



AKADEUM
LIFE SCIENCES

BACS™ Dead Cell Removal Microbubble Kit

By any standard, the best dead cell removal product ever made



BACSTM™ DCR Microbubble Kit | The Advantage

Akadeum's Dead Cell Removal (DCR) Kit uses novel Buoyancy Activated Cell Sorting (BACSTM™) microbubbles to provide the next generation of cell isolation. Existing DCR methods are known to be harsh on delicate cells, yield too few viable cells, require a high capital cost or time investment. With microbubbles, those hurdles are eliminated. Microbubbles bind to dead cells present in a sample and simply float them to the top, leaving the viable cells completely untouched and unaltered.

BACSTM™ TECHNOLOGY OFFERS A REVOLUTIONARY DCR APPROACH, DELIVERING MORE CELLS FOR BETTER SCIENCE










THE AKADEUM EDGE

Akadeum's BACSTM™ microbubbles offer several advantages over existing technologies:

GENTLE	EFFICIENT	FLEXIBLE	COMPATIBLE
Isolates cells in their natural state	Keep more cells with up to 86% recovery of viable cells routinely achieved	Effective across a broad spectrum of sample sizes and types	Fits into existing workflows and enhances applications like flow cytometry, scRNA-Seq, & more!

PROCESS MORE SAMPLES IN LESS TIME

Compared to common DCR alternatives, microbubbles are easy to use and accommodates low cell numbers while enabling higher throughput

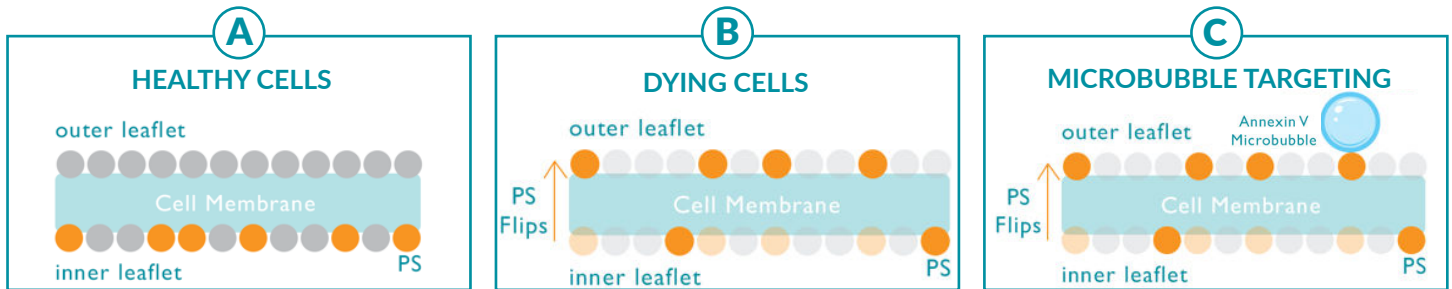
Magnetics	Microfluidics	BACSTM™
 Prep Required? Yes	 Prep Required? Yes	 Prep Required? No
 # of Samples 4 per run Minimum Cell # 1M or more	 # of Samples 1 per run Minimum Cell # 1 to 2M	 # of Samples Over 24 per run Minimum Cell # 500k or lower
 Columns Cartridges? Yes Additional Equipment? Yes Instruments? No	 Columns Cartridges? Yes Additional Equipment? No Instruments? Yes	 Columns Cartridges? No Additional Equipment? No Instruments? No

BACSTM™ DCR Microbubble Kit | The Technology

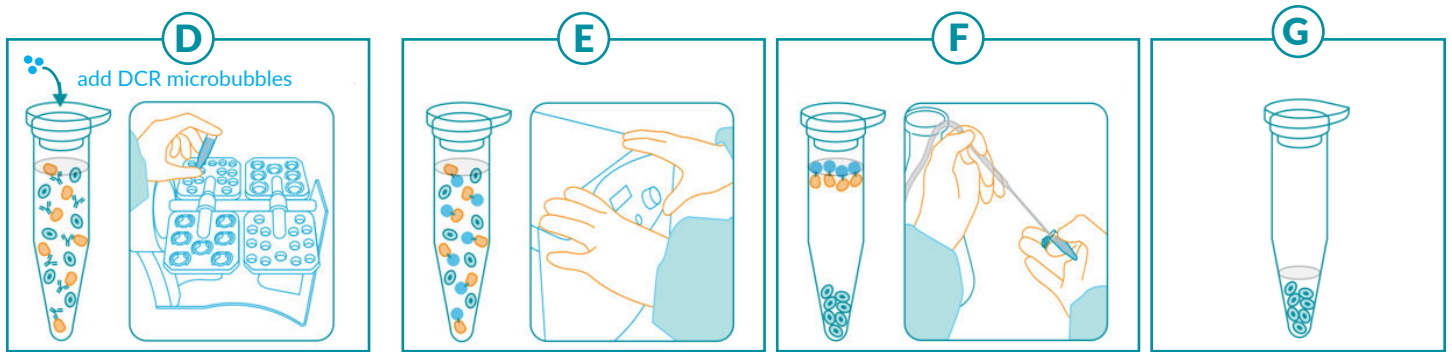
Akadeum's microbubble technology overcomes long-standing headaches in sample preparation, applying this technology to dead cell removal is an impactful way to leverage the microbubble depletion workflow.

HOW BACSTM™ DCR WORKS

Dead cell removal (DCR) is achieved through [A-B] the selective capture of cells with exposed phosphatidylserine (PS) using Annexin V conjugated BACS microbubbles. [C] Once mixed with the sample, the microbubbles capture dead cells and float them to the surface for removal.

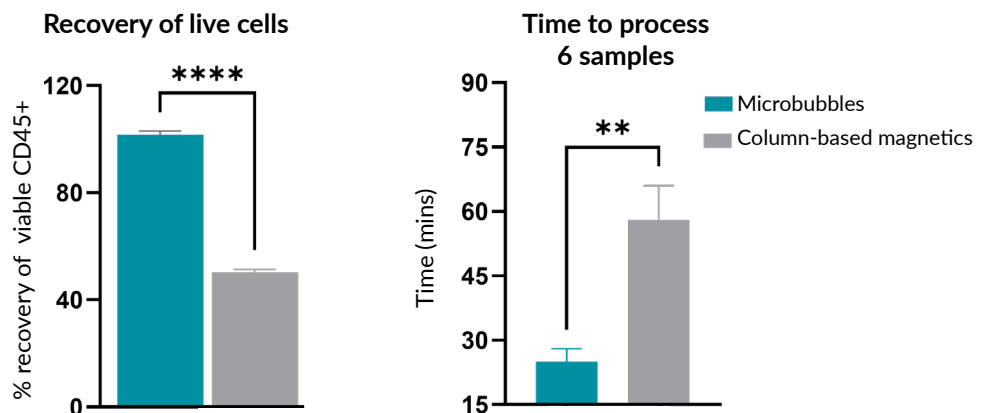


This isolation is achieved in less than 30 minutes through a streamlined, 3-step workflow. [D] DCR Microbubbles are mixed into the sample where they bind to dead and dying cells. [E] Following mixing, the inherent buoyancy of the microbubbles quickly allows them to gently float the dead cells to the surface. [F] Microbubbles and dead cells are then aspirated away, [G] leaving the viable cells untouched and ready for downstream applications.



AKADEUM'S MICROBUBBLE DCR KIT OUTPERFORMS MAGNETIC ASSAYS

In head-to-head comparisons with column-based magnetics, BACSTM™ DCR kit allows for the recovery of 2X as many cells in 1/2 the time.

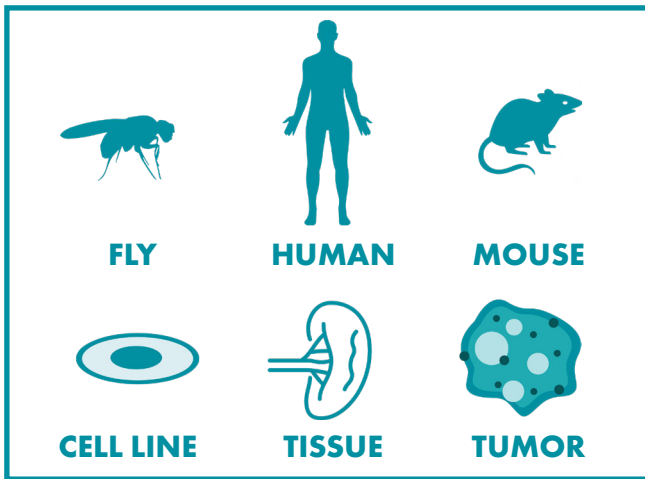


BACS™ DCR Microbubble Kit | Applications

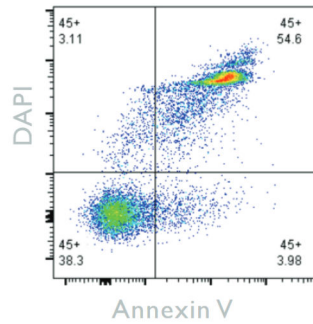
HIGH-QUALITY PERFORMANCE ACROSS DIVERSE SAMPLES

BACS™ microbubbles offer a versatile platform for effective DCR from a variety of sample types. Experiments completed with various species and tissues types, demonstrated that DCR microbubbles allow for high viability recovery in both fresh and frozen tissues.

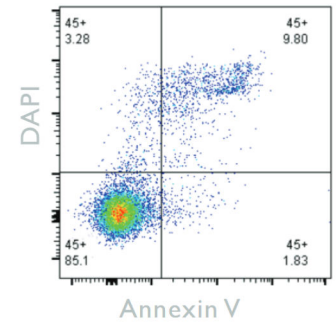
MULTI-SPECIES & TISSUE UTILITY



Before Dead Cell Removal:
38% Viable



After Dead Cell Removal:
85% Viable

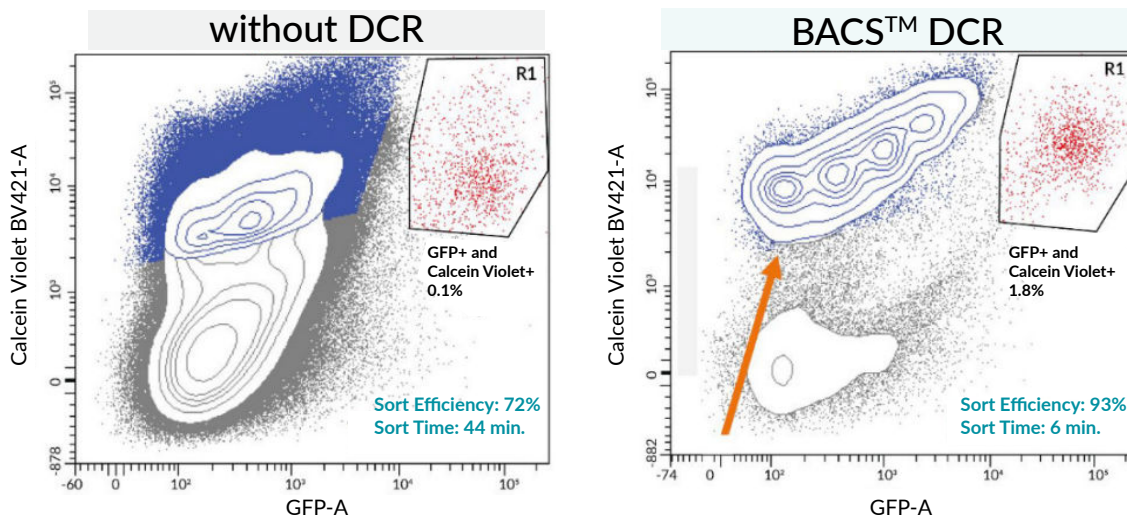


“Using our other methods would have been a waste because we would not have gotten any cells back”

- Lab Manager

SAVE SORTING TIME WITH CLEANER SAMPLES

Characterization of biological samples relies on analytic platforms including fluorescence-activated cell sorting (FACS) and single-cell RNA sequencing (scRNA-Seq) for examination of cell populations. Effective depletion of dead cells upstream of these analyses is essential, as dead cells and debris removal reduces FACS sort times and produces more accurate scRNA-Seq results. In a study completed with *Drosophila*, tissues were harvested and dead cells were depleted using Akadeum’s DCR Kit. Desired cell populations were labeled and resultant viability of germ cells was assessed using FACS.

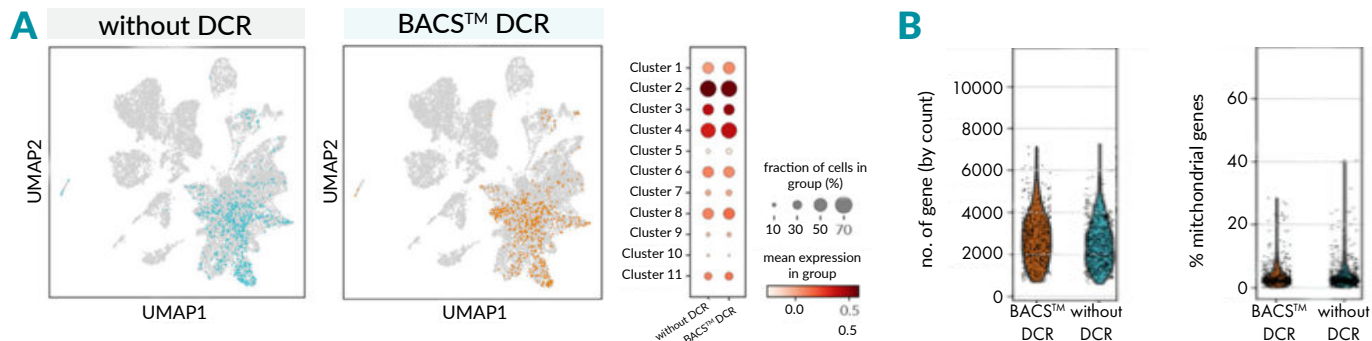


The DCR Kit cut sort time by 86%, reducing the required time from 44 minutes to only 6 minutes. DCR microbubbles also improved FACS sorting efficiency, results in an 18-fold enrichment of viable target cells.

BACS™ DCR Microbubble Kit | Applications

PERFORM DCR WITHOUT ALTERING GENE EXPRESSION

Gene expression analyses, such as scRNA-Seq analyses require high-quality sample preparation. An essential step in this pre-processing pipeline is DCR, as samples containing a high percentage of dead cells can negatively impact results by increasing background noise and confounding findings.

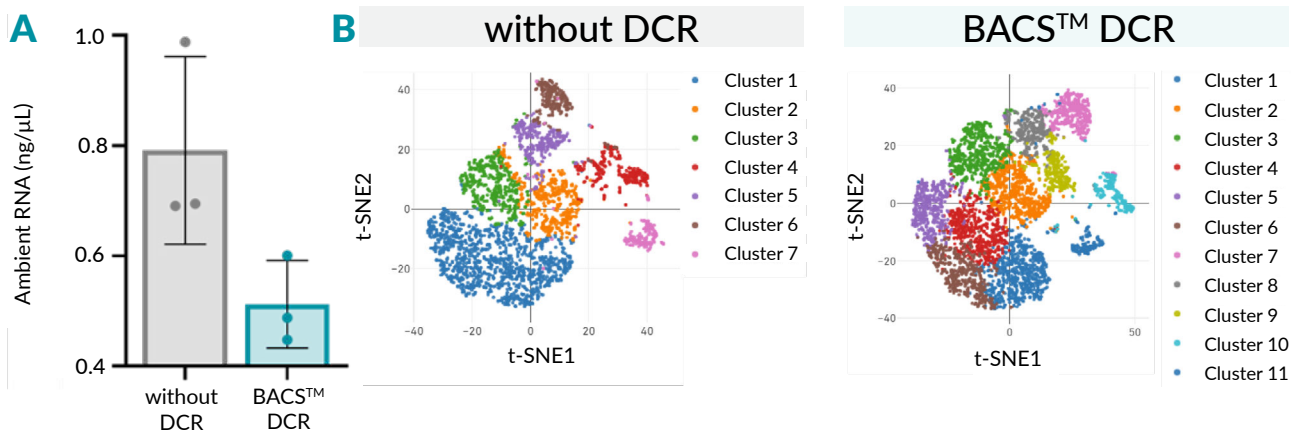


The DCR Kit was used to deplete dead cells from twenty-nine tumors samples. The remaining viable cells were labeled and sorted via FACS to isolate the desired tumor cells. Following FACS, scRNA-Seq was performed. In total, microbubbles saved 6 hours of sort time without changing [A] cellular population clusters or [B] cellular frequencies represented in the gene expression data.

“I’d rather use akadeum’s kit than columns or levitation because you can process so many more samples”
- Postdoctoral Fellow

IMPROVE SAMPLE QUALITY FOR DOWNSTREAM ANALYSIS

In additional experiments with the Akadeum’s microbubble platform, BACS™ DCR improved quality of downstream scRNA-Seq reads, by providing increased viability and reduced background noise. Overall, improving the definition of cellular subtypes in subsequent analyses.



Readout	Without DCR	BACS™ DCR
Viability	85%	95%
Estimate Number of Cells	3262	5638
Fraction Reads in Cells	82.9%	92.0%

Akadeum Life Sciences | About Us

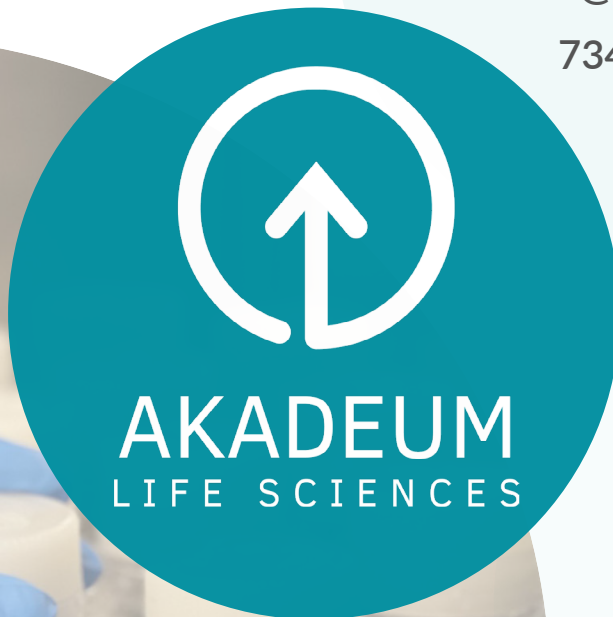
Akadeum has developed the next generation in cell separation using buoyancy-activated cell sorting (BACS) microbubbles. These microbubbles have revolutionized cell separation, allowing scientists to develop treatments in a fraction of the time of previous workflows. Experience the microbubble difference for yourself! Book a meeting with our expert scientific staff to discuss your application, or shop our Dead Cell Removal and other Microbubble Products online at www.akadeum.com.

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