

Unveiling a next-generation imaging system with deep learning technology

The ImageXpress Confocal HT.ai High-Content Imaging System combines premium hardware technology with a self-learning software analysis workflow for increased signal and ultra-fast 3D organoid screening.

MOLECULAR DEVICES, a leading provider of high-performance life science technology, has globally launched its next-generation, high-content imaging system. Built on the success of the company's flagship model, the ImageXpress Confocal HT.ai High-Content Imaging System is designed to help researchers advance phenotypic screening of three-dimensional (3D) cell models, such as organoids. The new system offers faster image acquisition and multiplexing flexibility with high-performance lasers. Image analysis with machine learning enables researchers to quickly uncover new insights that are provable and repeatable with clear, accurate data.

"As a trusted partner to scientists for over 35 years, Molecular Devices relentlessly innovates high-content imaging and analysis technology that simplifies complex biological research, leading to faster, more reliable scientific discoveries," said Susan Murphy, President of Molecular Devices. "The ImageXpress Confocal HT.ai system with self-learning image analysis software follows a long history of life science solutions that empower our customers to solve their most challenging research questions with the utmost confidence."

Solving 3D biology challenges with high-throughput imaging and analysis technology

The ImageXpress Confocal HT.ai system enables researchers to capture large 3D organoid and spheroid images with up to double the speed; enhancing throughput while helping the scientific community to overcome roadblocks when working with complex cell models. Notably, it provides:

- Increased multiplexing flexibility due to high-performance laser excitation with seven laser lines and eight filter combinations
- More accurate and reproducible image analysis, enabled by new dual micro-lens spinning disk



- confocal technology with enhanced field uniformity
- Automated water immersion objective technology enables greater image resolution and sensitivity with up to four times the increase in signal, leading to lower exposure times
- Improved accuracy and robustness of high-content image analysis with machine learning through IN Carta® Image Analysis Software. Acquired from GE Healthcare Life Sciences, now Cytiva, a Danaher company, the software has an intuitive guided workflow in a modern user interface and uncovers data insights that other technologies miss.

Reducing the burden on researchers with machine learning

Turning high-content images into actionable insights is a complex process. Relying on traditional analysis methods can lead to errors or oversimplifications that can skew results and diminish assay reliability. IN Carta Software paired with the ImageXpress Confocal HT.ai system uses machine learning to easily convert data-rich image information into repeatable results, while reducing the burden on researchers and increasing throughput.

Two key components of IN Carta Software that leverage machine learning are the software modules SINAP and Phenoglyphs. SINAP uses

deep learning to detect objects of interest to improve accuracy and reliability in the first step of image analysis. Phenoglyphs takes hundreds of image descriptors extracted by SINAP and creates an optimal set of rules for grouping objects with a similar visual appearance. Both modules utilise unsupervised decisions to generate an initial result that is iteratively optimised through user input. Together, they improve the integrity and accuracy of findings through an easy-to-use, end-to-end workflow.

Showcasing innovation at SLAS Europe 2022, 24 – 27 May, Dublin, Ireland

Molecular Devices will be on booth B15 at SLAS Europe. Visitors will have the opportunity to interact one-on-one with product experts and applications scientists and discuss ways to maximise research efforts with the company's advanced life science solutions. ☺



To learn more about Molecular Devices' suite of imaging solutions and the role they play in advancing scientific discovery, visit:

www.moleculardevices.com/imaging



Capture large 3D organoid and spheroid images with up to double the speed!



Increase your throughput, improve image quality and reveal insights other technologies miss with the **ImageXpress® Confocal HT.ai High-Content Imaging System**.

Overcome complex 3D acquisition and analysis challenges – fast!



Learn how
bit.ly/ConfocalHT-ai