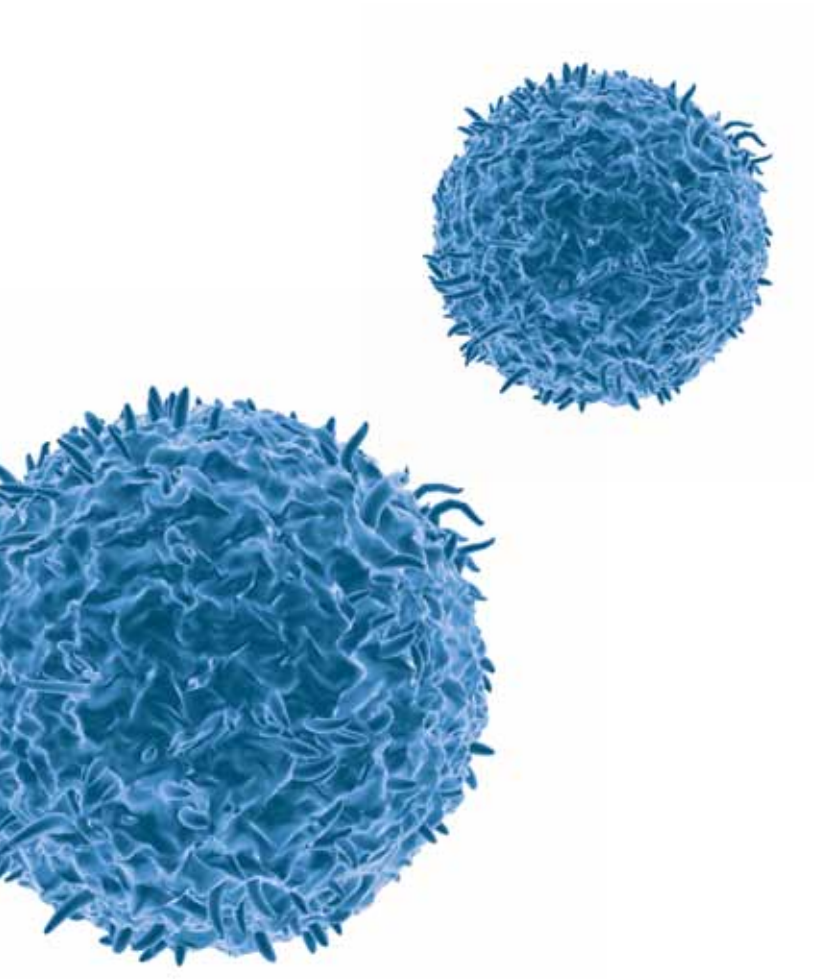
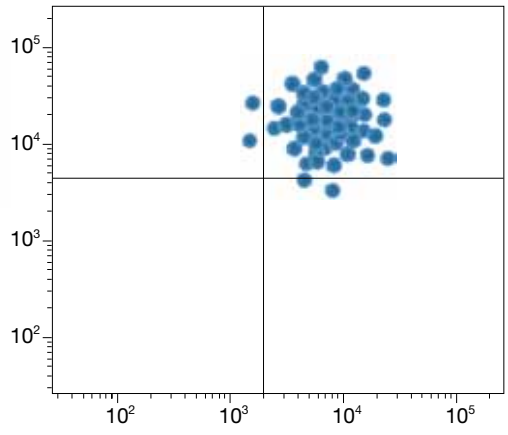
Low impact on cells, high impact on results

Dynabeads® FlowComp™ technology for positive isolation of human and mouse cells





invitrogen™
by life technologies™

Low impact on cells, high impact on results

Dynabeads® FlowComp™ technology

- → Isolate from whole blood, buffy coat, or mononuclear cells
- → Release the cells and remove the beads
- → Better purity and viability
- → Tube-based method, no columns required

The immune system protects us from harmful substances through a complex interplay of immune cells. Cell isolation is the first of many steps in immunological workflows, and exposure of your cells to certain foreign substances during this step can influence your results.

Avoid artifacts

When using column-based systems with "biodegradable" nanoparticles, the magnetic particles are left on the cells after positive isolation. There is growing concern among scientists about what the short- and long-term effects of the continued exposure of cells to iron oxides, sugar (dextran), and other potentially harmful substances may be [1–2].

Isolate bead-free cells

In contrast to column-based systems, the Dynabeads® FlowComp™ technology allows you to isolate bead-free cells directly from human whole blood, buffy coat, or from mouse/human mononuclear cells (MNC) (Figure 1). Following separation, the beads are immediately released and removed, ensuring the least possible interaction with your cells.

Column-free method

With the tube-based Dynabeads® technology, your cells are not exposed to the stress of being passed through a dense column. Dynabeads® are larger and have a higher iron content, allowing for faster kinetics and better separation. The isolated bead-free cells maintain their functional characteristics (Figure 2) and are ready for flow cytometric analysis or any downstream cell-based assay [3–7]. Dynabeads® are very stable (shelf life >2 years), are not biodegradable, and show no leakage of iron or other immunogens that could potentially influence your results.

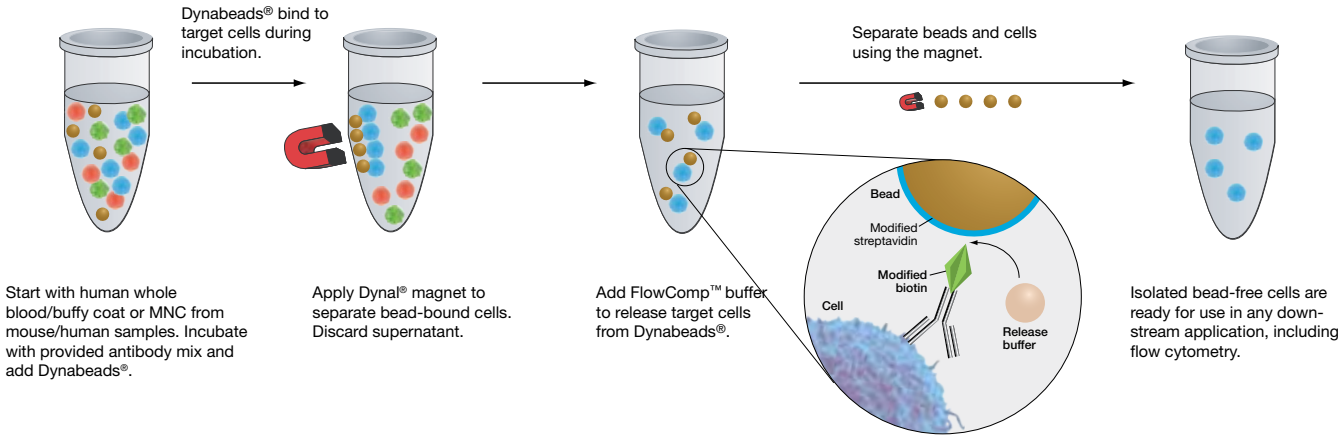


Figure 1. Overview of the simple isolation procedure. The starting sample is mouse/human mononuclear cells (MNC) or human whole blood/buffy coat.

Better purity and viability

For easier flow cytometer read-out, some researchers choose to only gate for the live cells when analyzing their cells. Thus, the apoptotic or dead cells are excluded from the analysis, but not from the sample itself. Dynabeads® FlowComp™ Mouse CD4 yield 83% total recovery (total number of live, non-apoptotic $CD4^+$ cells), compared to as little as 49% recovery with a column-based method (Figure 3). With Dynabeads® FlowComp™ technology, cell purity is also consistently superior (Figure 4).

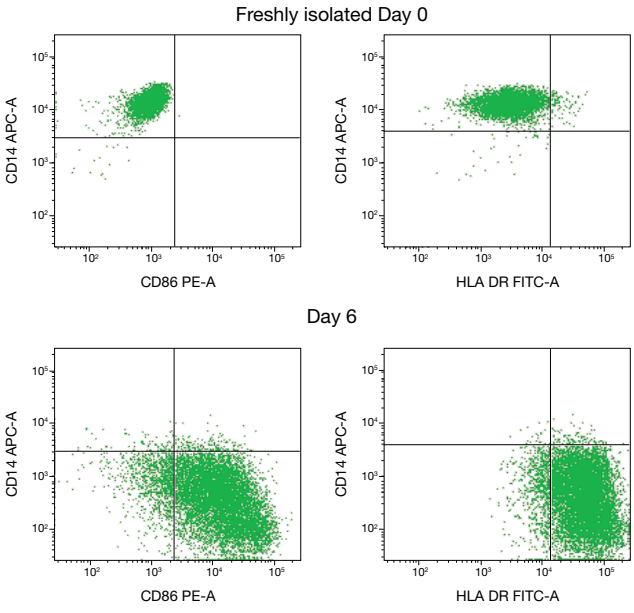


Figure 2. Isolated cells keep their functional characteristics. Dynabeads® FlowComp™ Mouse CD14 was used to isolate monocytes from whole blood. After 6 days of culturing with IL-4 and GM-CSF, the cells differentiated into monocyte-derived dendritic cells (Mo-DC). As seen, CD14 was lost during culture and cells up-regulated HLA-DR and CD86. More than 60% recovery of Mo-DC was observed. Similar results were observed when starting with MNC or buffy coat.

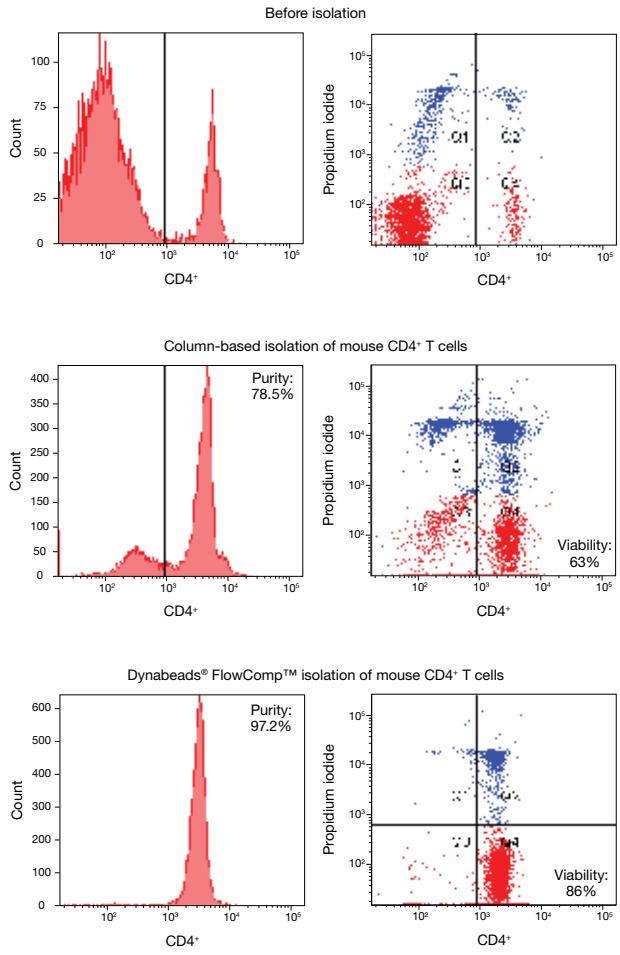


Figure 3. Isolation of $CD4^+$ T cells from mouse spleen cells. Cell isolation using Dynabeads® FlowComp™ Mouse CD4 results in substantially higher purity (97%) and viability (86%) than column-based positive cell isolation (yielding purity and viability of 78% and 63%, respectively).

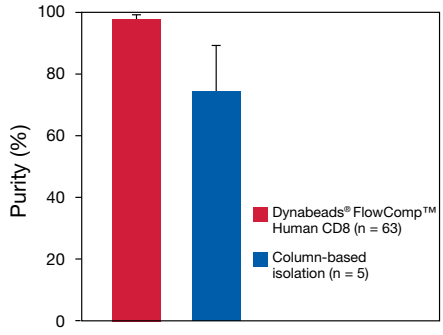


Figure 4. Isolation of $CD8^+$ T cells from peripheral blood mononuclear cells. Isolation with Dynabeads® FlowComp™ Human CD8 gave high purity and minimal performance variations.

"Love it; looks like over 90% recovery for the Dynabeads® FlowComp™ Mouse CD4 kit, even from raw splenocytes. I definitely intend to use it."

Bindu Kanathezhath, MD
Children's Hospital and Research Center, Oakland, California USA

To learn more about the high recovery, viability, and purity you can get with Dynabeads® FlowComp™ technology, visit www.invitrogen.com/flowcomp.

Ordering information

Product	Amount processed	Cat. No.
Positive isolation of human cells		
Dynabeads® FlowComp™ Human CD4	80 mL whole blood/buffy coat*/2 x 10^9 cells	113-61D
Dynabeads® FlowComp™ Human CD8	80 mL whole blood/buffy coat*/2 x 10^9 cells	113-62D
Dynabeads® FlowComp™ Human CD3	80 mL whole blood/buffy coat*/2 x 10^9 cells	113-65D
Dynabeads® FlowComp™ Human CD14	80 mL whole blood/160 mL buffy coat/2 x 10^9 cells	113-67D
Dynabeads® FlowComp™ Human CD45RA	2 x 10^9 cells	113-68D
Positive isolation of mouse cells		
Dynabeads® FlowComp™ Mouse CD4	2 x 10^9 cells	114-61D
Dynabeads® FlowComp™ Mouse CD8	2 x 10^9 cells	114-62D
Dynabeads® FlowComp™ Mouse Pan T (CD90.2)	2 x 10^9 cells	114-65D
Dynabeads® FlowComp™ Mouse CD4+CD25+ Treg Cells	1 x 10^9 cells	114-63D
Dynabeads® FlowComp™ Mouse CD49b	2 x 10^9 cells	114-64D
Related products		
Dynabeads® FlowComp™ Flexi	2 x 10^9 cells	110-61D
DynaMag™ magnets	See www.invitrogen.com/magnets for magnet recommendations.	
HulaMixer™ Sample Mixer	1 unit, holds 0.5 mL–50 mL tubes	159-20D

* For isolation from buffy coat, contact Technical Support for specific protocols.
For current prices, please visit www.invitrogen.com.

Visit www.invitrogen.com/immunology for relevant antibodies, cell expansion technology, and flow cytometry reagents.

References

1. Pisanic TR II et al. (2007) Nanotoxicity of iron oxide nanoparticle internalization in growing neurons. *Biomaterials* 28:2572–2581.
2. Berry, CC et al. (2004) Cell response to dextran-derivatised iron oxide nanoparticles post internalisation. *Biomaterials* 25:5405–5413.
3. Feng X et al. (2010) Foxp1 is an essential transcriptional regulator for the generation of quiescent naive T cells during thymocyte development. *Blood* 115(3):510–518.
4. Del Cacho E et al. (2009) Avian follicular and interdigitating dendritic cells: Isolation and morphologic, phenotypic, and functional analyses. *Vet Immunol Immunopathol* 129:66–75.
5. Wang J et al. (2009) De novo generation and enhanced suppression of human CD4+CD25+ regulatory T cells by retinoic acid. *J Immunol* 183:4119–4126.
6. Brody JD et al. (2009) Immunotransplantation preferentially expands T-effector cells over T-regulatory cells and cures large lymphoma tumors. *Blood* 113(1):85–94.
7. Huber SA (2009) Depletion of γδ+ T cells increases CD4+ FoxP3 (T regulatory) cell response in coxsackievirus B3-induced myocarditis. *Immunology* 127:567–576.

MAKE THE MOST OF EVERY CELL

DYNAL® has pioneered magnetic separation technologies for biological discovery that are both simple and highly reproducible. Based on their patented superparamagnetic, monodisperse beads, Dynabeads® technologies represent a superior paradigm for cell and biomolecule separation in a wide range of basic and clinical research applications, diagnostic assays, and therapeutic protocols.

invitrogen™ | DYNAL®

www.invitrogen.com