

SOLUTIONS FOR 3D CELL CULTURES Microplates and Reagent igh-Content Imaging Sys High-Content Softwar and Informatics

Challenged to develop more predictive cellular assays?

3D cell cultures bridge the gap between 2D cell cultures and animal models, and more closely mimic the biological processes that occur *in vivo*. Now you can address the challenges of growing, detecting, and analyzing these advanced models with our state-of-the-art solutions for 3D cell cultures, including high-content imaging systems, microplates, and reagents. And with new Harmony[®] 4.8 software, you can visualize and analyze your samples in 3D for more relevant information and new insights.



PerkinElmer

PerkinElmer, Inc. is a global leader committed to innovating for a healthier world. Our dedicated team of about 11,000 employees worldwide is passionate about providing customers with an unmatched experience as they help solve critical issues especially impacting the diagnostics and discovery and analytical solutions markets.

PerkinElmer's comprehensive portfolio of technologies helps life sciences researchers better understand diseases and develop treatments. Scientists and clinicians can gain biological insights to improve outcomes through our discovery instruments and reagents, quantitative pathology platform, informatics software and lab services.

PerkinElmer's Operetta CLS[™] high-content analysis system enables scientists to uncover deep biological understanding from everyday assays and innovative applications. The system features a unique combination of technologies to deliver the speed, sensitivity and resolution needed to reveal fine subcellular details.

The Opera Phenix[™] high-content screening system is designed for high-throughput phenotypic screening and cellular analysis, and is ideal for complex disease models such as live cells, primary cells and 3D cell culture models.

Additional information is available at www.perkinelmer.com.

Learn more at www.perkinelmer.com/3DCellSolutions

IN THE SPOTLIGHT: FOCUS IN ON HIGH-CON **ANALYSIS**

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IT'S LIGHTING THE WAY TO A NEW LEVEL OF UNDERSTANDING

Your everyday assays and innovative applications using fixed cells or complex live cell models can reveal deep biological understanding, if you've got the sensitive imaging and intuitive data analysis technology to uncover it. The new Operetta CLSTM high-content analysis system features a unique combination of technologies – automated water-immersion objectives, high-power 8x LED illumination, true confocal optics, and

an ultrasensitive sCMOS camera – to deliver all the speed, sensitivity, and resolution you need to reveal fine subcellular details. And with our simple, powerful Harmony[™] software, Operetta CLS lets you discover even subtle phenotypic changes. Operetta CLS: When great technologies combine, what happens is illuminating.

Check out the new Operetta CLS at www.perkinelmer.com/LightTheWay





IN THE SPOTLIGHT: FOCUS IN ON **H-CONT**

High-Content Analysis (HCA) merges the benefits of high-throughput automation and unbiased analysis with microscopic imaging. This powerful - and now highly accessible - technique allows researchers, whether in small academic or large commercial labs to collect and quantify reproducible multiparametric cellular data. HCA has expanded into all corners of life science since its traditional beginnings in drug discovery; HCA techniques are now used widely and in a diverse range of scientific research areas including oncology, neuroscience, infectious disease, developmental biology, and toxicology, to name just a few. HCA can be applied across multiple scales from quantification of subcellular protein distribution through to analyzing the organization of 3D organoids.

The combination of high sample throughput with multiparametric image and multivariate data analysis enables the detection of even subtle phenotypic changes that isn't possible with traditional laboratory techniques.

BENEFITS





Get quantitative results from your cell images.

Automate your workflow and analyze more samples.

FOR FLOW CYTOMETRISTS

Put your cells into biological context and increase physiological relevance.

Quantify morphology of cells and measure protein abundance and distribution.

FOR PROTEIN BIOCHEMISTS



Increase your throughput. See the heterogeneity of proteins in individual cells rather than the population average.

See the proteins in context.

FOR GENOMICS RESEARCHERS



Link the phenotype to the genotype.

See transcripts in cellular context.

Visualize DNA sequences on chromosomes.

using HCA.

CELL BIOLOGY RESEARCH

HCA can be used to analyze the basic mechanisms underlying cell physiology, cell signaling, and cell function by combining automated microscopy with quantitative image analysis. For example, the specific genes and activities in cell differentiation and proliferation, and the genes involved in cell division and mitosis have been analyzed

DISEASE RESEARCH

Complex models for diseases ranging from infectious diseases, to metabolic diseases. to cancer and even neurological disorders have been successfully analyzed by HCA. Exploring disease mechanisms using HCA can involve simple models, such as infection of cell lines with bacteria. to complex models using patient primary cells or interrogating the interaction of cancer spheroids with T cells in extracellular matrices.

DRUG DISCOVERY

HCA can be used in all stages of drug discovery, including target discovery and validation. It has been used successfully for target based compound screening and is also the tool of choice for phenotypic drug discovery strategies, as it allows the use of complex cell models at high throughput and provides detailed phenotypic fingerprints. In these high-throughput applications, HCA is more commonly known as highcontent screening (HCS).

CELL SIGNALING

- Translocation
- Post-translational modifications
- Protein-protein interactions
- Protein expression levels

Did you know? G-proteincoupled receptors are the targets of many of today's medicines.

CELL FUNCTION

- Cell migration
- Cell invasion
- Cell spreading



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CELL PHYSIOLOGY

- Cell proliferation
- Cell death, autophagy, and apoptosis
- Neurite outgrowth
- Mitochondrial health
- DNA damage & the cell cycle

Did you know? Correlation of phenotypic changes to genotypes is a key application of high-content analysis.

APPLICATIONS

Did you know? Cell migration is integral to many processes, and is studied in oncology to determine tumor invasiveness and in the development of therapies for cardiovascular disease.

> mages provided by PerkinFlme 1. Cells courtesy of Dr. Somponnat Sampattavanich, Department of Pharmacology, Faculty of Medicine, Siriraj Hospital, Thailand. 2. Embryonic rat dorsal root ganglion neurons courtesy of Dr. York Rudhard, Evotec AG.

www.cellularimaging.com