



Microbubble Technology for Cell Selection & Activation

A bead-free approach to simpler, scalable
cell therapy research workflows

For Research Use Only. Not for Use in Humans.



LIFE FROM INSIDE



A Simpler Approach to Cell Therapy Research

Bracco's BubbleGen™ lipid-based microbubble technology enables cell selection without magnetic beads, columns, or hollow glass microspheres.

Using biocompatible microbubbles that deflate after use, the technology supports flexible isolation of complex cell populations through positive, negative, and sequential workflows.

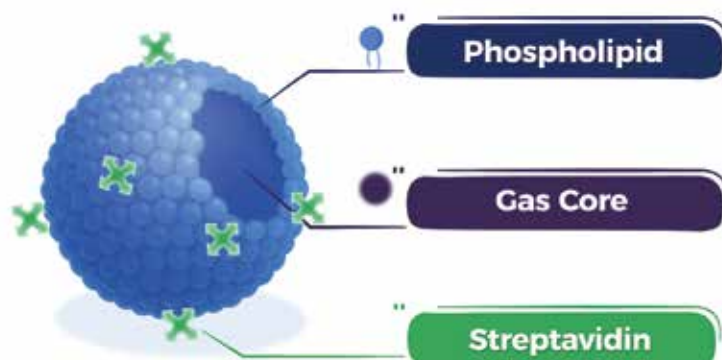
Designed for scalability and integration, it can also combine cell selection and activation, reducing process complexity and streamlining cell therapy research.



Introducing the BubbleGen™ Microbubble

Designed for residual-free cell selection and activation, our platform employs streptavidin-conjugated, lipid-based microbubbles featuring a gas core, eliminating magnetic residuals entirely.

This approach allows researchers to target hard-to-isolate cell populations and subpopulations.



BubbleGen™ Cell Selection and Activation Microbubble Technology at a Glance



Antibody-Driven Targeting

Biotinylated antibody-driven targeting enables precise selection of a wide range of immune cell subsets (e.g., CD3, CD4, CD8, TCR γ/δ , CD34).



Biocompatible

Microbubbles exhibit a strong preliminary safety profile. Our non-magnetic technology provides gentle, bead-free separation of target cells to support downstream cell therapy research workflows.



Open Technology Ready for Integration

System is open and ready for integration into your automated, closed research platform(s).



T Cell Activation

Achieve T cell selection and activation simultaneously with Bracco's microbubbles.



Positive, Negative, and Sequential Selection

Perform positive, negative, and sequential selection using the same research workflow.



Traceless

Cells are released by "popping" the bubbles through gas exchange for efficient selection.



Cell Selection Shouldn't Be the Bottleneck

Cell selection is critical to cell therapy research, yet traditional approaches can add specialized equipment, proprietary consumables, and multiple handling steps that increase complexity, cost, and the risk of cell loss or stress. Researchers need a more flexible approach that maintains cell quality, supports diverse selection strategies, and scales on the research bench.



The individual who appears is for illustrative purpose. The person depicted is a model and not a real healthcare professional.

Solving Key Cell Selection Challenges



Eliminate Magnetic Residuals

The bead-free BubbleGen™ technology reduces process risk associated with magnetic bead carryover.



Streamline Research Workflows

Reduce research workflow complexity with a bead-free, column-free process that eliminates the need for specialized magnetic separation equipment.



Simplify Integration

BubbleGen™ is designed to work with existing cell therapy research processes and is compatible with a wide range of platforms and modalities.



Flexible Cell Targeting

Built on a universal streptavidin backbone, BubbleGen™ can be paired with biotinylated antibodies to target virtually any cell population and supports positive, negative, and sequential cell selection.

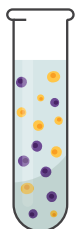


Scale with Confidence

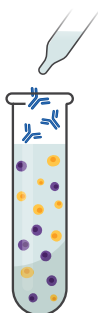
Integrate seamlessly with fully open, automation ready microbubble technology designed for closed, end to end systems.

The Cell Selection and Activation Process with BubbleGen™ Microbubbles

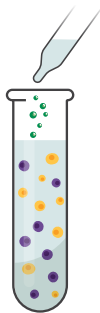
1 Prepare cell suspension



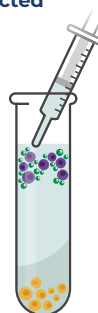
2 Couple biotinylated antibodies to cells



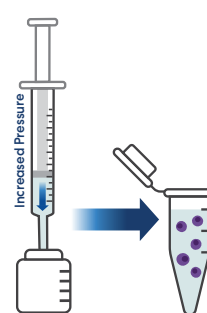
3 Add BubbleGen MBs to the cells



4 Microbubble-bound cells rise and are collected



5 Pop microbubbles to release target cells



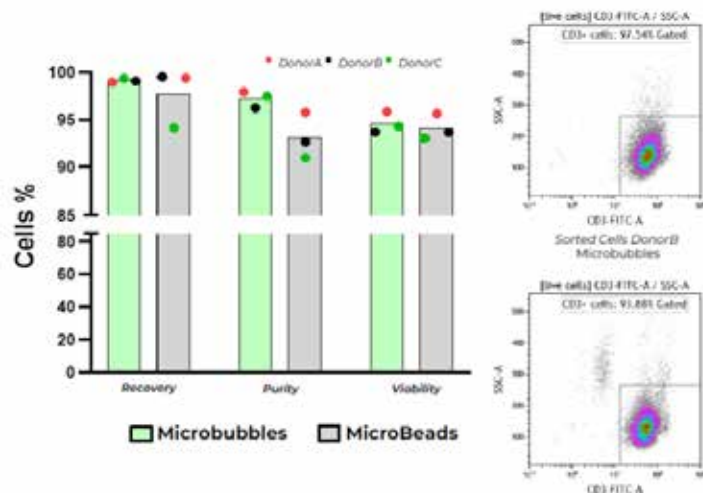
High Purity. High Recovery. High Confidence.

Bracco microbubbles have demonstrated robust performance across multiple cell types and starting materials.

In T cell research workflows:



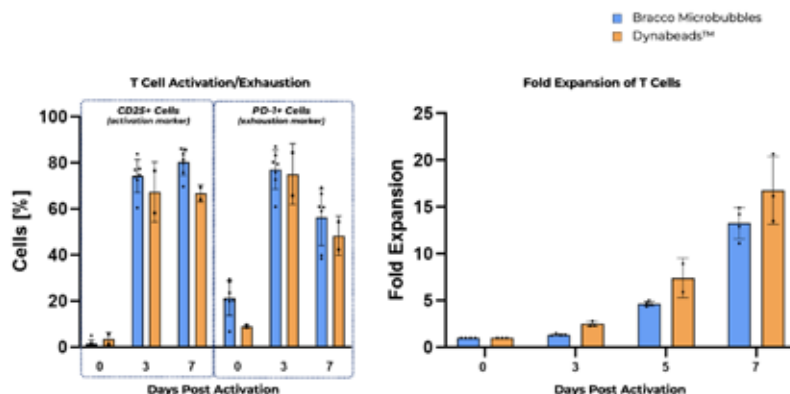
These results highlight the platform's ability to address both **standard and rarer cell populations**.



Simplify T Cell Selection and Activation with BubbleGen™

In comparative studies, BubbleGen™ microbubbles demonstrated:

- Comparable T cell activation, with similar CD25+ expression at Days 3 and 7
- Decreasing transient PD-1 expression over time
- Continued T cell expansion through to at least Day 7



Cells cultured in RPMI medium with 10% serum + IL-2
Cells were split every 2 days at 5×10^5 cells / mL

Selection of Rare Cell Populations and Subpopulations

Now hard-to-isolate cell populations and subpopulations can be isolated with the BubbleGen™ microbubble technology.

Cell Type	Starting Sample	Purity	Recovery	Viability
CD34+	Fresh mobilized apheresis (2×10^9 WBC, 2.95% CD34+)	96.3%	93.8%	~90%
TCR γ/δ	PBMCs (1×10^7 , 3.1% γ/δ +))	>96%	>80%	>97.4%

Sequential Selection with BubbleGen™

Cell Type	Starting Sample	Purity	Recovery	Viability
CD4+, CD184+	Whole blood (4mL) or PBMCs	85% (WB), 93% (PBMCs)	~ 2.9×10^5 target cells collected	93.5%



Cell Selection Products

BubbleGen™ CD3+ Cell Selection Kit, RUO

A ready-to-use solution for positive selection of CD3+ T cells using Bracco's bead-free microbubble technology.

Product Highlights

- Up to 1 billion total input cells
- Bead-free, column-free workflow
- No specialized magnetic separation equipment
- Cell release through microbubble deflation
- Designed for downstream cell therapy research



Demonstrated Performance



Kit Contents

- 2 vials BubbleGen™ Streptavidin Microbubbles
- 1 vial BubbleGen™ Human CD3 Biotin Positive Selection Antibody
- 2 vial adapters

Explore the BubbleGen™ CD3+ Cell Selection Kit

www.bracco.com/celltherapy/bubblegen-cd3-cell-selection-kit

BubbleGen™ Cell Separators, RUO

Purpose-built separators for the flotation and collection of microbubble-bound cells during BubbleGen™ cell selection workflows.

Product Highlights

- Designed for use with BubbleGen™ cell selection kits
- Maximum capacity of 1×10^8 total cells per separator
- No magnetic racks or columns required
- Supplied in packs of 10



Learn more about the Cell Separators

www.bracco.com/celltherapy/bubblegen-cell-separators

About Bracco, an Established Global Partner

Cell therapy research programs require long-term technology and supply partners. BubbleGen™ is backed by Bracco, an established global healthcare company with decades of manufacturing, regulatory, and microbubble experience.



1927 Founded

Leader in Diagnostic Imaging, FDA and EMA Approved Products



3,800 Employees

11 Centers of Innovation, 9 Plants Globally



~2.0 bn € Total Annual Revenue

Privately-Held, Headquartered in Milan, Italy



25+ Years

GMP manufacturing experience in Geneva, Switzerland



25+ Years

Regulatory-approved proprietary microbubble technology clinical use in Diagnostic Imaging

Ready to Evaluate BubbleGen™ in Your Research Workflow?

Explore our products, request a quote, or discuss your cell selection research workflow with our team.

BubbleGen.com | celltherapy@bracco.com



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