LEVITAS BIO

Tissue Processing:

The LeviCellTM Demonstrates Fast and Robust Live Cell Enrichment from a Range of Tissue Types

Introduction

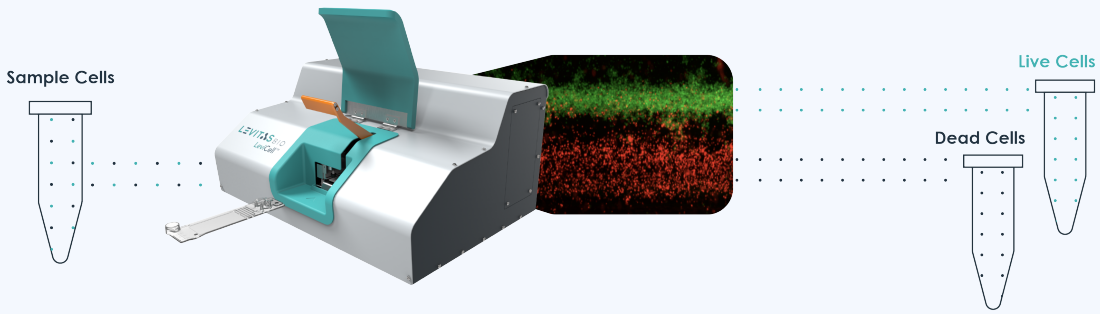
As one of the most vital steps in sample preparation, processing tissue samples – such as resections and biopsies – is also the most challenging. Since these tissue samples are often used for diagnostic and research purposes, it is critical to maintain cell population representation ratios from the original sample while ensuring the enrichment of target cells.

Additionally, because the enrichment and debris removal processes involve multiple complex steps that include exposing the sensitive cells to harsh physical and chemical conditions, low viability and yield are common outcomes. This is a source of frustration for many scientists and researchers who process tissue samples.

The groundbreaking LeviCell levitation technology has proven to efficiently remove dead cells and debris while producing consistently higher yields and viabilities of fragile cell types from a variety of tissue types and has not resulted in changes in gene expression profile. The LeviCell platform enables the gentle selection of viable cells from tissues without the need for cell surface markers or antibodies, as these methods often lead to a biased selection, cell activation, and cell damage.

Method

A frozen vial of dissociated tumor cells (DTCs) was thawed in a water bath at 37°C. With a small amount of ice remaining in the vial, the thawed cells were transferred into 10 mL of warmed media + 10% FBS dropwise. Cells were centrifuged at 500 rcf for 5 minutes. The supernatant was removed, and the pellet was resuspended in 10 mL of warm media. Cell count and viability were determined via Trypan blue staining at a 1:1 dilution.



1 Sample Introduction
Sample pipetted into the LeviCell cartridge.

2 Automated Label-Free Sorting
Magnetic force drives levitation based on cells' physical properties.

3 Sample Collection
Levitated cells transition into separate collection ports for removal.

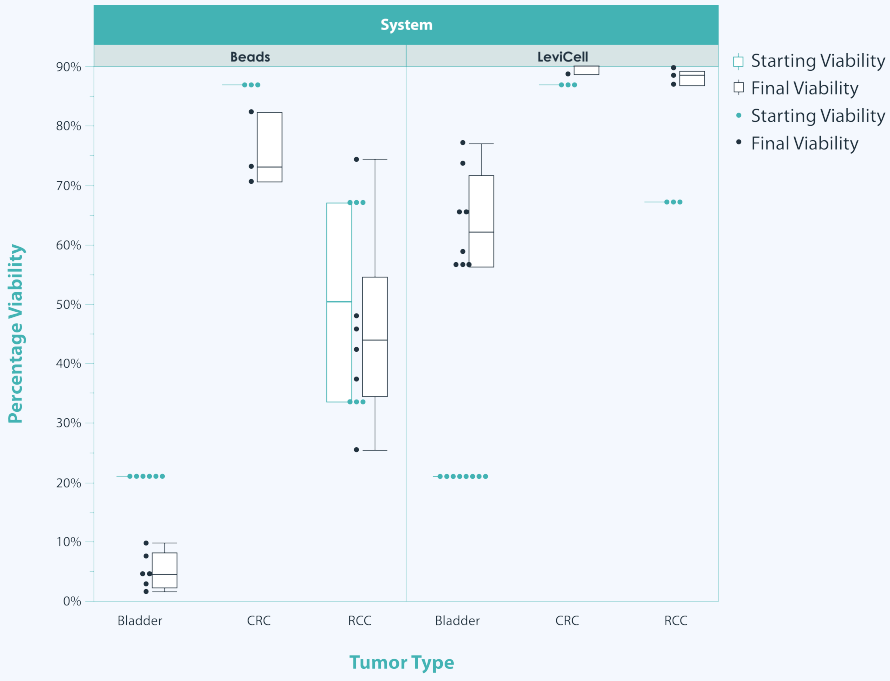
Live cell populations levitate much higher than dead cells and debris, thus allowing for clear separation and collection by the LeviCell, as shown. Please note that the fluorescent dyes used in the provided image were used solely to highlight the separation process and are not required by the LeviCell.

Results

The following graph compares starting (blue) and final (green) viabilities of bladder tumor, colorectal carcinoma, and renal cell carcinoma cells using bead-based enrichment and the LeviCell platform. The LeviCell's superior technical ability to enrich different cell types is evident in the results.

The LeviCell Yield Difference

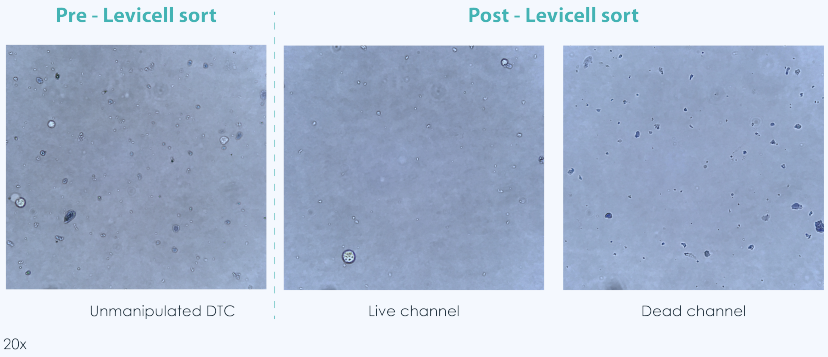
The LeviCell demonstrates significantly greater Live Yield in comparison to the commonly used bead-based enrichment technique.



Unmatched Debris Removal

The images clearly demonstrate that the original debris in the pre-LeviCell sort is removed and not present in the live channel image where the viable cell population is found. The dead channel image contains all of the debris.

EXP418- Bladder DTC

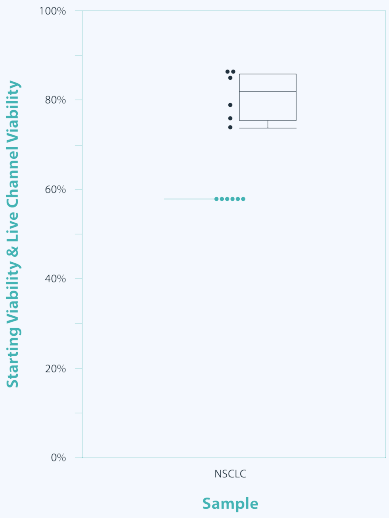


20x

A list of tissue types tested on the LeviCell:

Bladder Tumor	Colorectal Carcinoma	Glioblastoma	NSCLC	Prostate Tumor
Melanoma	Renal Cell Carcinoma	PBMC	Lung	Pancreas

a) **Starting Viability & Live Channel Viability vs. Sample**



b) **Input & Live Channel vs. Population**

Non-small Cell Lung Carcinoma (NSCLC) was enriched for high viability using the LeviCell from a starting viability of 58% to a final viability of 79% (A). The live channel output (red box) shows a similar amount of CD45+, as well as CD3+, CD19+, and CD11b+ cells within the CD45+ lymphocyte population as was present prior to sorting (blue bar) (B). The consistency of robust live cell yield across all cell types is testament to how the LeviCell platform's fast, gentle, and powerful separation technology enables the preservation of original population representation.

Conclusion

The LeviCell's innovative levitation technology platform uses less than 1 psi of pressure to enable a completely touch-free, label-free, three-step gentle sorting process that takes only 20 minutes to complete. The system is truly enabling as a simple, fast and reliable method for working with the complicated and traditionally difficult to process dissociated tumor samples for live-cell enrichment and debris removal. The enriched samples can then be used for a variety of downstream applications such as NGS, single-cell analysis, and compound testing.

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