

HyperCAM Alpha



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Alpha : the dawn of a new era in multiwell functional screening

3Brain revolutionizes functional screening assays with HyperCAM Alpha, the first multiwell system based on the Coreplate™, a radically new technology making use of processing microchips integrated in each well to transform standard cell culture plastic plates into intelligent devices.

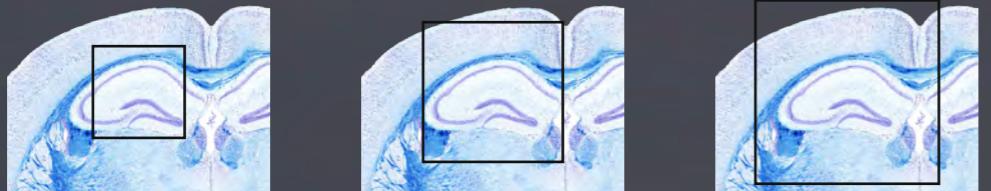
With its thousands of sensing and actuating electrodes per-well, HyperCAM Alpha is the most advanced, precise, and reliable solution to monitor and stimulate several *in vitro* models: human iPSC-derived neurons, dissociated murine cultures, acute brain and cardiac tissues, complex 3D neuronal assemblies, spheroids or brain/cardiac organoids.

This is CorePlate™: 6 wells x 4096 sensors

Thanks to the CorePlate™ technology, HyperCAM Alpha can record from up to 13824 sensors over 6 independent wells simultaneously (2304 electrodes/well).

Whether you need to focus on small areas or to monitor larger portions of your samples, Alpha provides you the maximum flexibility for your assay's needs with different spatial recording configurations selectable.

Large brain tissues, dense or sparse human derived neuronal networks, spheroids or organoids of any dimension always fit with the recording capabilities of Alpha.



1024 el.

60 μ m pitch

1.9 x 1.9 mm² area



2304 el.

60 μ m pitch

2.9 x 2.9 mm² area



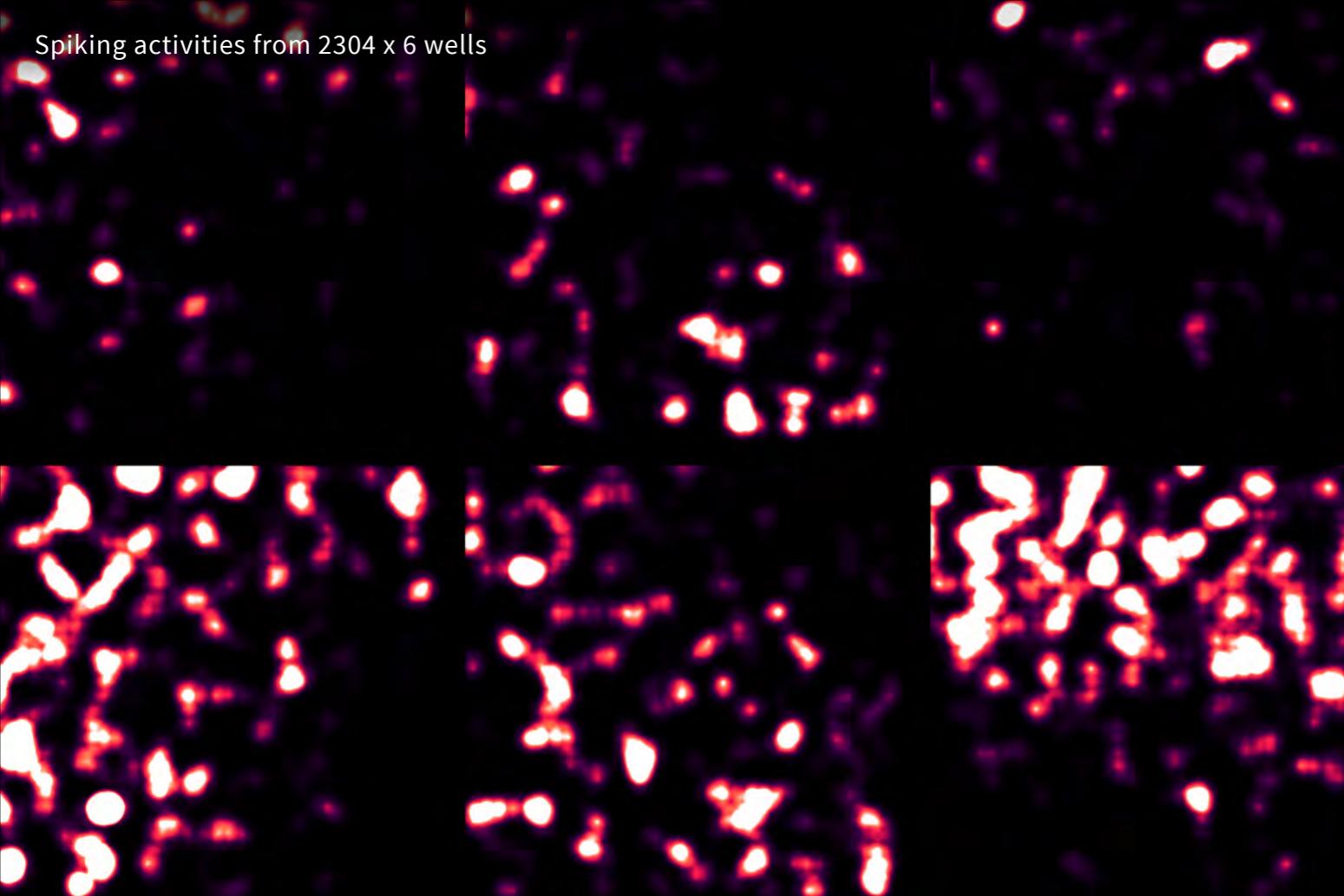
1024 el.

120 μ m pitch

3.8 x 3.8 mm² area



Spiking activities from 2304 x 6 wells



Firing distribution from two different cell populations



No compromise on data quality

Alpha's state-of-the-art hardware technology, combined with the latest generation of our BrainWave software, makes it easy to process the large amount of data generated in a few clicks. Information from wells and well groups can be combined, filtered, browsed and visualized in a variety of ways to get the most accurate picture of your cell preparation.

Furthermore, the high statistical quality of the data generated in each well reduces the overall need for replicates, simplifying experimental assays and reducing costs and time-to-results.

One system, multiple uses

The versatility of Alpha makes the system ideal for any kind of experiment. The environmental chamber housing the CorePlate™ multiwell can operate in the closed-lid configuration to provide a space where temperature and CO₂ saturation can be controlled and humidity monitored, ensuring ideal conditions for long-term kinetic assays on cell culture models.

The open-lid configuration allows for the integration of fluidic systems and acute tissue measurements. Besides, the incubation chamber is sealed to protect the instrument's electronics from accidental spill-out or experimental misuse.

Alpha has also stimulating capabilities: with its two independent channels, the system enables designing complex experimental paradigms such as Long Term Potentiation or Paired Pulse protocols.



HIGHLIGHTS

Unrivalled performances on a 6-well device

2304
max recording channels per well

20 kHz/electrode
@1024 electrodes per well

Temperature and CO₂,
active control

Touch screen
for a quick access to the main controls



4096
stimulation sites per well

1.5 GHz
ARM® dual-core Cortex™

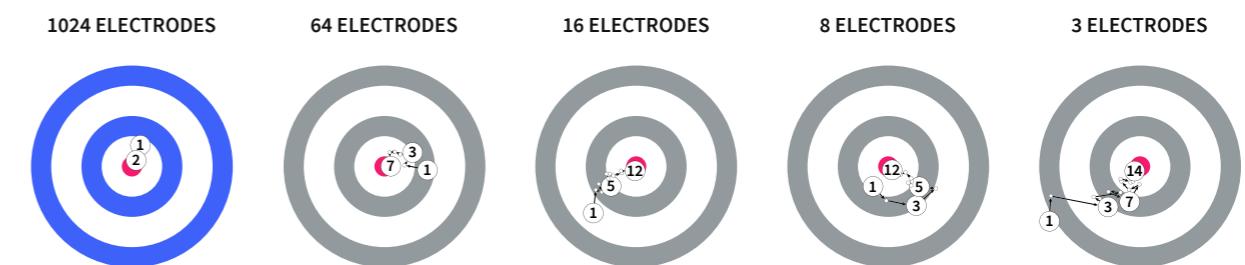
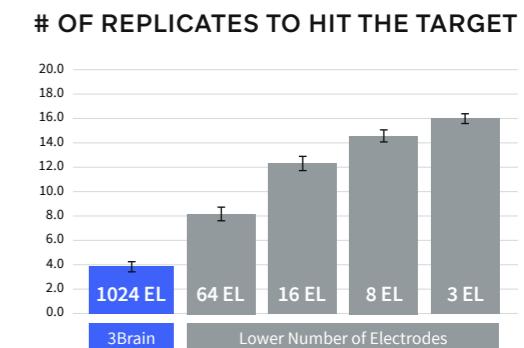
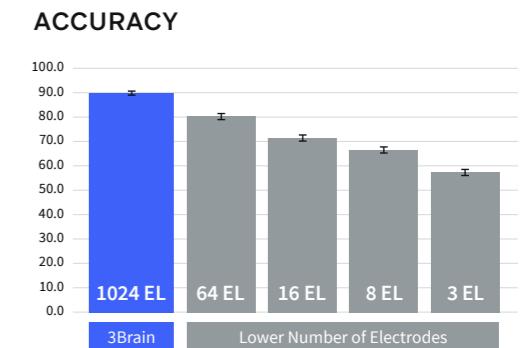
Spill out protection
with water-proof chamber

USB-C
data interface

Get to your results 4 times faster!

HyperCAM Alpha, with up to 2304 electrodes per well, provides experimental reliability and reproducibility that far exceed what can be achieved with standard multiwell MEA platforms, which use only a few electrodes per well.

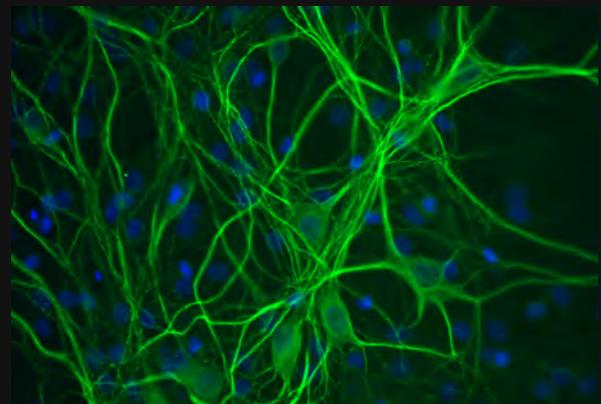
The highly informative recordings obtained with HyperCAM Alpha allow you to fully exploit your biological model by increasing precision and accuracy. The number of replicates required to reach stable results ("hit the target") is reduced by a factor of 4, with considerable time and cell/reagent savings.



HyperCAM Alpha performances compared with lower electrode number configurations. Accuracy and number of replicates to reach stable results are extracted by averaging results from 12 different datasets. Accuracy in evaluating basic metrics (e.g. neuronal firing rate) improves significantly with 1024 el. and, at the same time, the number of replicates required to reach stable results is reduced by ~4 times. Target charts show an example of the number of required replicates for one experiment. Successive replicates are added to the pool of data to evaluate the metrics and the added number of replicates is indicated on the targets. Lower electrode density configurations require more replicates (e.g., 14 replicates for 3 el. config.) than higher density ones (2 replicates for 1024 el.; 2304 not shown).

APPLICATIONS

Human derived and dissociated cell culture studies with unmatched details

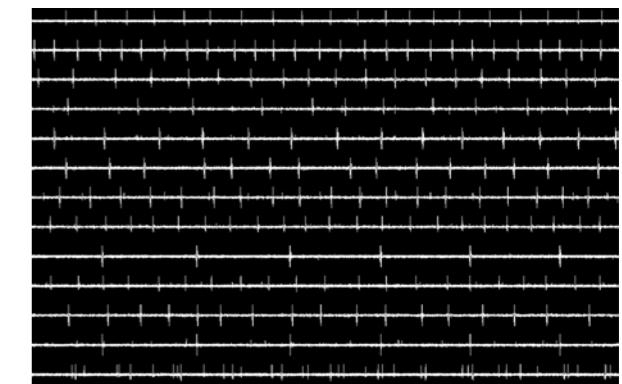
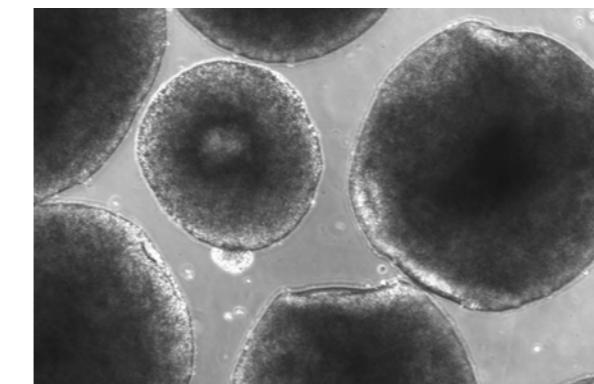


HyperCAM Alpha allows label-free functional monitoring of large neuronal networks with single-cell spiking activity resolution. This is the most advanced technology to study physiological and pathological neuronal conditions, to decode mechanisms of signal processing and to improve the quality and reliability of drug screenings or toxicological assays.



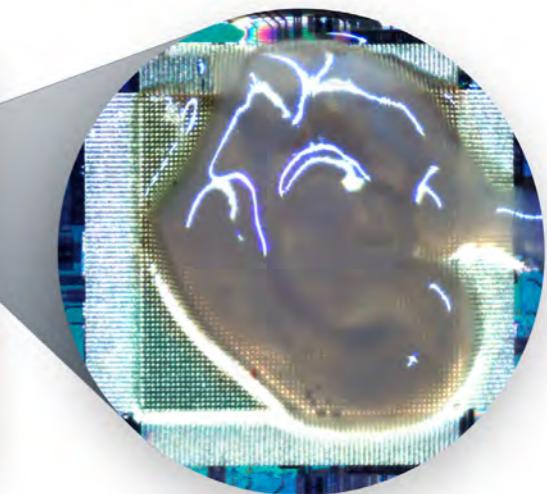
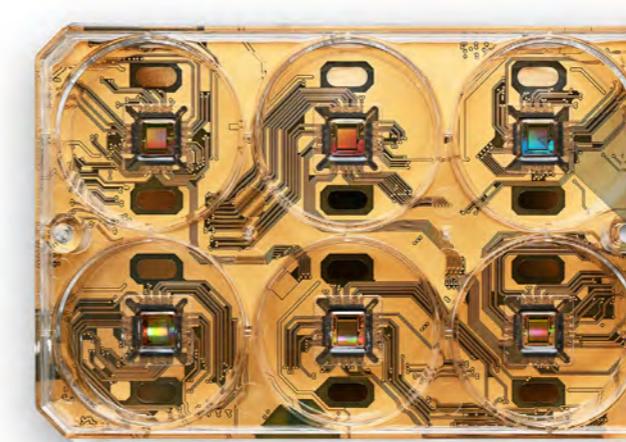
Deep investigation of brain spheroids and organoids

3D structures of almost any size and dimension can be easily positioned on the 6-well CorePlate™ sensors for long term activity monitoring and screening assays. No matter how complex your model is, you will not lose any detail of its spontaneous or electrically evoked activity.



Up to 6 brain slices in parallel

HyperCAM Alpha is the first multiwell system designed to work with acute brain slices requiring the use of a fluidic system. In the open-lid configuration, HyperCAM Alpha allows the parallel monitoring of up to 6 slices. LTP/LTD protocols are handled by an upgraded version of EVOS, a module of our BrainWave software specifically designed to automatize such studies.



DESIGNED IN SWITZERLAND. MADE IN EUROPE.



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