

Countstar
Smart Cell Analysis



Countstar

Mira HT

High-throughput Cell Analyzer

Countstar Mira HT Cell Analyzer integrates AI-learning algorithms, innovative focusing technology, and advanced cell identification features to easily and accurately satisfy any high-throughput counting requirements. Countstar Mira HT utilizes Trypan Blue and AO/PI staining to meet different viability measurement standards and also provides the ability to support GFP/RFP transfection experiments. The versatility is further demonstrated by its compatibility with a variety of automation platforms. The large field of view and short measurement time makes the analytical process fast efficient, and accurate.

COUNTSTAR MIRA HT

1 High throughput

Automatically analyze 15 - 24 samples in a single run.

2 Automation compatible

Capable of being linked to automated liquid handling platforms and slide storage stations, the Countstar Mira HT facilitates integration of customized automation workflow.

3 Advanced imaging technology

8.3 MP CMOS camera chip, together with a 5X high NA objective, provides excellent optical resolution with high fluorescence sensitivity. Large field of view, 2x of the classical hemocytometer, improves counting accuracy of diluted samples.

4 Fast image acquisition and analysis

Fast image acquisition speed (< 30 msec) with advanced CPU enables Trypan Blue based cell titer and viability analysis in less than 20 seconds, while AO/PI or GFP assay in 60 seconds.



CORE FEATURES



SIMPLIFIED WORKFLOW IMPROVES EFFICIENCY



5 AI based image analysis software

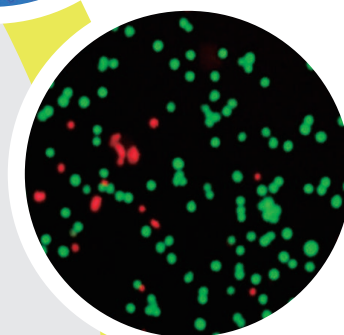
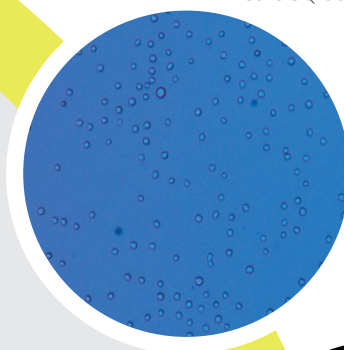
The image analysis algorithms of the Countstar Mira HT are capable of identifying different cell species by their morphological varieties.

6 Data output and export

Exports images, CSV data file, and PDF reports while automatically generating histograms, growth curves, and merged views.

7 Complies with cGMP regulations

The Countstar Mira HT software complies with FDA's 21 CFR Part 11, supporting a safe data backup. A connection to internal servers and/or printers facilitates a safe 3Q authentication process.



LOW SAMPLE VOLUME, HIGH-THROUGHPUT, INTEGRABILITY INTO FULLY AUTOMATED PROCESSES, SHORT ANALYSIS TIME



The Countstar Mira HT comes with an adapter tray that can accommodate up to 3 Countstar chamber slides (15 samples). The all-new, proprietary counting plate has space for 24 samples of 30 μ L each.

Due to increased cell analysis demand in life science, the Countstar Mira HT improves analysis efficiency by compressing analysis time, allowing a higher throughput.

ADVANCED IMAGING TECHNOLOGY ENSURES HIGH ACCURACY, PRECISION, AND REPRODUCIBILITY

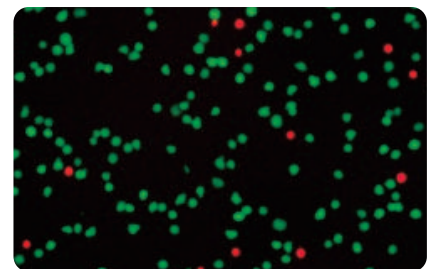
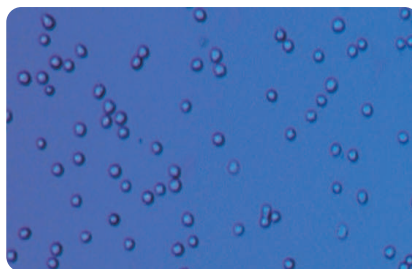
✦ Innovative "focusing" technology

The advanced optical bench, combined with an innovative focusing technology, removes multiple errors related to manual cell counting.



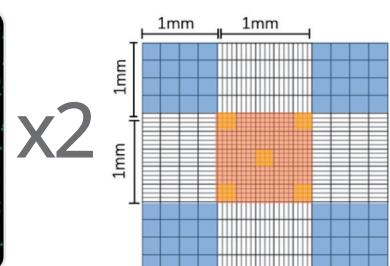
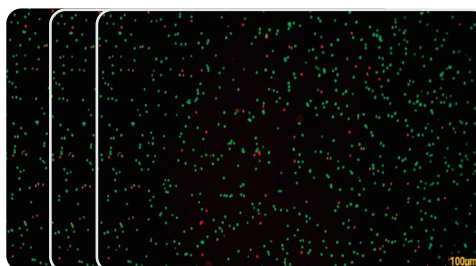
✦ High-resolution imaging in HD quality

The 8.3 MP CMOS camera provides high resolution images, even while capturing weak fluorescence signals.

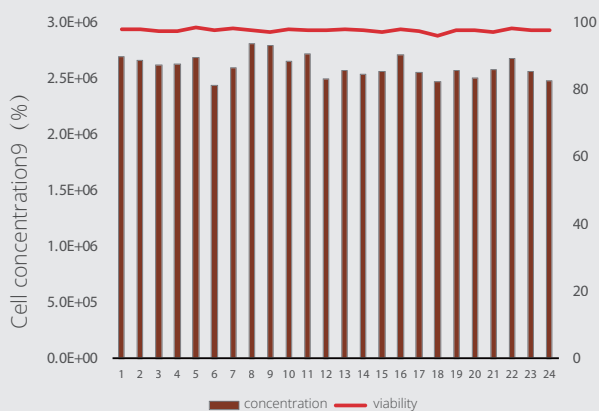


✦ Large field of view

Large field of view allows imaging and capturing twice the sample area compared to a hemocytometer, which improves counting accuracy significantly.

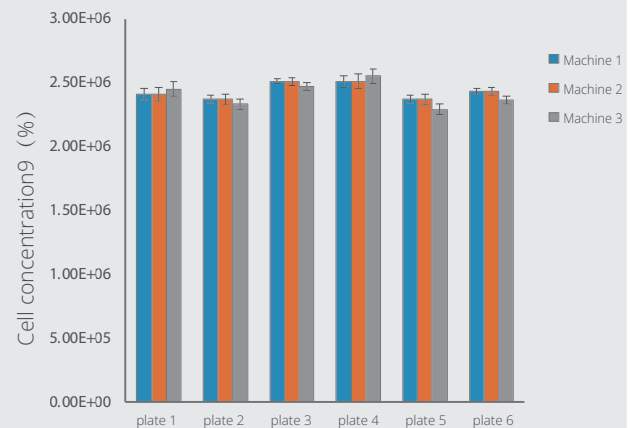


High reproducibility of aliquot analysis



A CHO cell sample, treated with AOPI staining reagent, was aliquoted onto a Countstar 24-chamber plate and measured using the AOPI BioApp on the Mira HT. Excellent reproducibility was observed for both cell concentration measurement (CV% < 10%) and cell viability measurement (CV% < 5%).

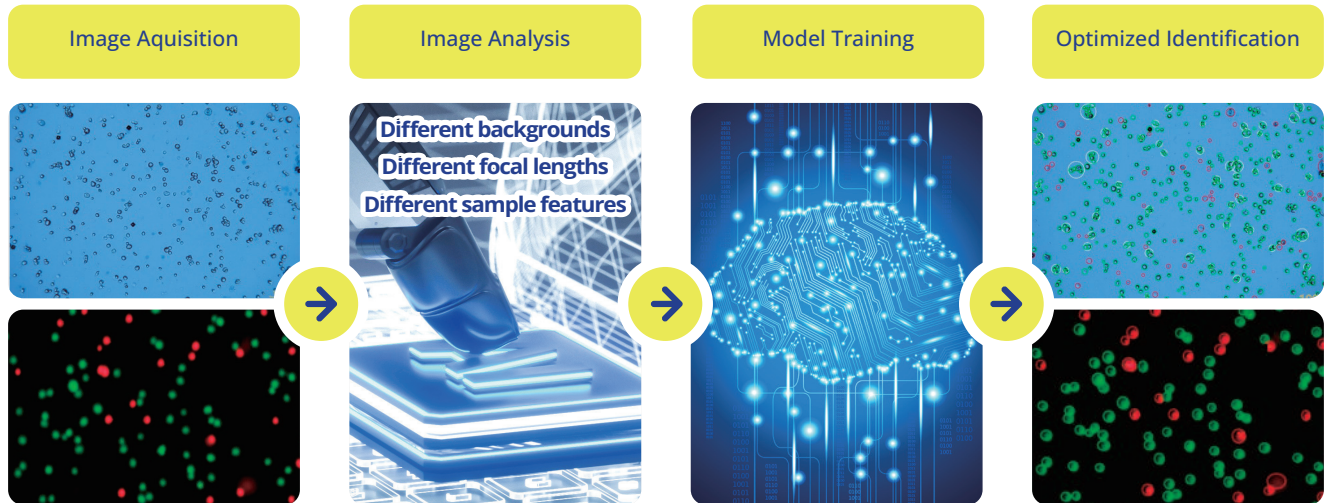
Consistent performance across multiple units



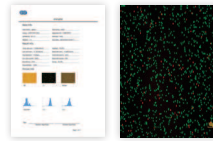
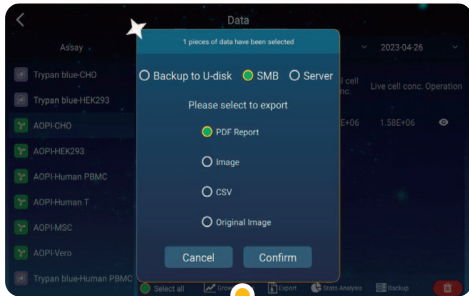
A CHO cell sample was aliquoted onto six 24-chamber plates, then analyzed on three Mira HT cell analyzers. Excellent reproducibility in measured cell concentration values was observed across the six 24-chamber plates (CV% < 10%) and three instruments (CV% < 5%).

ADVANCED AI ALGORITHMS INCREASES ACCURACY - EVEN IN COMPLEX IMAGING CONDITIONS

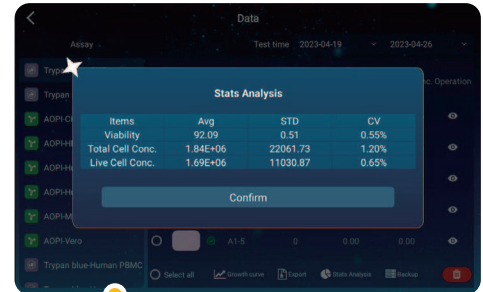
The Countstar Mira HT is able to accurately identify a wide range of cell sizes - even with irregular morphology, and cultures with tendency to form clusters. The AI-based algorithms are capable to distinguish, extract, identify, and quantify unique cell characteristics.



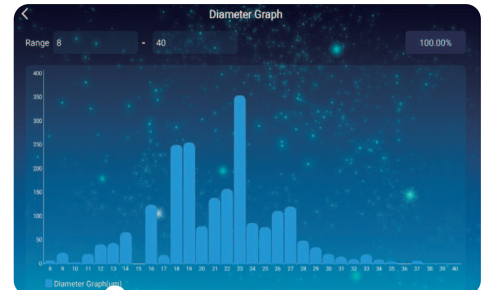
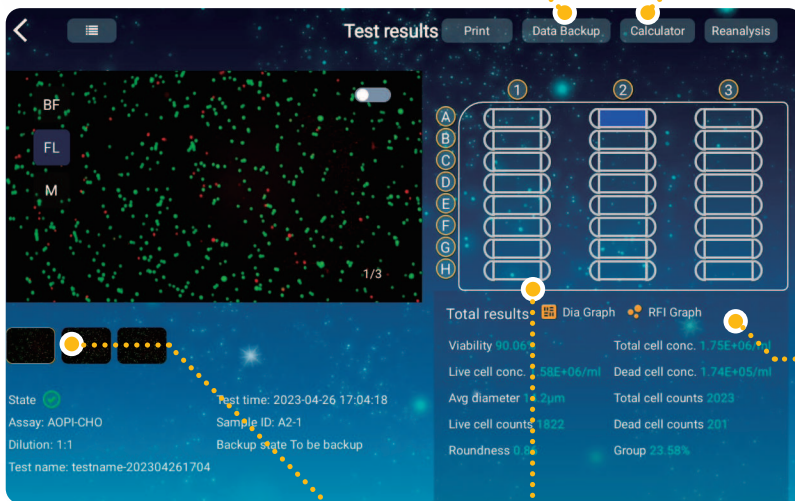
POWERFUL ANALYSIS TOOLS FOR VISUALIZING IMAGES, DATA, AND RESULTS IN MULTIPLE FORMAT



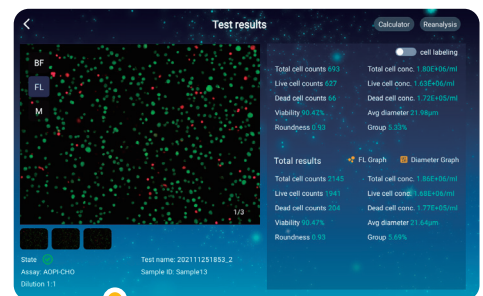
Output formats: Images, customizable pdf reports, csv tab sheets



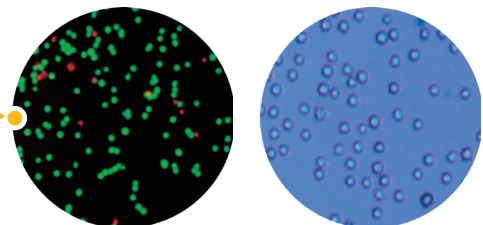
Automatic statistical analysis of measurement series



Diameter distribution diagram



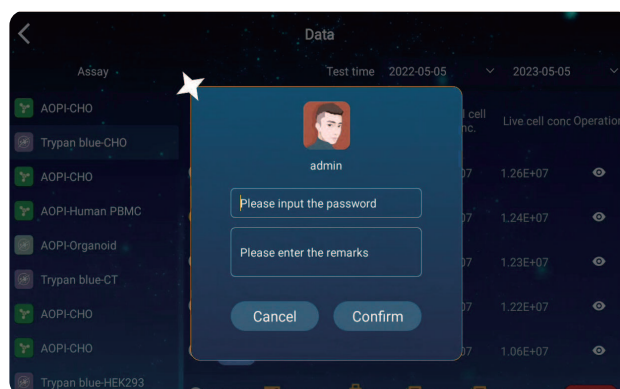
Comprehensive overview of images and result



Acquired images will document additional evidence of early changes in the analysed samples

DATA MANAGEMENT

Comprehensive, customizable, and user friendly data management makes reviewing results intuitive, guaranteeing parallel, safe, and traceable data handling.



✦ BioApp structured result database

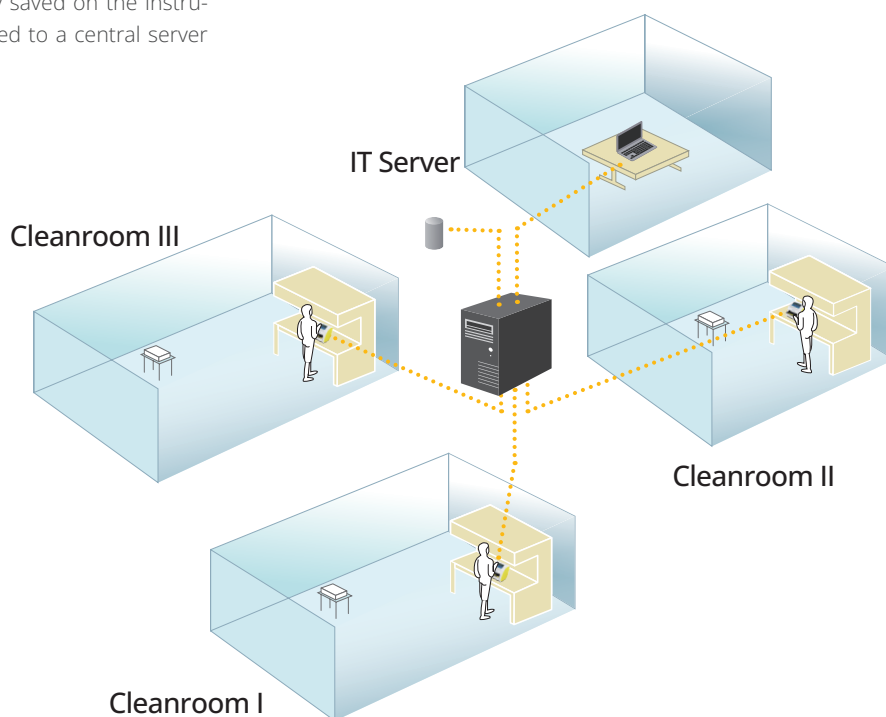
Images and results are organized by BioApps and sorted by analysis time for easy and prompt retrieval.

✦ Secured and safe data management

Unauthorized manipulation or deletion of data is blocked by data encryption, electronic signatures, and user privilege.

✦ Data sharing and backup strategies

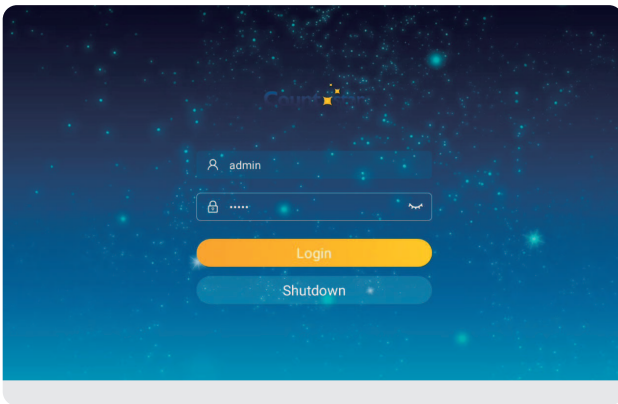
All experimental data is automatically saved on the instrument. The data can also be transferred to a central server via LAN connection in real time.



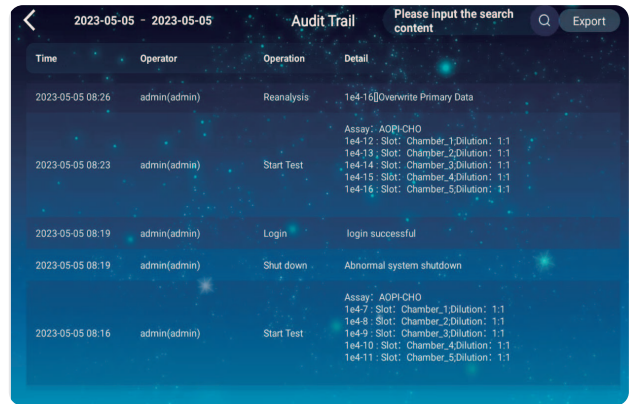
FDA'S 21CFR PART 11 COMPLIANCE AND 3Q VALIDATION SERVICES

✦ cGMP compliant software architecture

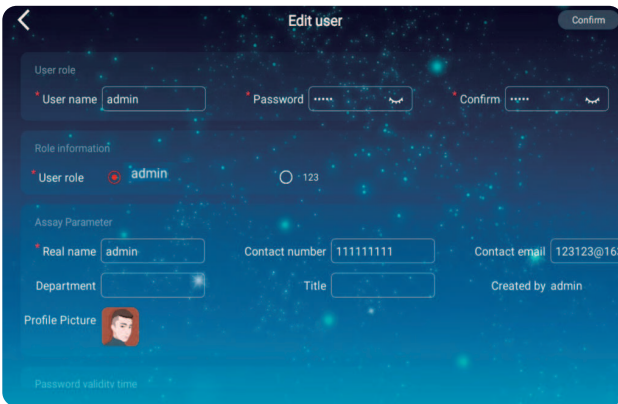
The Countstar Mira FL software features meet all requirements of the FDA's 21 CFR Part 11 regulations for electronic records and user verification.



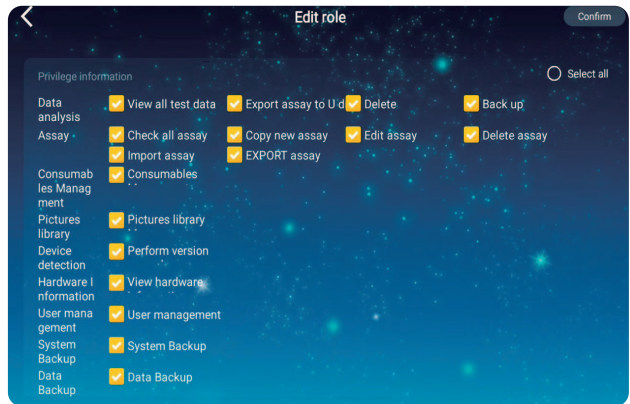
Personalized user login script



Electronic signatures and system audit log database



Detailed User Management Registration



Comprehensive user role definition / restriction menu

✦ Comprehensive 3Q validation services and System Suitability Test (SST) tools

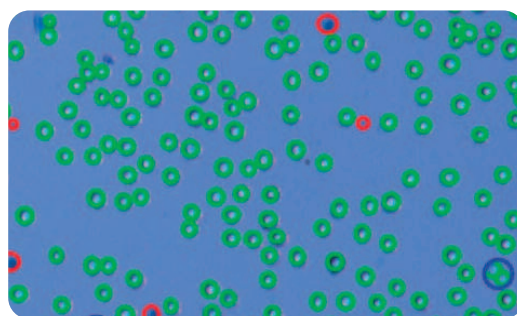
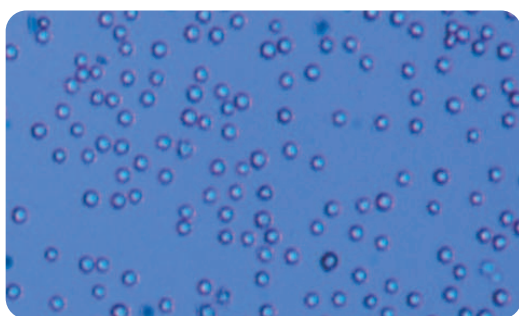
To meet the regulatory guidelines of cGMP production, we provide an extensive package of standard beads suspensions, customizable IQ/OQ/PQ (3Q) documentations, and validation services for the Countstar Mira HT.



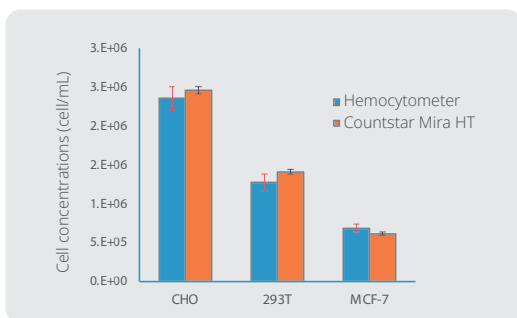
STANDARD TRYPAN BLUE CELL TITER AND VIABILITY ANALYSIS

Trypan Blue staining is one of the most commonly used staining methods for identifying dead cells in tissue and cell culture. Trypan Blue can cross compromised membrane of dead cells, thus staining them in blue color, while normal living cells with intact membrane remain unstained.

The Countstar Mira HT captures clear and high-resolution images, ensures accurate identification of dead cells and clustered cells, and provides accurate results in cell concentration and cell viability rate that are comparable to the gold standard of manual counting using hemocytometer. In addition, Mira HT generates reproducible results at much higher throughput, all acquired images and results are stored automatically for easy retrieval and reanalysis.

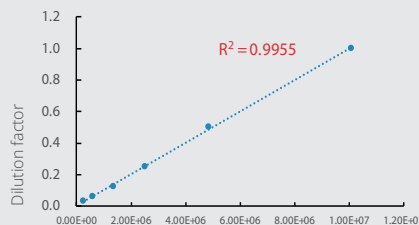
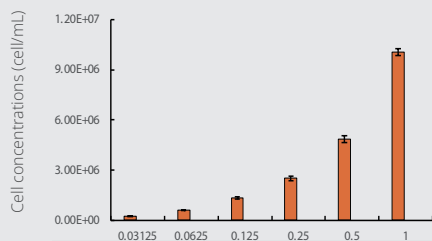


Raw (left) and processed (right) bright field images of CHO cells. Living cells are marked with green circles. Dead cells are marked with red circles. Clustered cells are marked in blue circles.



Three common cell lines (CHO, 293T, MCF-7) were analyzed using Mira HT and standard hemocytometer. Cell concentration was measured from 50 technical replicates for each cell line. The average cell concentration values are very similar, within <10% between Mira HT automatic counting and hemocytometer manual counting. However, the reproducibility on the Mira HT is much better.

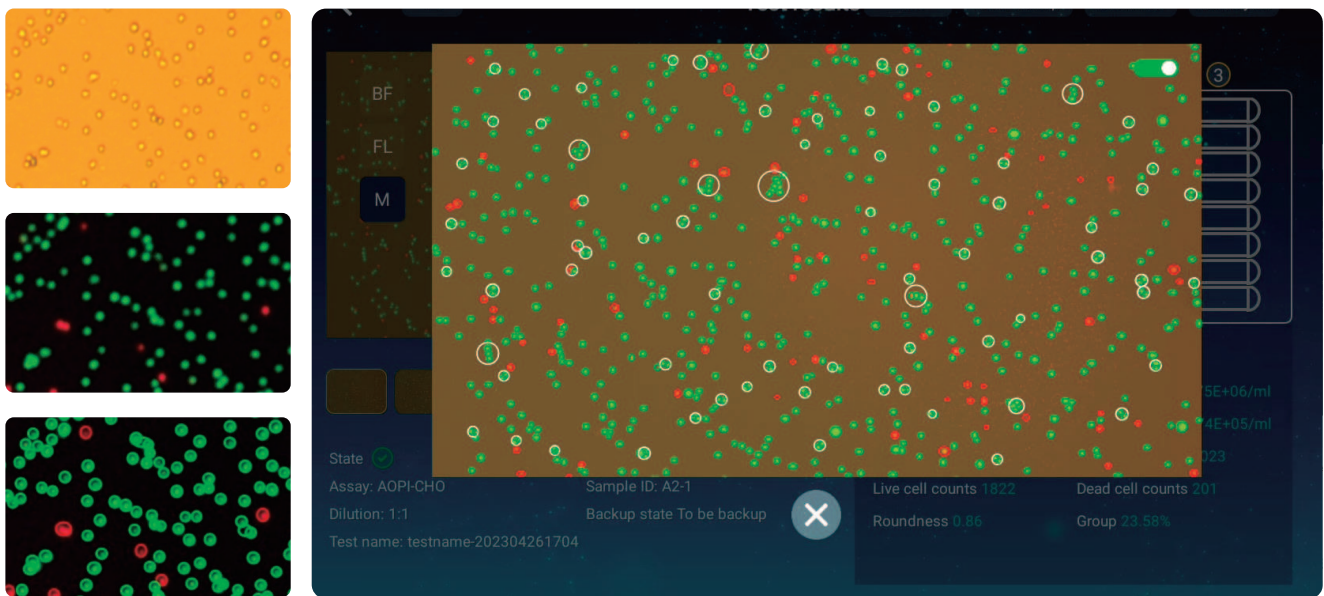
Excellent linear dynamic range



A total of 6 CHO cell samples were prepared through serial dilution. Bright field images were acquired with 5 replicates for each sample. High reproducibility was observed with CV<7% across all concentrations (left panels). Excellent linearity was obtained with R2 of 0.9955, shown in the cell concentration vs dilution factor diagram (right panel).

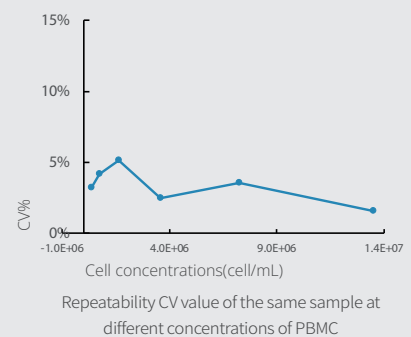
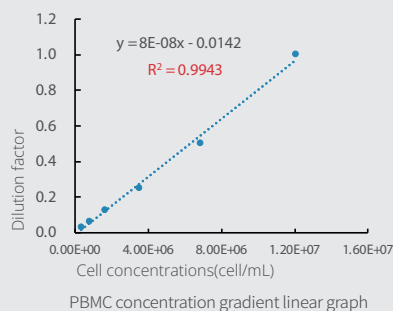
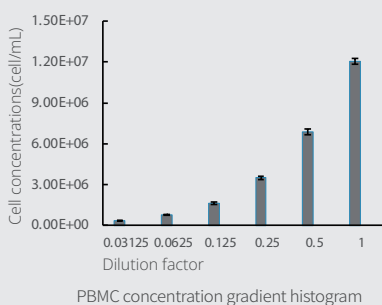
AO/PI DUAL FLUORESCENCE FOR CELL CONCENTRATION & VIABILITY MEASUREMENT

The AO/PI dual fluorescence assay is an advanced method for measuring cell concentration and cell viability than classical Trypan Blue and MTT staining assays. Combination of dyes, Acridin Orange(AO) and Propidium Iodide (PI), enables Countstar Mira HT to specifically & effectively detect viable and dead cells even under sub-optimum or complex conditions, e.g. in the presence of impurities or anucleate cells.



Quantification of PBMCs
 - Bright field view
 - Fluorescence view
 - Assembled overlay labelling

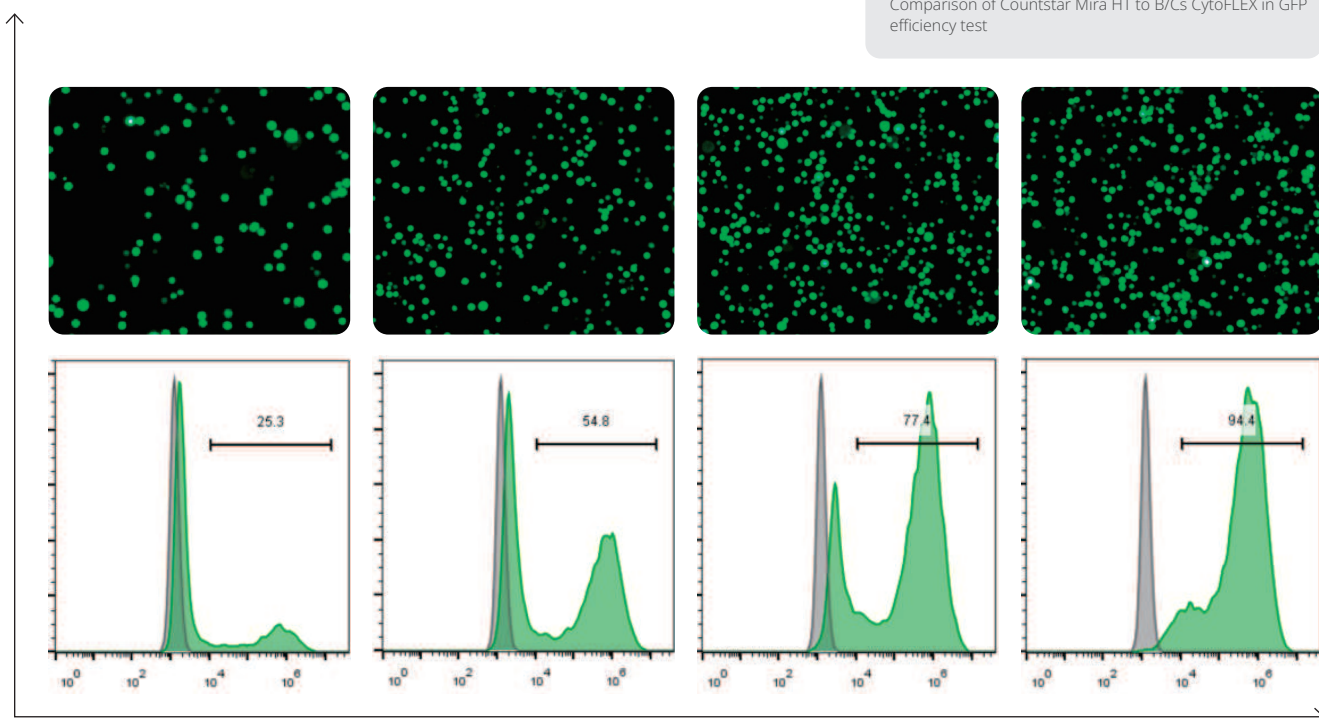
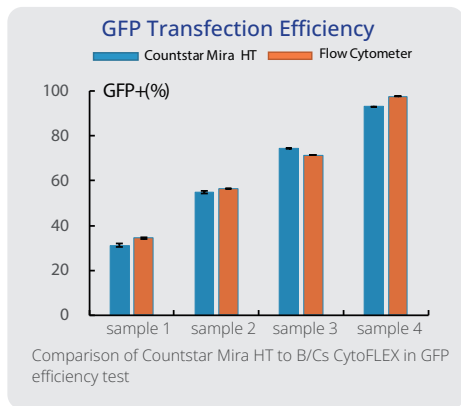
Diagrams show the high accuracy, precision, and reproducibility of results recorded with Countstar Mira HT



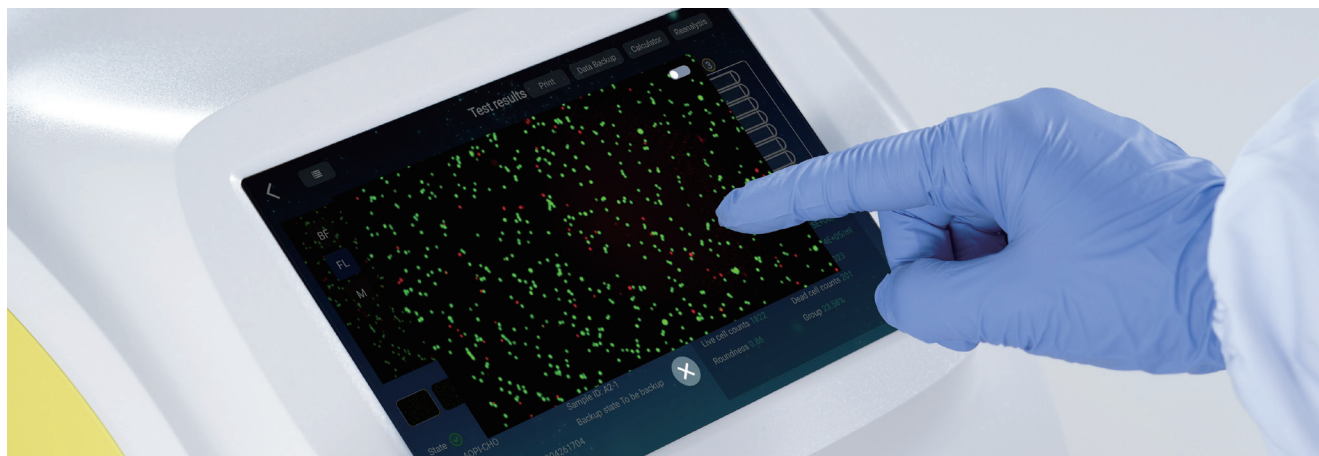
GFP/RFP TRANSFECTION ANALYSIS

GFP/RFP transfection efficiency assays are a common screening tool for product yield monitoring and viral vector optimization. Accurate and precise quantification of these fluorescent markers are critical in cell and gene therapy industry.

The Countstar Mira HT provides accurate results, comparable to flow cytometry, but with an advantage of being able to record images for additional evidence or data re-analysis.



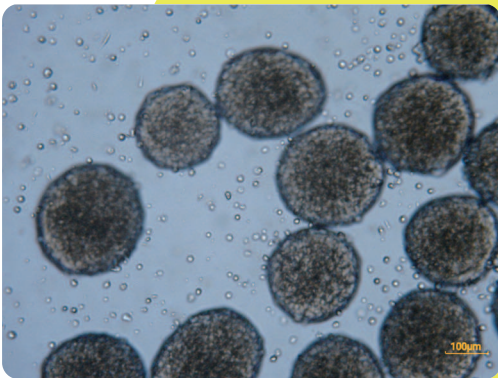
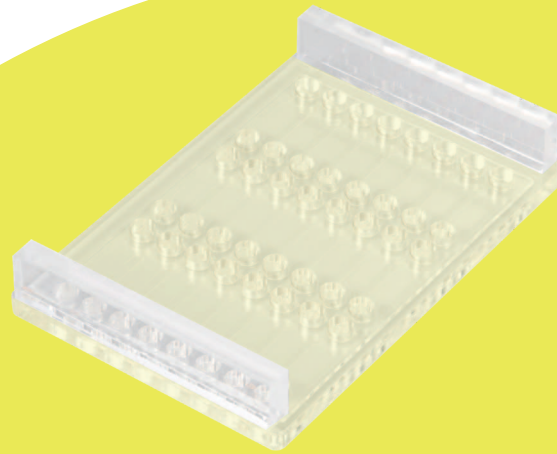
HEK293 transfection efficiency analysis using GFP : HEK293 cells transfected with GFP at different efficiency were analyzed on a Mira HT and a CytoFlex flow cytometer. Fluorescent images obtained on Mira HT (top panels) show increasing transfection levels from left to right. The transfection efficiency values calculated on Mira HT are consistent with those measured on a CytoFlex flow cytometer.



CONSUMABLE - THE COUNTSTAR 24-CHAMBER PLATE

✦ The all new Countstar 24-chamber sample plate

To increase throughput, we designed a proprietary sample plate with 24 chambers. The plate is manufactured under strict quality approach to ensure consistent focal distance. The design allows fast sample introduction by multipipettors or robotic liquid handling platforms. The Countstar Mira HT can complete the analysis of a 24-chamber plate in less than 5 minutes to provide the necessary information about cell density, viability status, and additional parameters of the monitored cells.



IPSC cell cluster count



Immunomagnetic bead residue count



PRODUCT SPECIFICATIONS

Model/name	Countstar Mira HT
Sample throughput	5 / 10 / 15 / 24 sample per run
Diameter range	2 - 180 μm
Concentration range	1×10^4 - 3×10^7 cells / mL
Optimum concentration range	5×10^5 - 1×10^7 cells / mL
Optical magnification	5X
Camera sensor	8.3 megapixel CMOS
Camera field of view	2.8 mm^2
Image resolution(H×V)	1920 px × 1080 px
Fluorescence channel	Ex: 465 - 485 nm Em: 535 / 40 nm、600 LP
USB interface	1 × USB 2.0、1 × USB 3.0
Storage capacity	1 TB
Power input	110-230 V / AC, 50 / 60 Hz
Screen size	8 inch (HD res)
Product weight	8.6 kg
Product dimensions	308 × 335 × 354 mm
Specimen slide adapter	3x Countstar chamber slide tray





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OPEN

PRODUCT ORDERING INFORMATION

	Product name	Model	Product number
Product	High-throughput Cell Analyzer	Countstar Mira HT	IN090102(USA) / IN090103(EUR)
Consumables	24 Chamber Plate(50 pieces/box)		CO040101
	Chamber Slide(50 pieces/box)		CO010101
	AO/PI fluorescent staining solution 5ml/25ml		RE010212 / RE010213
	0.2% Trypan Blue 20ml		RE010112

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Countstar series product is for research purposes only and is not approved for diagnostic operation.

