A Beating Human Heart Chamber.

In a Single 384-Well.

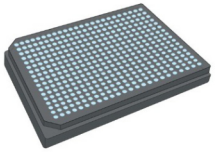
AXOM HARNESS BIOLOGY
EMPOWER DISCOVERY

How is it possible?

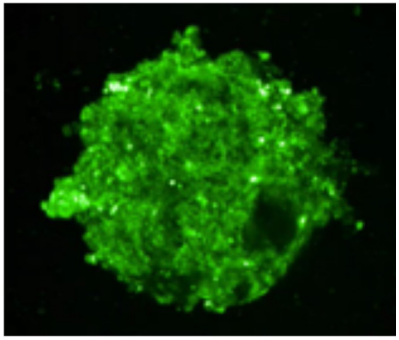
Using **HeartBeat.bio AG's technology,** induced pluripotent stem cells **(iPSCs) can self-organize into complex 3D cardiac structures** known as **Cardioids.**



iPSCs



384-well plate



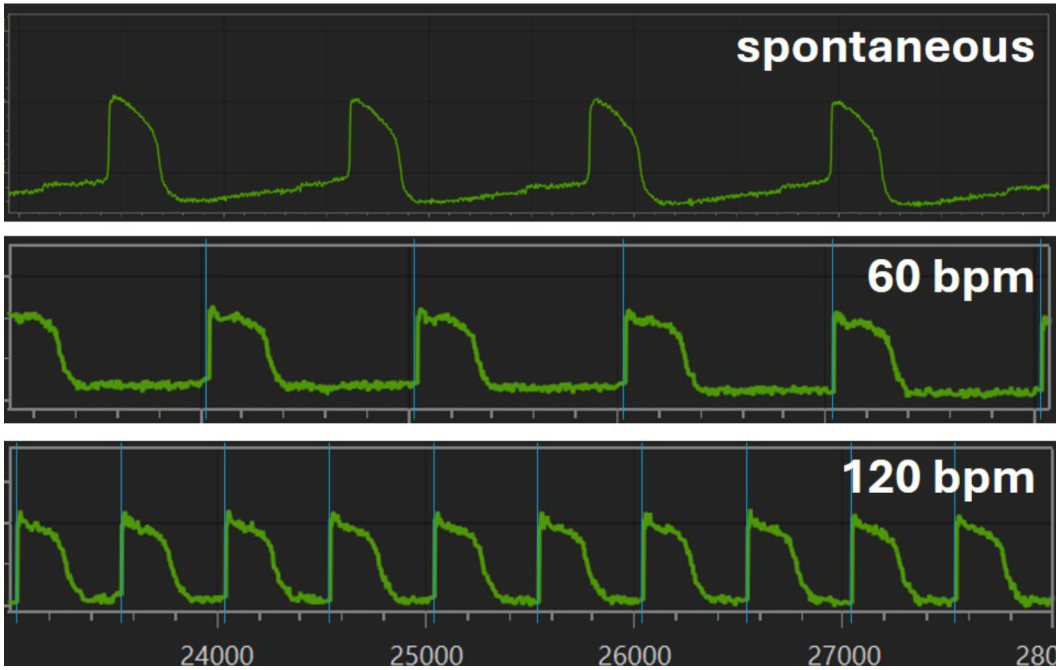
Cardioid
expressing green fluorescent-tagged optogenetic tool

Cardioid:
Ventricle-like, beating chamber with a wall and cavity in a 384-well plate,
mimicking key aspects of human heart development and physiology.

HEART BEAT.bio®
TRANSFORMING CARDIAC DRUG DISCOVERY

Controlling the heartbeat with light

Cardioids were genetically engineered to express a light-activated depolarizing tool, **enabling precise optical control of beating frequency.**



💡 **Light stimulation allows controlled pacing**: from spontaneous activity to synchronized rhythms (e.g. 60–120 bpm)

Can we measure it at scale?

Cardioids were analyzed in a miniaturized 384-well format using Axxam's automated screening platform.

Real-time measurement of:

- **calcium transients**
- **membrane voltage dynamics**

Key signals driving cardiac contractility

3D cardiac models + automated readouts = scalable studies

suitable for early-stage drug discovery

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EMPOWER DISCOVERY

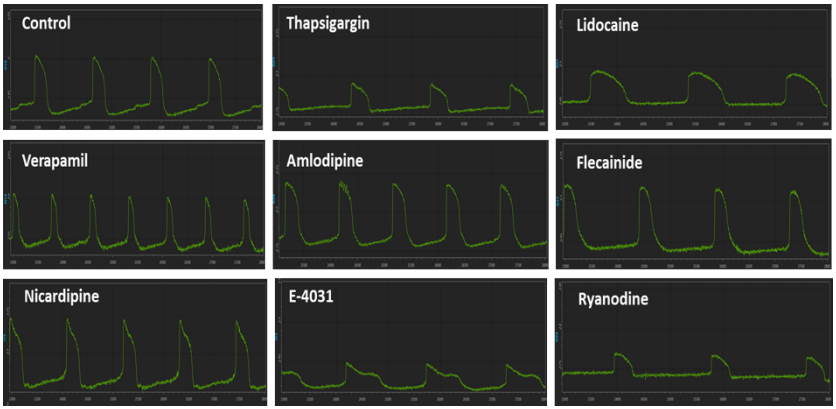
Predicting human cardiac responses

When exposed to known cardiotoxic compounds, Cardioids show **distinct, compound-specific functional changes:**

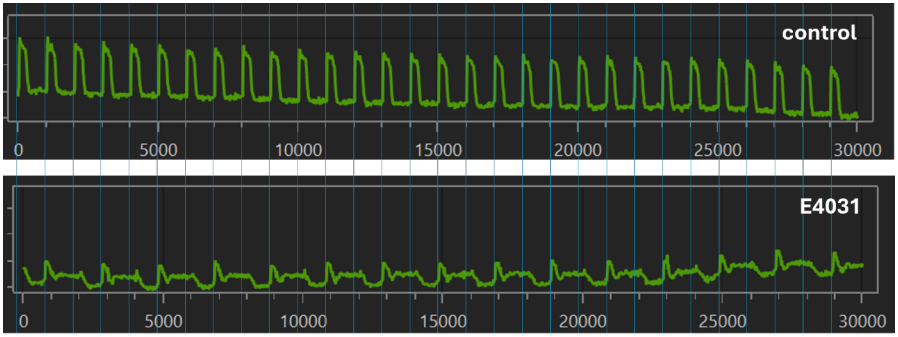
- altered rhythm
- changes in waveform dynamics

Consistent with expected human cardiac responses.

Spontaneous



Opto-paced



Why it matters for drug discovery

Cardiac liabilities remain a major cause of drug failure.

Detecting safety issues earlier means:
reducing risk and downstream costs.

By combining **3D cardiac architecture, optical control of beating and automated functional readouts (384-well),**
Cardioids provide a controlled, reproducible, and human-relevant model enabling:

→ deeper insight into cardiac function
→ earlier detection of safety signals

Better decisions—earlier in discovery.

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Discover how cardiac models from HeartBeat.bio can be integrated into your cardiac safety workflow.

Talk to our experts.

Contact us

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