AXION BIOSYSTEMS

pluriomics

E-STIM+ CLASSIC MEA 48

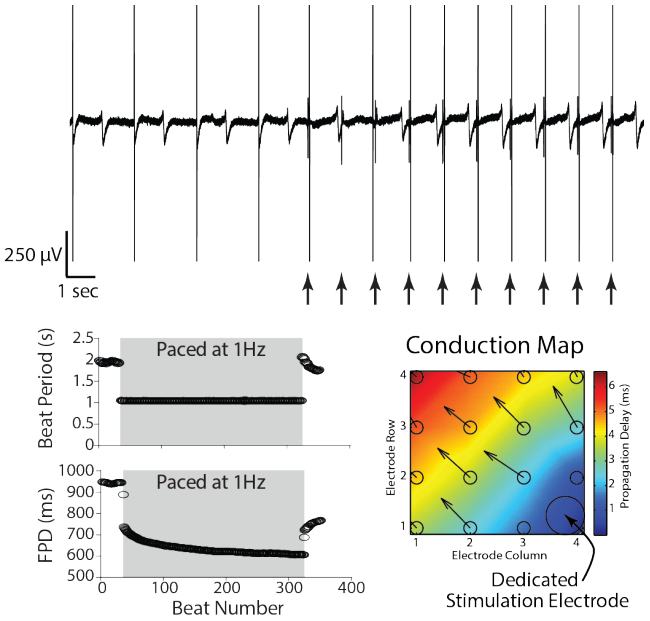
TAKE CONTROL OF YOUR CARDIAC ASSAY

Advantages of electrical stimulation

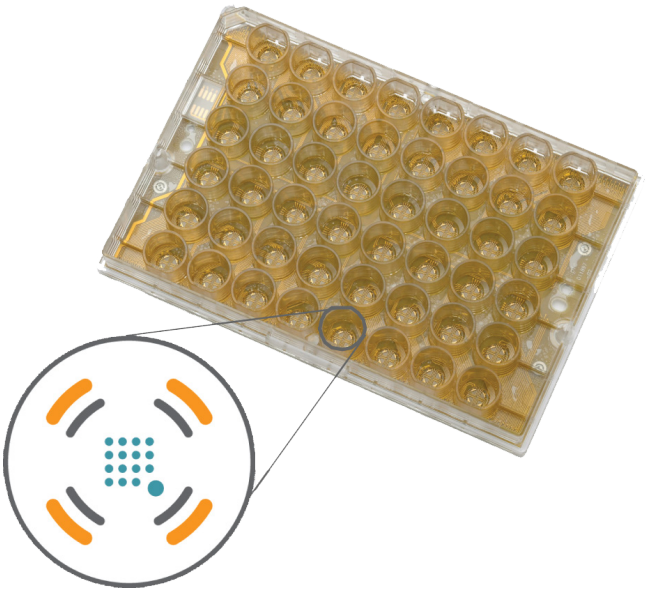
Cardiomyocytes cultured on microelectrode arrays (MEAs) create an accessible platform for studying heart-beats in a dish. These assays rely on evaluation of parameters, such as repolarization timing, that are tightly coupled to beat rate. Controlling beat rate increases physiological relevance and reduces well-to-well variability. Furthermore, systemically varying beat rate enables detection of use dependent (i.e. beat rate dependent) drug effects.

Superior stimulation capacity

Axion BioSystems' new E-Stim+ Classic MEA 48 plate delivers high-quality MEA results with superior stimulation capacity. The large dedicated stimulation electrode ensures reliable stimulation capture. Seamless integration with AxIS makes stimulation simple yet customizable. Optimized artifact elimination and automated detection of electrophysiological features make analysis efficient and reproducible.



Pacing stimuli set beat rate at 1Hz (top, arrows). Beat period and field potential duration quickly adapt (bottom left). AxIS quantifies key parameters, such as conduction, with real-time visualization (bottom right).



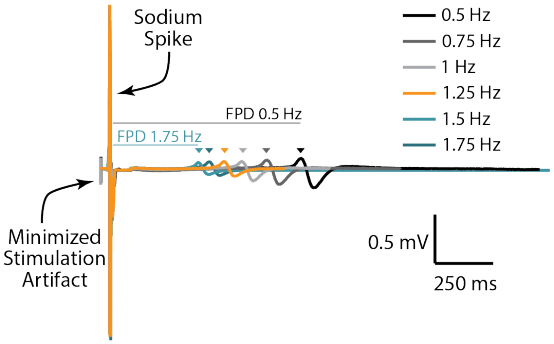
E-Stim+ Classic MEA™ 48 plate (M768-KAP-48S). (Inset) Schematic of well illustrating large dedicated stimulation electrode and recoding electrodes (blue), AccuSpot on-plate spotting guides (gray), and grounds (orange).

THE E-STIM+ ADVANTAGE

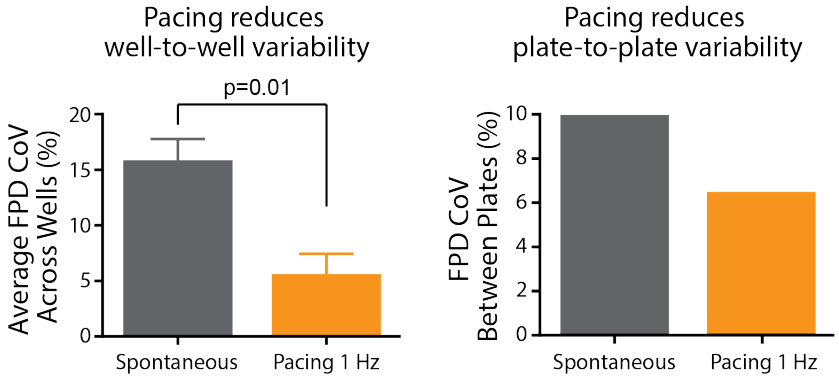
- Large dedicated stimulation electrode for reliable stimulation capture
- Seamless integration with AxIS software for optimized artifact elimination and automated detection of electrophysiological features
- Specify beat rate for enhanced physiological relevance
- Establish well-to-well and assay-to-assay consistency
- Directly assess use dependent drug effects for superior safety screening

IMPROVE THE QUALITY AND CONSISTENCY OF YOUR ASSAY

Compound-induced changes to hiPSC-cardiomyocyte field potential duration can be used as an indicator for assessing the cardiac safety profile of new drugs. However, beat rate variability between wells and replicate assays can confound data interpretation. The ability to pace hiPSC-cardiomyocyte activity reduces both well-to-well and between assay variability.



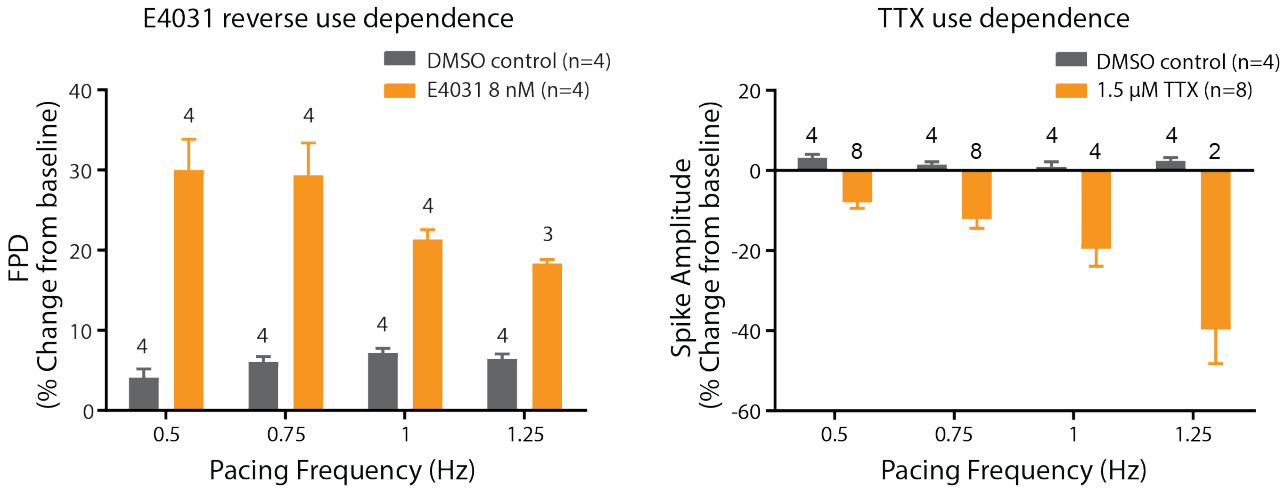
The field potential duration (FPD) of Pluricyte® Cardiomyocytes (Pluriomics) decreases in response to increasing pacing rates on the E-Stim+ Classic MEA plate.



Pacing Pluricyte® Cardiomyocytes with the E-Stim+ Classic MEA plate significantly reduces well-to-well variability in field potential duration (FPD) (p=0.01) as well as variability between plates. Variability was measured as the coefficient of variation (CoV) across wells (left) and across plates (right).

DISCOVER MORE FROM YOUR ASSAY BY CONTROLLING ACTIVITY

Many compounds exhibit use dependent effects. Reverse use dependence, which occurs when a compound produces greater effects at slower beat rates, is an important indicator of proarrhythmic risk. The E-Stim+ Classic MEA 48 plate allows the user to systematically vary beat rate to identify such use dependent effects. Thus, pacing with the E-Stim+ Classic MEA 48 plate significantly increases the information content of your assay. The relatively low spontaneous beat rate of Pluricyte® Cardiomyocytes (<0.5 Hz) is advantageous, as it enables pacing across a wide range of beat rates.



(Left) Reverse use dependence of E-4031, a hERG potassium channel blocker, revealed by pacing Pluricyte® Cardiomyocytes on the E-Stim+ Classic MEA 48 plate. (Right) Use dependence of TTX, a sodium channel blocker, revealed by pacing Pluricyte® Cardiomyocytes on the E-Stim+ Classic MEA 48 plate. (Both) Bars represent mean ± 1 standard error of the mean. Numbers above the bars indicate the number of wells successfully paced.

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