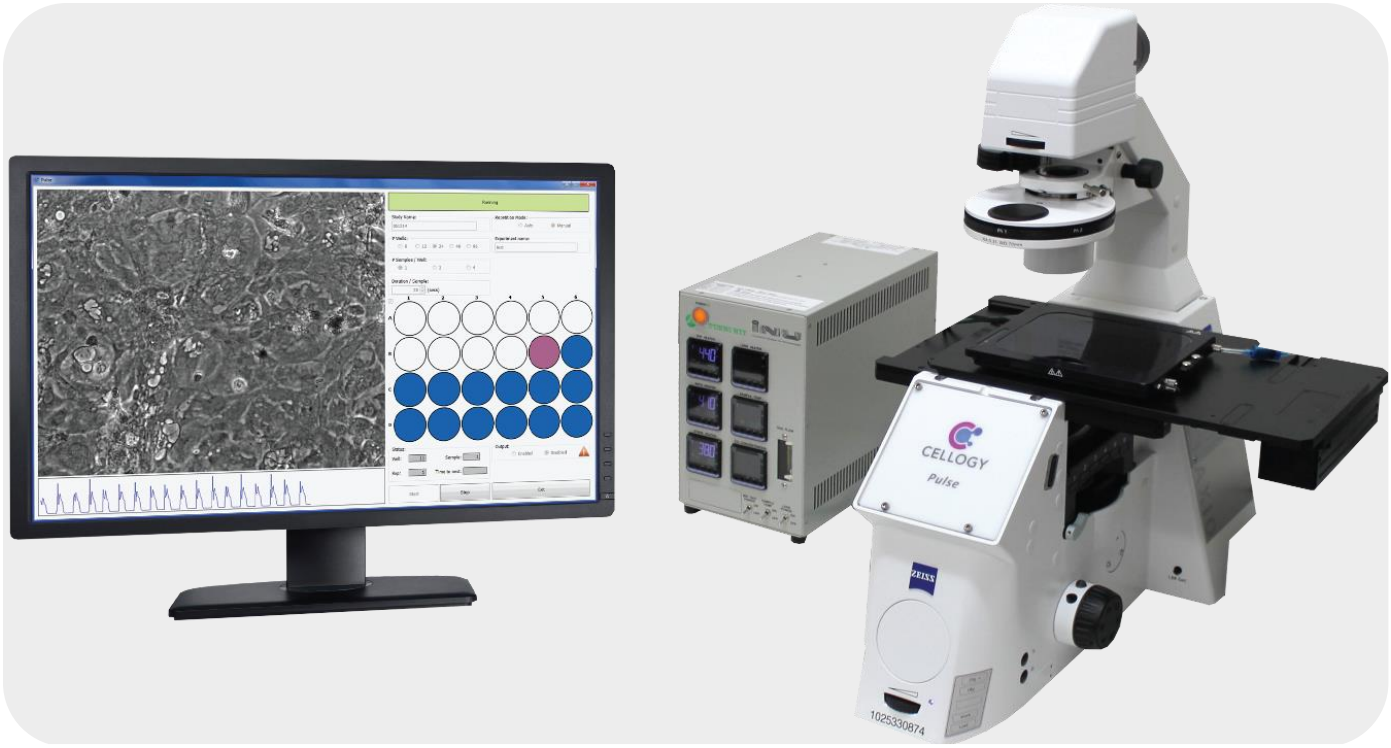
PULSE

Label-free, Contact-free Cardiomyocyte Beating Assay



CELLOGY

Overview

Accelerate your cardiomyocyte research with Pulse

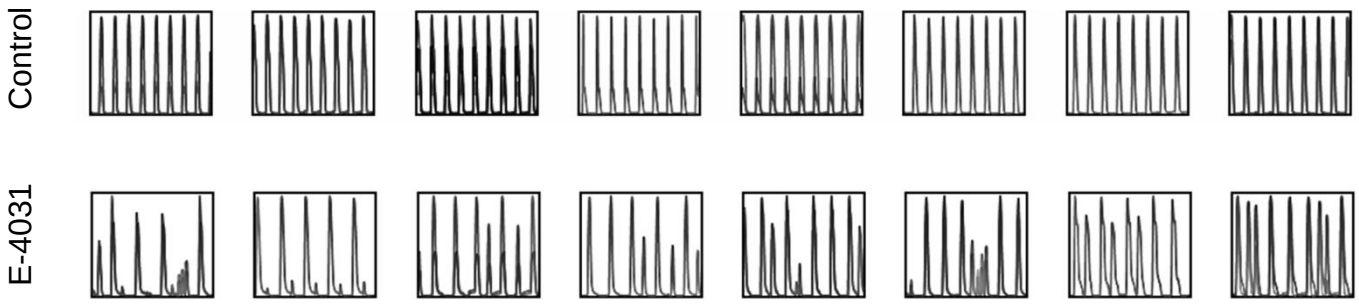
Pulse is an automated, non-invasive system for characterizing the function of stem cell-derived cardiomyocytes based on video microscopy and image analysis.

Pulse makes your analytical studies of stem cell-derived cardiomyocytes easy

- **Automated measurements**: Pulse generates measurements of beating frequency, variation, duration, and magnitude based on video motion analysis.
- **Cell and workflow friendly**: Use standard 6-well through 96-well plates. No dyes, no electrodes. Nothing touches your cells except the compounds you'd like to test.
- **High-density or single-cell**: Plate your cells however you'd like, and Pulse will automatically generate measurements for each distinct beating cell or group of cells.
- **Configurable and automated**: Run the assay once, or tell Pulse to assay every 30 minutes for the next 8 hours. Load your plate, press start, and your results will be waiting for you.

Quickly and easily measure drug induced changes to cardiomyocyte function

Pulse is an ideal screening tool that can be used to efficiently and cost-effectively scan large numbers of compounds for cardiotoxicity and interrogate physiologically relevant phenotypes.



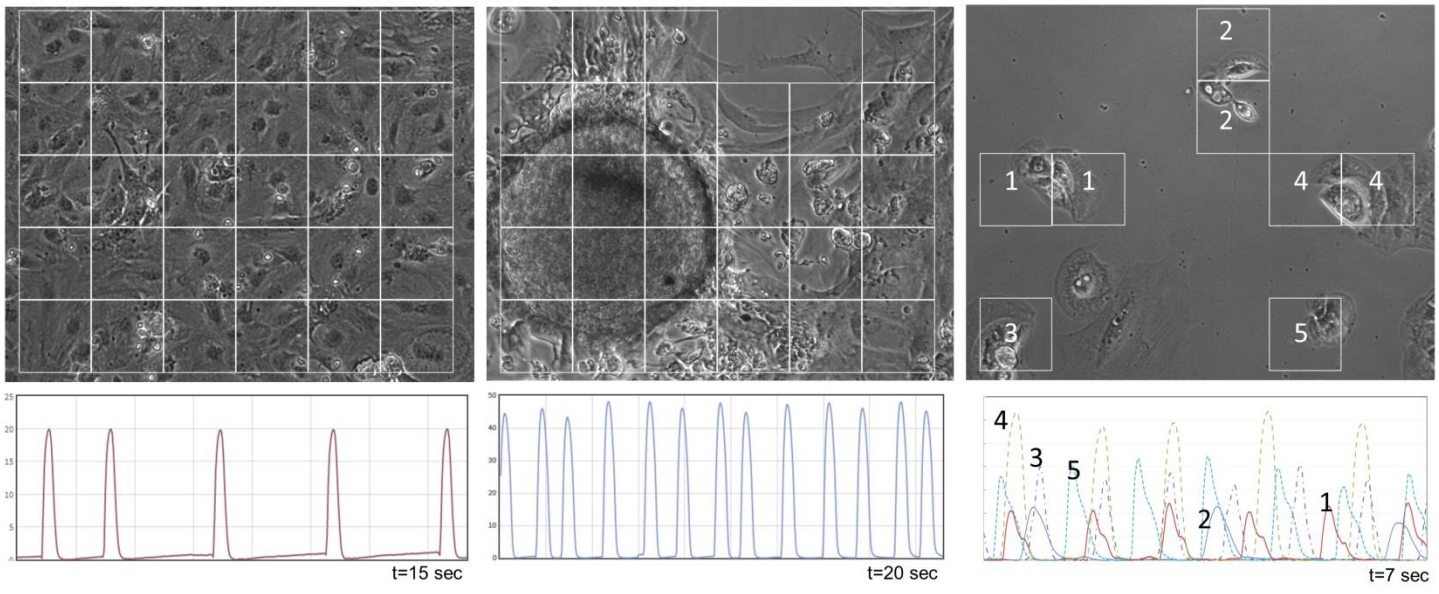
How It Works

Pulse is designed to analyze cardiomyocytes seeded at low density, in a monolayer, or in 3D culture format without additional input or parameter modification from the user.

This is achieved through the following steps:

- Block-wise segmentation of the image sequence.
- Extraction of the beating signal for each block.
- Quantification of the beating signals.
- Outlier rejection.
- Clustering of the beating signals into a set of unique signals, each representing a region of the culture where cardiomyocytes beat in synchrony.

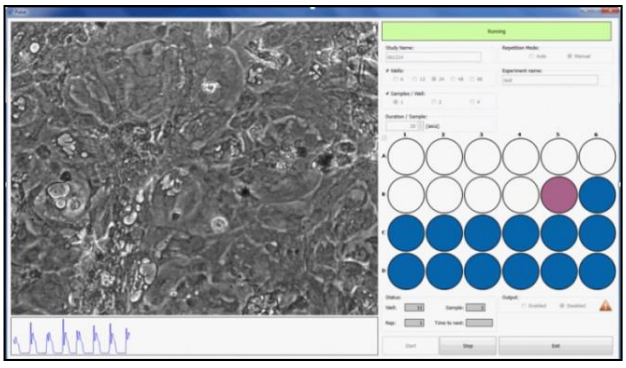
Monolayer **Tissue and Spheroids** **Single-Cell**



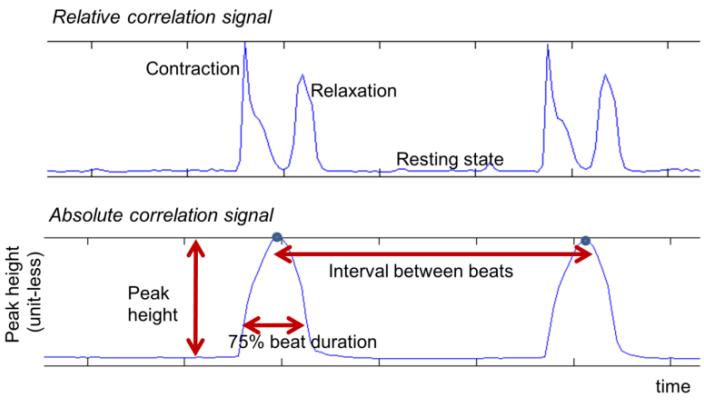
Specifications: Software

Pulse Software	
System Software	Primary software application for running an experiment and analyzing results.
Multimedia Output	▪ Raw Image Sequence in JPEG format ▪ Movies in AVI, MP4, and WEBM formats
Analysis Output	CSV spreadsheet containing: ▪ *Relative Correlation Signal:* Time-series data of relative motion between frames. Typically shows distinct peaks for contraction and relaxation. ▪ *Absolute Correlation Signal:* Time-series data of motion relative to a global reference. Used for all parameter measurements. ▪ *Beat Rate:* Reported in beats per minute. ▪ *Beat Rate Variation:* Standard deviation of beat intervals. ▪ *Beat Duration:* Measured at 25% of peak height, reported in seconds. ▪ *Peak Height:* Unit-less measure of contractile strength. ▪ *Peak Height Variation:* Standard deviation of peak heights. Provides a measure of beat-to-beat variability. ▪ *Prevalence:* Percentage of beating cells relative to image area.

System Software UI



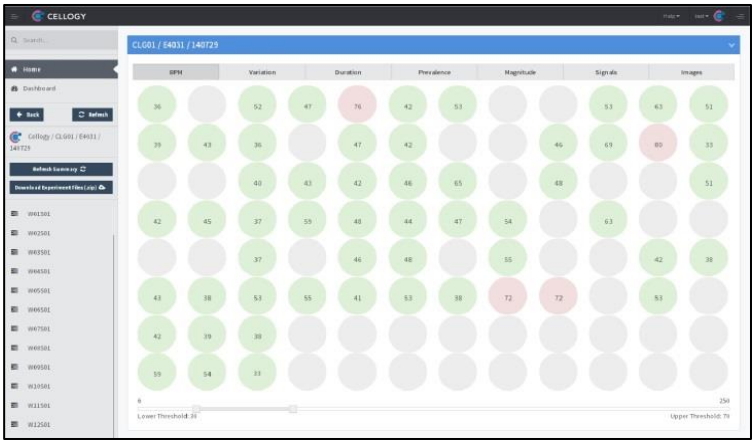
Analysis Schematic



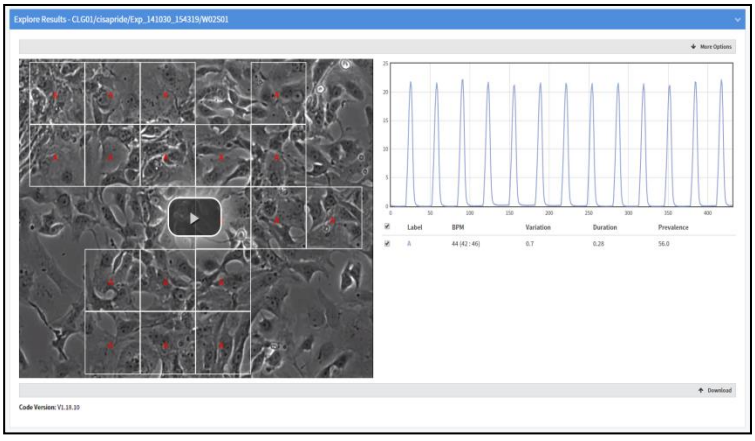
Specifications: Cloud-based service

Cloud-Based Software	
Upload Software	Stand-alone application that runs automatically to upload data and analysis output to the cloud.
Website Software	Website application that allows the user to access data and analysis output. ▪ Secure site with password-protected user login ▪ View and download images, movies and analysis output ▪ Dynamic color-coded dish view of measurements ▪ Unlimited data storage ▪ Compatible with Chrome, Firefox, Safari and IE ▪ Accessible from any computer or mobile device

Web Application Dish View

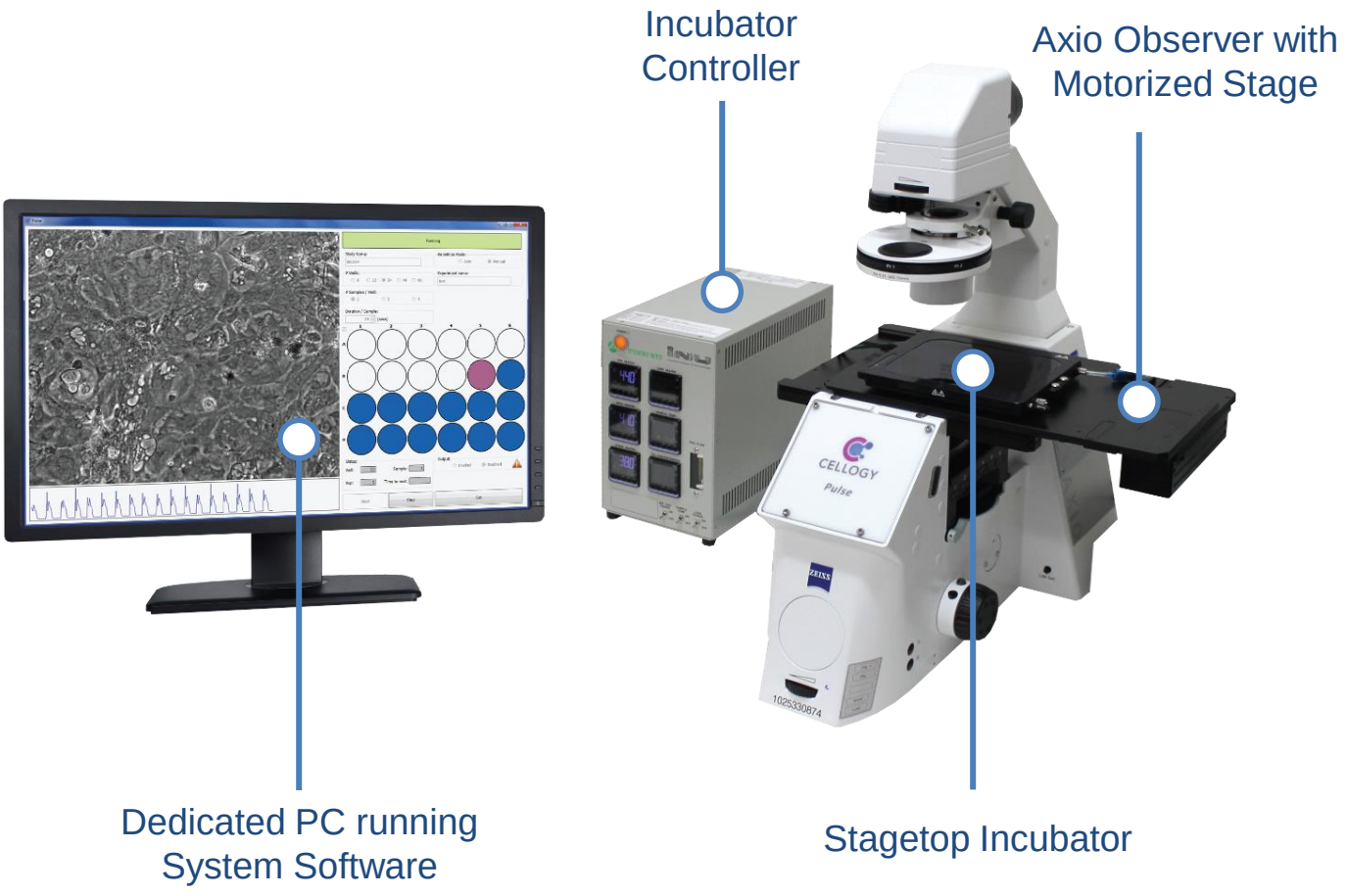


Web Application Sample View



Specifications: Hardware

Pulse Hardware	
Microscope Body	Zeiss Axio Observer Z1
Objective	10X Phase Contrast
Camera	Pixelink PL-D721MU
Default Frame Rate	24 frames/sec
Stagetop Incubator	Tokai Hit WSKM
Computer	Dedicated PC with Windows 7



PULSE

Pulse is for Research Use Only

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