ICELL8™ Single-Cell System

SEE MORE. DISCOVER MORE.

Capture up to 1,800 single cells and select which cells to process.

POWER – isolate up to 1,800 cells per chip across the broadest range of cell sizes per sample, 5-100um

CONTROL – ability to selectively process ONLY single-cell containing wells of your choice

INSIGHT - process up to 8 samples per chip. Perform the experiments you need to move your research forward
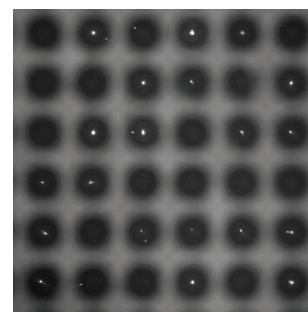

FIGURE 1. CELL CAPTURE VISUALIZATION. Every well on the chip is imaged. Images show the presence or absence of cells in each well. Captured Images are then processed in the CellSelect™ Software.

Advances in next-generation sequencing have improved our ability to work with precious samples and grow our understanding of fundamental biological principles. These insights are typically derived from data "averaged" over bulk cell and tissue samples. However, single cell analyses suggest that cell-specific transcriptome differences may have profound functional consequences.

Transcriptome differences can be uncovered using molecular counting techniques. The first ICELL8 chips and reagents use a unique 3' tagging method to enable this molecular counting. In general, this method is used to identify expressed mRNA molecules and provide relative expression levels within the individual cells, with minimal sequencing.
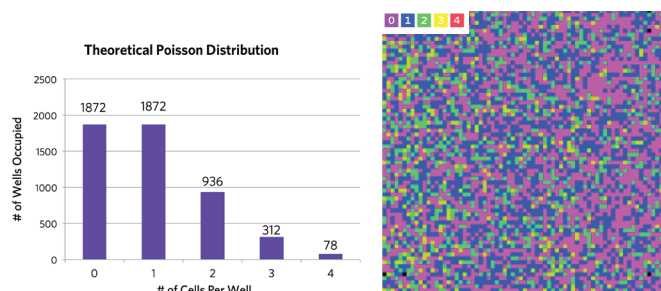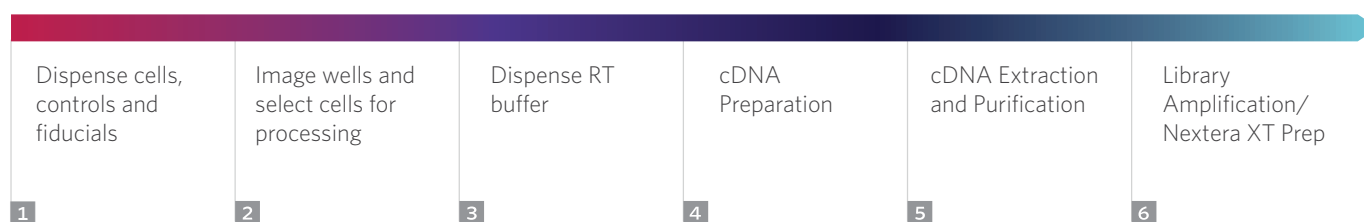

FIGURE 2. ISOLATE UP TO 1,800 SINGLE CELLS PER CHIP. Cells are dispensed using a Poisson Distribution. CellSelect software image map indicates well occupancy rate across the chip

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FIGURE 3. SIMPLE WORKFLOW WITH THE ICELL8 SINGLE-CELL SYSTEM.

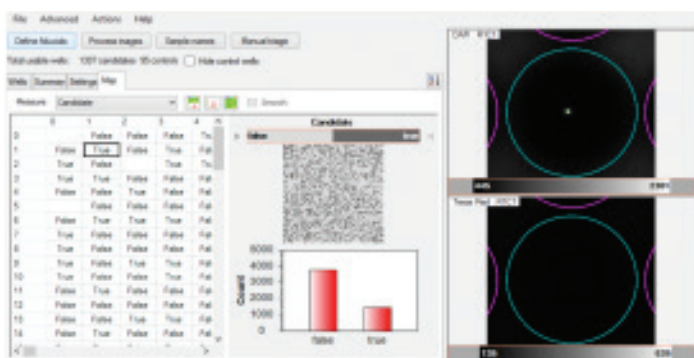| 1	2	3	4	5	6
Dispense cells, controls and fiducials	Image wells and select cells for processing	Dispense RT buffer	cDNA Preparation	cDNA Extraction and Purification	Library Amplification/ Nextera XT Prep

FIGURE 4. CELLSELECT SOFTWARE. Automatically identifies wells containing single cells. Wells can also be individually viewed and selected for further processing.

FIGURE 5. PRINCIPLE COMPONENT ANALYSIS OF MIXED CELL POPULATIONS FROM A SINGLE CHIP. RNA-Seq data from multiple samples with different cell populations was generated from cells isolated on the ICELL8 System. The sequencing results demonstrate the system's unbiased isolation and preparation of different cell types from mixed populations for next generation sequencing.

Clarity Within Complex Samples

Identifying and testing the contributions of individual cells to a phenotype is the heart of single-cell research. To address cellular heterogeneity, researchers need an unbiased method to analyze more single cells, more control over selection of the isolated cells to speed down-stream processing, and the flexibility to analyze multiple parameters per experiments. The ICELL8 System meets these requirements with an integrated and automated single-cell platform.

By rapidly isolating and characterizing thousands of rare and unique cells within multiple samples, researchers can look beyond the aggregate signal seen with traditional bulk processing. The statistical inferences possible with the ICELL8 System greatly enhances the opportunities for discovery within any biological system.

Conclusion

The ICELL8 Single-Cell System is engineered to enhance biological discovery through increased cell isolation, providing control over cell selection for downstream application and enabling complex study design. As the field of single-cell analysis expands and researchers demand more, WaferGen Biosystems is providing the tools to support this promising new field.
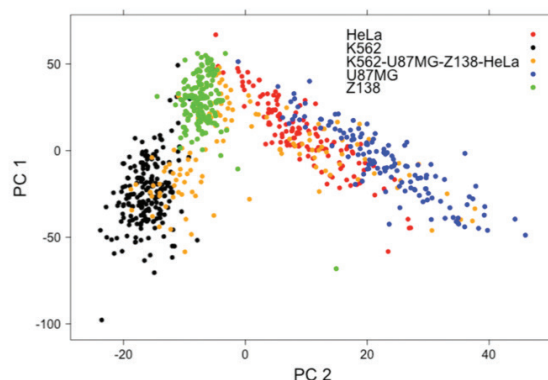
TABLE 1. ICELL8 SINGLE-CELL SYSTEM COMPONENTS.

ICELL8 Chips and Reagents	• 5,184 pre-printed barcode Chip • Second Diluent to maintain cell suspension and viability • Primers for RNA-Seq application
MultiSample NanoDispenser	• Automated distribution of single cells • Accommodates up to 8 samples • Unbiased dispensing of cells from 5-100 µm
Imaging Station	• Configured for rapid and robust chip imaging • Simple user interface for easy set-up
CellSelect Software	• Auto or manual cell selection for downstream processing • Evaluate staining for cell viability*

* Currently using Hoechst dye for cell identification and counting. PI staining for demonstration of cell membrane permeability as a marker of cellular health.

WAFERGEN
B I O S Y S T E M S