FLUIDIGM®

High-Plex. High-Throughput.

Sample multiplexing by cell barcoding for CyTOF

Streamline workflows and improve staining consistency with sample-specific cell barcoding.

Cell barcoding tags each sample with a unique identifier, enabling sample multiplexing for improved workflows and enhanced data quality.

Barcoded samples are stained together in a single tube, eliminating staining variability between samples and reducing antibody and reagent use. Acquisition time is faster, requiring only a single run of the multiplexed sample.

With cell barcoding, you can achieve higher sample throughput for scaled-up experiments and improved data consistency for large studies.

1	2	3	4	5
Barcode individual samples.	**Pool** barcoded samples into a signle tube.	**Stain.**	**Acquire** on Helios™.	**Debarcode data.**

Standard workflow for barcoding. Individual samples are barcoded with a unique metal isotope code and combined with other samples for staining and acquisition as a single multiplexed sample. Data are debarcoded with CyTOF® software for individual sample analysis.

Examples of barcoding in the literature

- Optimized mass-tag cell barcoding using palladium-based cell labeling and doublet-filtering scheme[1,2]
- Streamlined workflow for up to 80 clinical samples with mass-tag cell barcoding[3]
- Cell surface CD45 staining approach to barcode up to 20 PBMC samples prior to surface and intracellular staining[4]
- Staining and analysis of three tissue types simultaneously using anti-CD45 barcoding strategy[5]

Benefits of barcoding

Accessibility—Uses isotopes and workflows that are compatible with existing panel designs

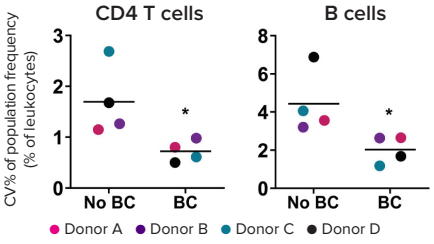
Scaled up experiments—Reduces processing time in experimental workflow, making it easier to increase sample throughput

Sample conservation—Enables efficient use of precious samples by allowing you to combine many samples in one tube

Increased consistency—Eliminates sample-to-sample variation introduced when samples are stained and collected individually

Cleaner data—Filters intersample cell doublets and multiplets by detecting more than one barcode per cell

Reagent savings—More economic use and lower usage of antibodies and reagents



Barcoding improves staining consistency. Data from replicates of the same sample are compared between no barcoding (No BC) and barcoding (BC) protocols. Each point represents the CV% of five technical replicates per donor, and the horizontal line represents the grand mean of CV% per protocol.

Universal cell multiplexing with palladium-based barcodes

Easily combine up to 20 samples with ready-to-use kit.

The Cell-ID™ 20-Plex Pd Barcoding Kit (PN 201060) uses a combination of three of six stable palladium (Pd) isotopes to identify up to 20 fixed and permeabilized samples of any cell type, independent of species.

The kit combines the necessary reagents and barcoding tags to let you integrate barcoding into your next experiment. This method is compatible with downstream staining of surface, intracellular, nuclear and phosphorylated antigen targets that are not affected by fixation.

See the Benefits of Palladium Barcoding Application Note (FLDM-00012) for more information.

All-in-one universal cell barcoding kit. Contents include 3 sets of 20 Pd barcodes, buffers and solution.

Live-cell barcoding for more human leukocyte multiplexing options

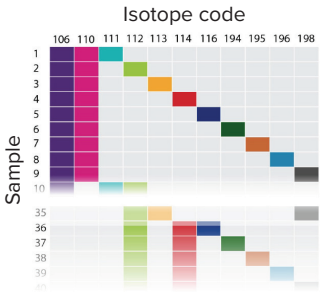
Scale up translational and clinical studies by barcoding 35 or more samples.

For customized multiplexing capability, live-cell barcoding is a flexible option that lets you vastly increase your multiplexing power to 35 samples or more.

Live-cell barcoding labels human white blood cell samples with anti-CD45 (a pan-leukocyte marker) antibodies selected from our catalog.

Choose from 7 cadmium and 4 monoisotopic cisplatin antibodies, or a combination of these, for greater flexibility to integrate barcoding with your panels and scale-up experiments.

See the technical note on best practices for using monoisotopic cisplatin-labeled antibodies for more information.



Example custom barcoding design. A 50-plus-plex design using an 11-choose-3 live-cell barcoding scheme combining CD45 antibodies conjugated with cadmium (106, 110–114, 116) and cisplatin (194–196, 198).

Choosing the right barcoding method for your research needs

Barcode Method	Advantages	Considerations
Palladium-based barcoding Cell-ID 20-Plex Pd Barcoding Kit (PN 201060)	• Universal, cell-agnostic • Ready-to-use kit and accompanying software • Unique tags allow maximum antibody panel size.	• Adjustments to existing panels or workflows may be needed due to fix/perm step.
Live-cell barcoding Maxpar® anti-CD45 antibodies	• No fix/perm step required. Fix-sensitive epitopes are preserved. • Easily add to existing panels • Flexible design allows scaling for sample number to 50-plus.	• Barcoding scheme designed manually • Best for blood leukocytes, CD45-negative cells excluded

Speak with a technical support specialist about cell barcoding by visiting **fluidigm.com/support**

1. Behbehani, G.K. et al. *Cytometry Part A* 85 (2014): 1,011–1,019
2. Zunder, E.R. et al. *Nature Protocols* 10 (2015): 316–333
3. Thrash, E.M. et al. *STAR Protocols* 1 (2020): 100055
4. Mei, H.E. et al. *Journal of Immunology* 194 (2015): 2,022–2,031
5. Lavin, Y. et al. *Cell* 169 (2017): P750–765.E17

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