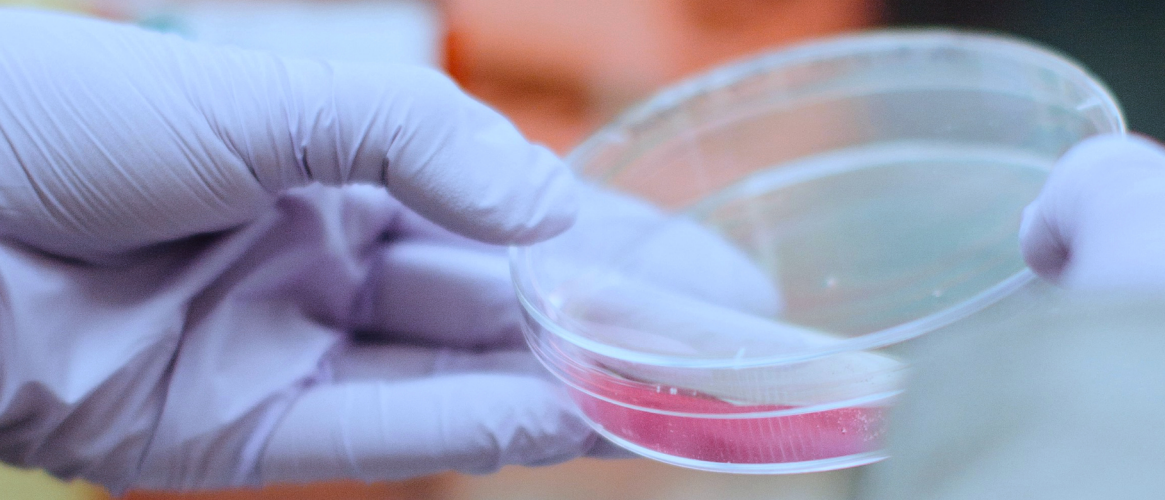




**When  
developing  
drugs  
for humans,  
use human  
platforms**



## Current situation in drug development



Genetic and physiological differences result in limited translatability from animal models. Efficacy and toxicity tests from animals mirror the human reaction by approximately 70% and 50%, respectively.



Preclinical drug development has a high failure rate, is time-consuming, and suffers from constantly rising development costs. This can be traced back to insufficient methods.



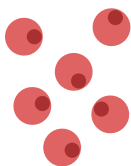
Ethical and public pressure to end animal testing is growing.



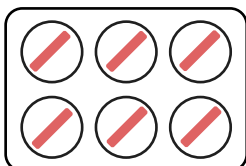
Scientific limitations and ethical problems with animal testing lead to a constantly changing regulatory environment. With the recent signing of the FDA Modernization Act 2.0, the era of mandatory animal experiments is coming to an end.

## From hiPSC-derived cardiomyocytes to relevant data

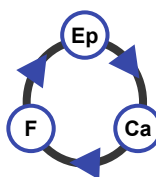
hiPSC-derived cardiomyocytes



Tissue formation in 6-well plate



Measure excitation-contraction-coupling



Data analysis and interpretation



10100010

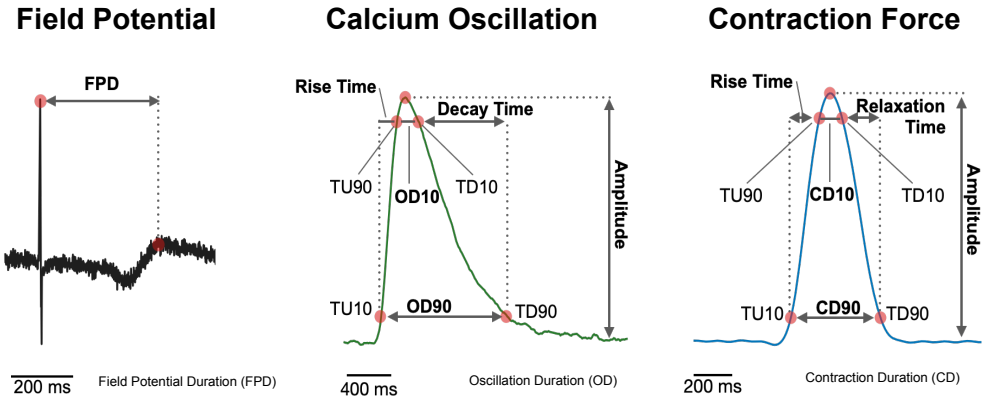
00000001

01101000

**Relevant  
data is the  
key to  
success**

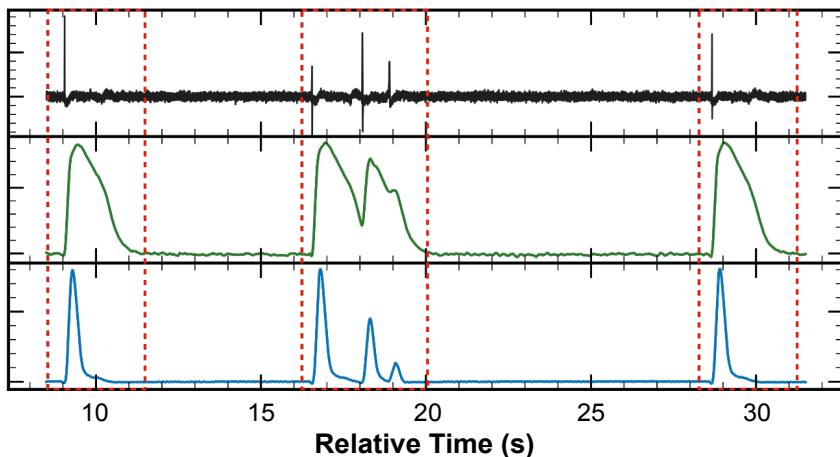


# Analyse excitation contraction coupling with myotwin



Our non-invasive measurement system simultaneously captures field potential, intracellular calcium oscillation, and physical contractions in up to six samples in parallel. This will help you gain a detailed understanding of the impact a novel substance has on the functionality of the human heart muscle.

## Synchronised recordings deliver the full insight



In the example above, the benefits of our approach become obvious. Tracking all three parameters on the same tissue reveals that a hERG channel blocker leads to evident rhythm disturbances across all individual signals. Only the combined measurement will give you the full picture. Noticeable events in the recordings are automatically detected and are analysed in greater depth later on.

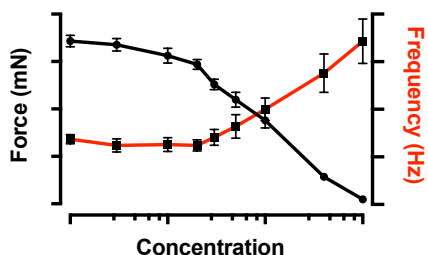
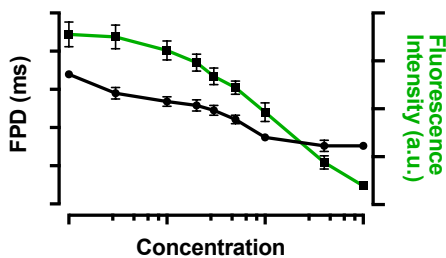
A blue-tinted photograph of a laboratory or industrial setting. In the foreground, there is a complex assembly of white cables and connectors, some labeled with '1000' and '100'. A green fiber optic cable is also visible. The background shows a blurred industrial environment with overhead lights and structural elements. The overall scene is dimly lit, emphasizing the blue color scheme.

**Reduce  
time, risk,  
and cost by  
using our  
high content  
platform**

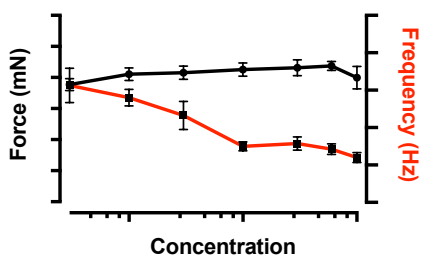
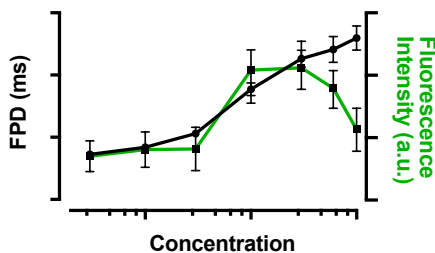
## Responses to cardio active substances

Examples from two validation experiments are showcased below. Both cardio active substances exhibit dose-dependent effects on myocardial tissue samples.

### Nifedipine



### E-4031



The calcium channel blocker Nifedipine hinders the calcium induced calcium release. This leads to an amplitude reduction of intracellular calcium oscillation, ultimately inhibiting contractions.

In contrast, the hERG channel blocker E-4031 extends the field potential duration. This leads to arrhythmias and a decreased contraction frequency.

## Ongoing performance assessment of our approach

- |  |                                      |
|--|--------------------------------------|
| <input checked="" type="checkbox"/> Nifedipine | <input type="checkbox"/> Sotalol     |
| <input checked="" type="checkbox"/> E-4031     | <input type="checkbox"/> Verapamil   |
| <input type="checkbox"/> Quinidine             | <input type="checkbox"/> Isoprenalin |
| <input type="checkbox"/> Moxifloxacin          | <input type="checkbox"/> Sunitinib   |
| <input type="checkbox"/> Blebbistatin          | ... and more                         |



**Contact us**  
and let us know which additional drug responses you would like to see.

**Mimicking  
the  
human  
heart  
is essential  
for high  
translatability**





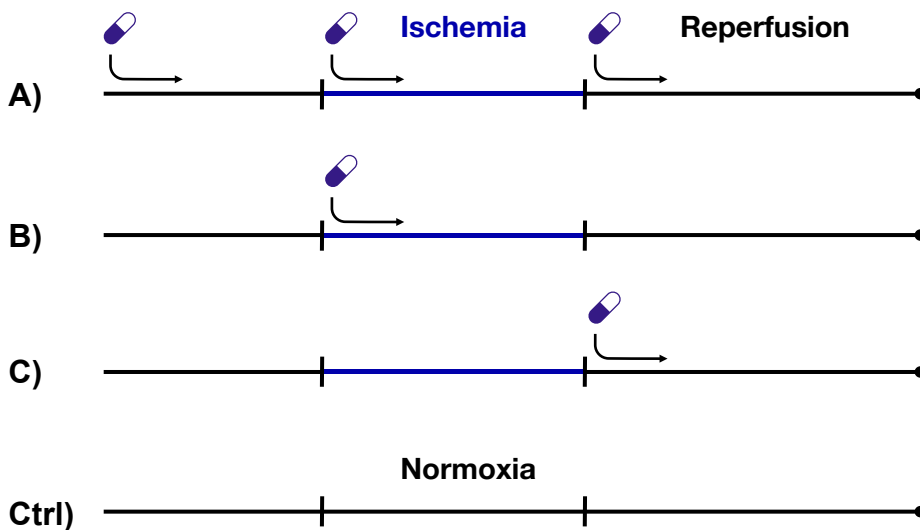
## Mimicking myocardial pathophysiology with myotwin

Optimised maturation protocols are essential to mimic myocardial physiology *in vitro*, return meaningful results, and ensure a higher predictivity. Our heart muscle tissues show the relevant maturity indicators such as positive force-preload relation, positive post-rest potentiation and a positive force-frequency relation.

## Mimicking cardiovascular diseases

With our acute ischemia / reperfusion injury model (heart attack) you are able to test your novel compounds in a A) preventive, B) acute, C) clinically relevant timeframe.

### Simulated ischemia / reperfusion



### Other disease models are also available

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Arrhythmia              | <input type="checkbox"/> Diabetes mellitus            |
| <input checked="" type="checkbox"/> Cardiac hypertrophy     | <input type="checkbox"/> Hyperlipidemia               |
| <input type="checkbox"/> Drug induced cardiomyopathy        | <input type="checkbox"/> Cellular senescence (ageing) |
| <input type="checkbox"/> Genetic disease (Brugada Syndrome) | <input type="checkbox"/> Diastolic dysfunction        |

... and more

A photograph of two scientists, a man and a woman, in a laboratory setting. They are both wearing white lab coats and blue gloves. The man is seated and looking at a microscope, while the woman stands behind him, also looking at the microscope. The background is a blurred laboratory with various pieces of equipment. The overall color scheme is a cool blue.

**Let us  
accelerate  
drug  
development  
together**

## You want to work with us? It's easy!

Our workflow is designed to make experimentation and testing with hiPSC-derived myocardium as convenient as possible.



Contact us



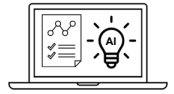
Design experiments



Provide substances

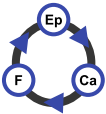


Automated experimentation



AI-based analysis

## Your benefits



Compared to alternative myocardium *in vitro* systems, only myotwin is able to observe the complex interplay of all parameters of excitation contraction coupling in parallel.



Our non-invasive measurements under sterile conditions enable long-term analyses and repeated measurements of the same sample over a desired time period. This provides you with a detailed history of each sample.



The high degree of automation throughout the entire experiment cycle leads to a high reproducibility and a fully automated documentation.

# Want to learn more?



[www.myotwin.com](http://www.myotwin.com)

Supported by:



Federal Ministry  
for Economic Affairs  
and Climate Action

**eXIST**



*Designing.  
The Future.  
Together.*



myotwin GmbH  
Annastrasse 27  
37075 Goettingen  
Germany

on the basis of a decision  
by the German Bundestag