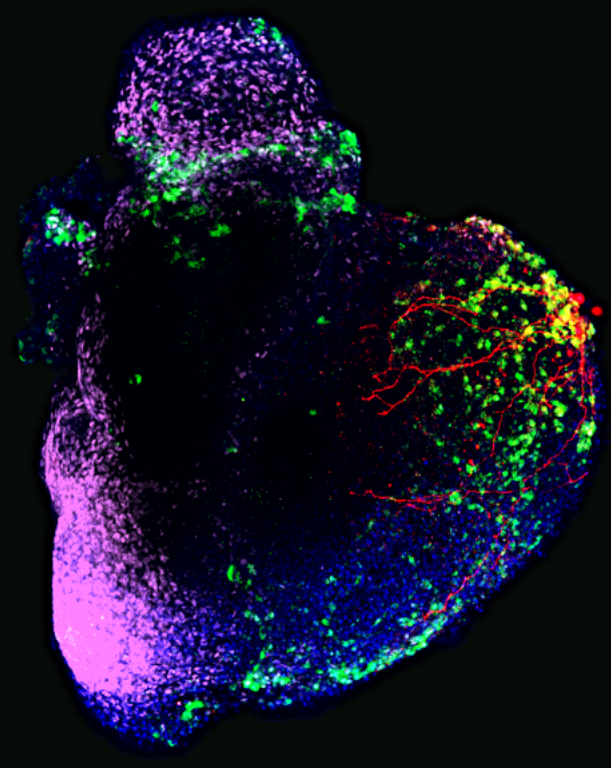
CytoHub

CardioVive™ · human heart tissue

# Human heart tissue with structure and *complexity.*

Beating human heart organoids with chambers, immune and neural cells. Real human data for drug discovery and development.

Studies available now



**96%**
of the cell types found in a human heart

**13**
cell types, including immune and neural

**3**
chamber types: atrial, nodal, ventricular

Applications

## One heart model. Every cardiac question pharma asks.

In paid use

### Cardiotoxicity
Flag cardiac liabilities before first-in-human dosing.

Shown

### Arrhythmia
QT and atrial fibrillation signals from known drugs reproduced.

In paid use

### Immune-cardiac
Inflammation-driven atrial fibrillation with resident macrophages.

Shown

### Congenital defects
Developmental toxicity, such as ondansetron's septal-defect signal.

What we measure

## Five readouts from the same tissue.

### Imaging
Immunofluorescence, live-cell

### Electrophysiology
FluoVolt voltage, MEA, APD30/90

### Contractility
Motion vectors, beat rate, force

### Single-cell RNA · qPCR
Cell types, gene expression

### Bioprocess
0.1–15 L bioreactor, every batch traced

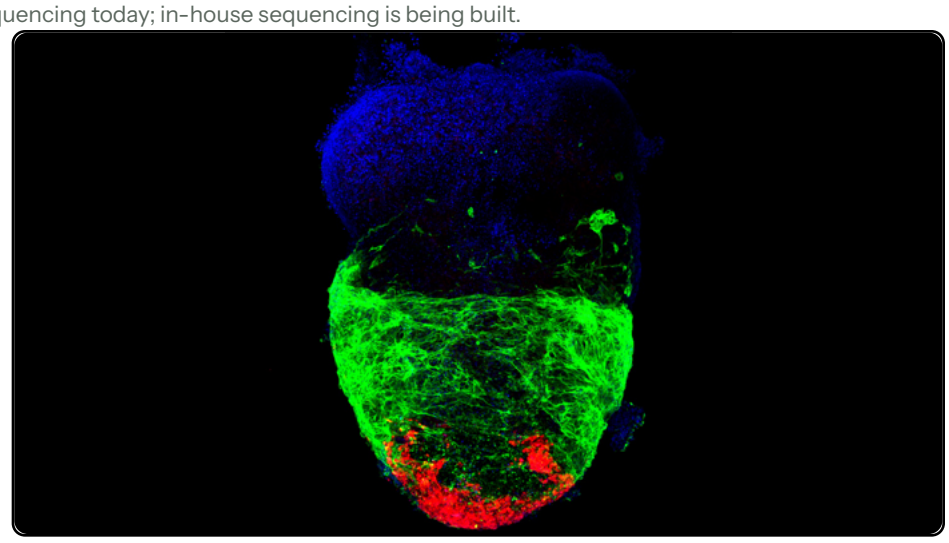
Flow cytometry is also available for cell identity and purity. Single-cell RNA runs on external sequencing today; in-house sequencing is being built.

Built like a human heart

## Real structure, not a flat layer of cells.

Each organoid self-organizes into chamber-like regions with ventricular and atrial cardiomyocytes, conduction-system, endothelial, epicardial, fibroblast, neural and immune cells. One stem-cell line and one protocol: every well beat in a published 96-well batch.

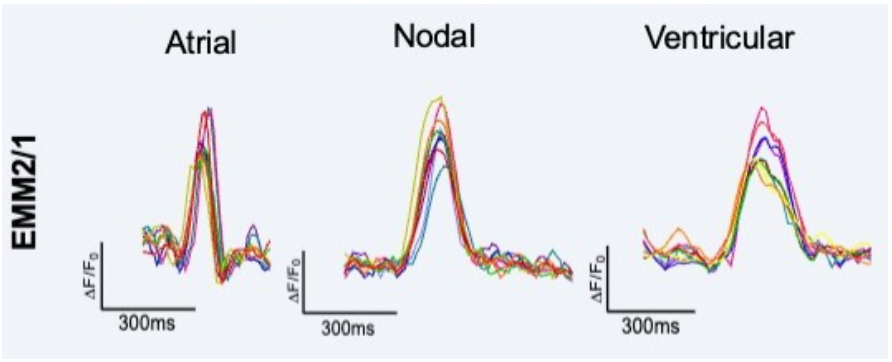
Lewis-Israeli et al., Nat Commun 2021 · Volmert et al., Nat Commun 2023 · O'Hern et al., Cell Stem Cell 2025




**info@cytohub.com** · cytohub.com · 3210 Merryfield Row, San Diego, CA 92121

Electrophysiology

## Read drugs chamber by chamber.




Voltage traces, EMM2/1-matured tissue. Volmert et al., Nat Commun 2023.

Maturation

## Adult-grade electrophysiology.

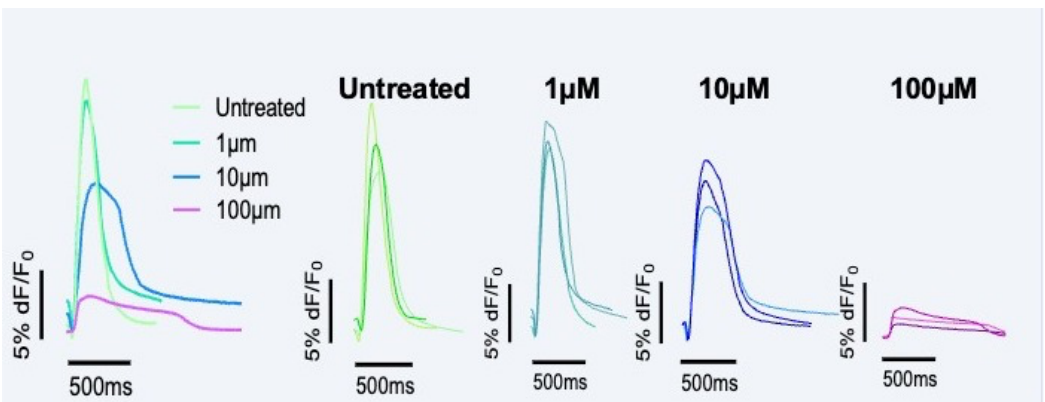
**~2×** KCNJ2, a marker of adult heart rhythm, with our EMM2/1 maturation protocol vs the standard protocol ($p < 0.0001$).

Immature heart cells mislead safety readouts. Maturation brings the tissue closer to the adult heart.

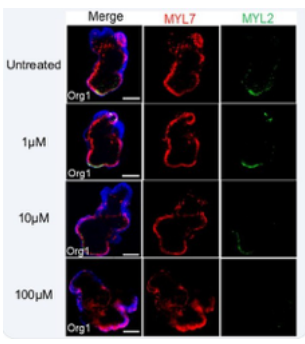
Case study · ondansetron (Zofran)

## The dish matches the clinic.

Ondansetron carries clinical warnings for QT prolongation and septal defects. In our founding lab's published work, the tissue showed signals consistent with both, dose by dose.




**APD ↑** Action potentials lengthen with dose ($p < 0.001$), consistent with the QT warning.



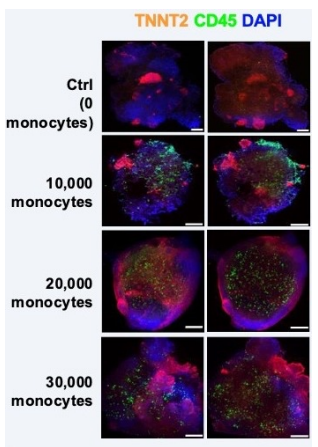

**MYL2 ↓** Ventricular marker falls with dose; MYL7 stable.

Immune-cardiac · a heart immunoid

## Cardiac safety needs the immune system.

- ✓ **Autologous.** Heart and immune cells from one stem-cell line.
- ✓ **Integrated.** Macrophages settle throughout the tissue and stay.
- ✓ **Functional.** Inflammation triggers NLRP3-driven atrial arrhythmia.
- ✓ **Tunable.** More monocytes in, more tissue macrophages.

O'Hern et al., Cell Stem Cell 2025 and 2026. Like all immunoids today, CardioVive is partly immune-competent; more immune cell types are next.




Ways to work with us

Available now

### Studies

Functional cardiac data on your compounds, with a report per compound.

Coming next

### Data partnerships

Studies plus single-cell sequencing to show the mechanism behind each change.

In development

### Model access

CytoHub.AI models for in-silico questions.

## Start with a pilot on your compounds.

Your compounds and results stay confidential.

info@cytohub.com

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