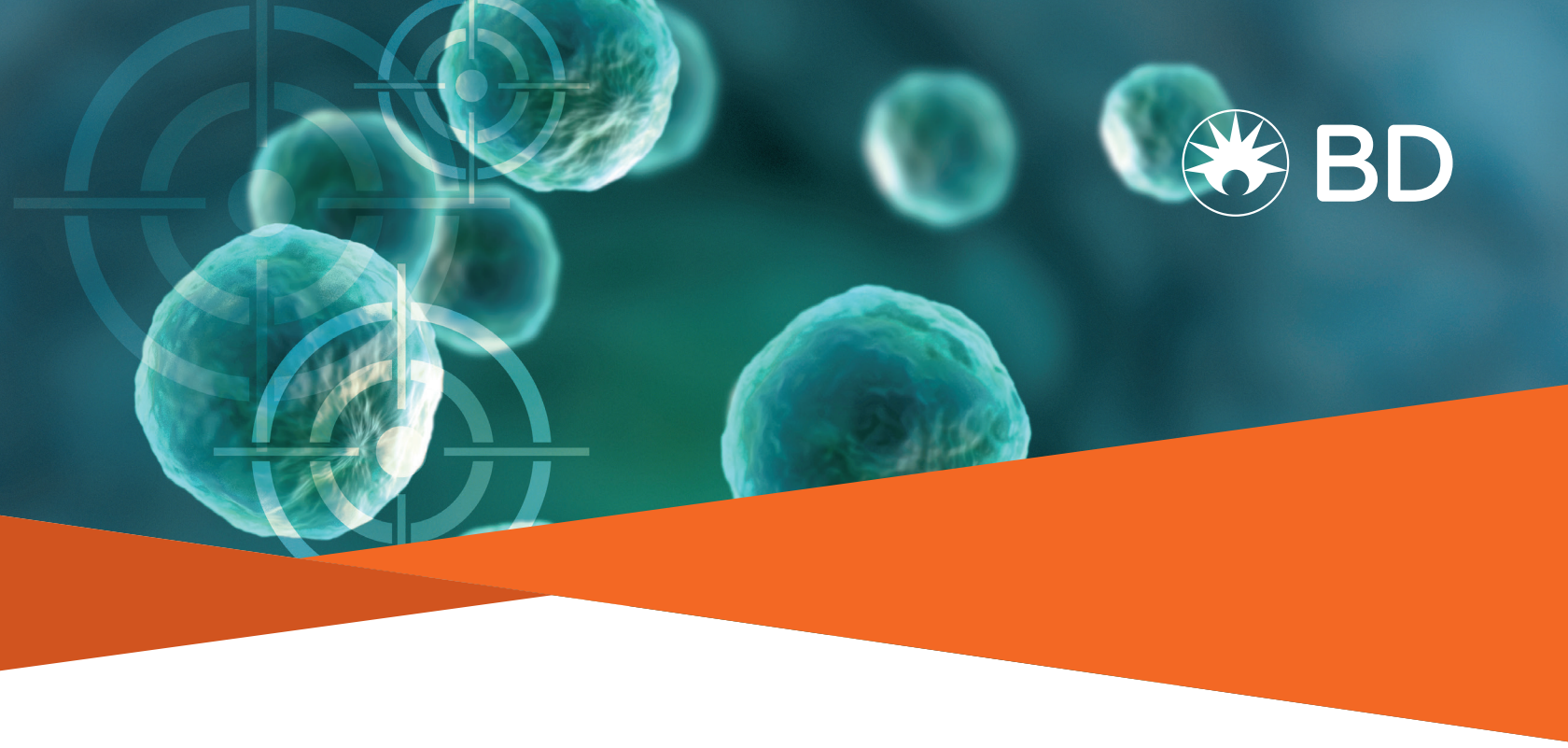
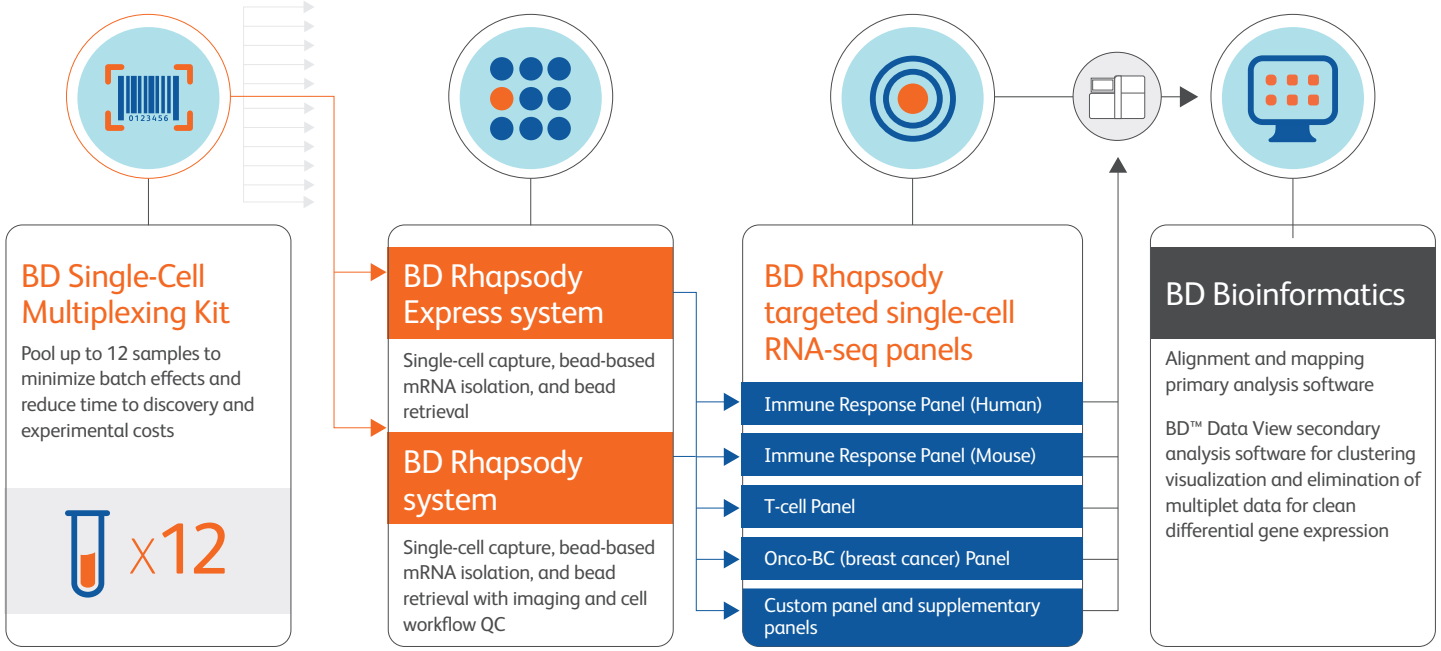


Customize your single-cell experiments with BD targeted RNA-Seq and multiplexing technologies

The BD Rhapsody™ portfolio of products helps you answer biological questions with a sensitive, targeted approach to single-cell analysis. Researchers can interrogate gene expression from hundreds to tens of thousands of single cells from one or multiple samples simultaneously.



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The BD Rhapsody Single-Cell Analysis system: Analyze hundreds of genes across tens of thousands of single cells in parallel

The system enables high-throughput single-cell RNA-Seq analyses starting from single-cell suspensions. It supports your research in numerous ways:

- Targeted assays provide improved detection sensitivity at a fraction of the time and cost of whole transcriptome amplification (WTA)
- The optically clear cartridge-based technology allows for visualization during the workflow to ensure maximal experimental control
- Enhanced data quality due to fewer multiplet events than equivalent droplet-based WTA assays for a fixed cell load
- BD Molecular Indexing technology counts RNA molecules to give you quantitative gene expression readouts in sequencing
- The scanner provides valuable information about cell counts and viability by simple automatic imaging during the multiple QC steps of the process
- The system is compatible with upstream BD cell-enrichment technologies, for example, fluorescence-activated cell sorting with the BD FACSMelody™ cell sorter

What can the BD Rhapsody scanner do for you?

The BD Rhapsody scanner provides automated cell counting, quality analysis of cell samples, and helps prepare samples at optimal concentrations for single-cell capture on the BD Rhapsody cartridge. This is extremely valuable when working with precious samples as you obtain single-cell capture metrics in the first step of single-cell sequencing. Some of the features of the scanner are:

- Automated counts of cells captured with beads on the cartridge
- QC images taken at multiple points in the capture and tagging process
- Eliminates tedious manual cell counting with automated cell calculations that allow you to load correct cell volumes from multiple samples for multiplexing on the cartridge
- Multiplet detection via imaging rather than in sequencing

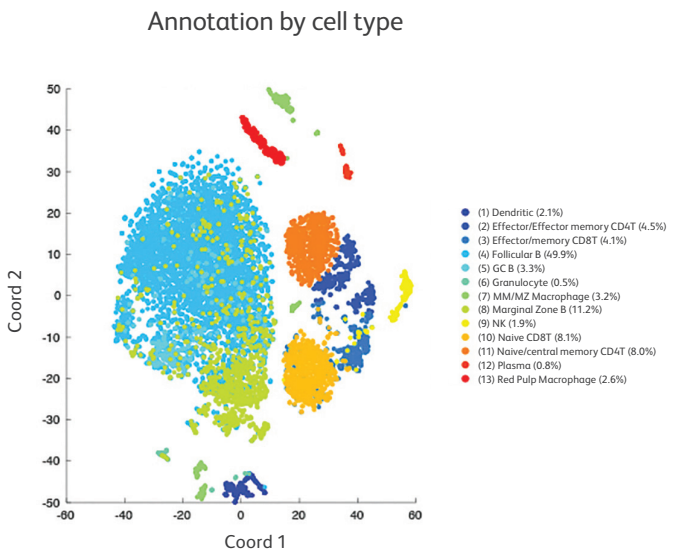

Figure 1. BD Rhapsody and BD Rhapsody Express workflows allow for high quality clustering of primary cell types and reproducibility between methods. A mouse spleen was mechanically dissociated into a single-cell suspension. ~5000 cells were loaded into two BD Rhapsody cartridges and subjected to the BD Rhapsody or BD Rhapsody Express workflow in parallel. Single-cell targeted RNA-seq libraries were prepared with the BD Rhapsody Immune Response Targeted Panel (Mouse) and sequenced with equivalent depth. t-SNE projection of cells from the BD Rhapsody and BD Rhapsody Express workflow, annotated by cell type. Gene-gene correlation for both Rhapsody and BD Rhapsody Express workflows for this experiment demonstrates no appreciable batch effects, R^2= 0.974.

The BD Rhapsody Express system: Personal, bench-side assays for targeted single-cell RNA-Seq analysis.

- The BD Rhapsody Express system provides a decentralized, portable option that eliminates the need to move to a core lab or wait in a queue for an instrument to prepare precious primary samples
- No electronics required, lightweight, and dependable
- The technology is the same as the BD Rhapsody system, but the workflow is designed and optimized without the need for the scanner hardware, providing a low-cost way for researchers to enter the single-cell RNA world or supplement and round out their RNA-Seq research tools

Regardless of the option you choose, you can be assured of high quality data between the two BD Rhapsody system workflow options (Figure 1).

BD Rhapsody targeted panels

Targeted gene expression assays are an efficient way to screen hundreds of genes at once that provide a cost-effective, more sensitive detection of low abundant transcripts than WTA assays **(Figure 2)**. With this targeted approach you can remove high expressers to eliminate excessive, costly sequencing reads.

- BD Rhapsody pre-designed targeted panels include:
  - Onco-BC panel (human) for breast cancer oncology research
  - Immune response panels (human or mouse)
  - T-cell panel (human)
- Custom panels: Request a panel for up to 500 of your gene targets of interest; the BD Bioinformatics service can generate a custom panel from your WTA findings or favorite gene lists
- Supplemental panels: Add up to 100 targets to any BD predesigned panels or custom panel

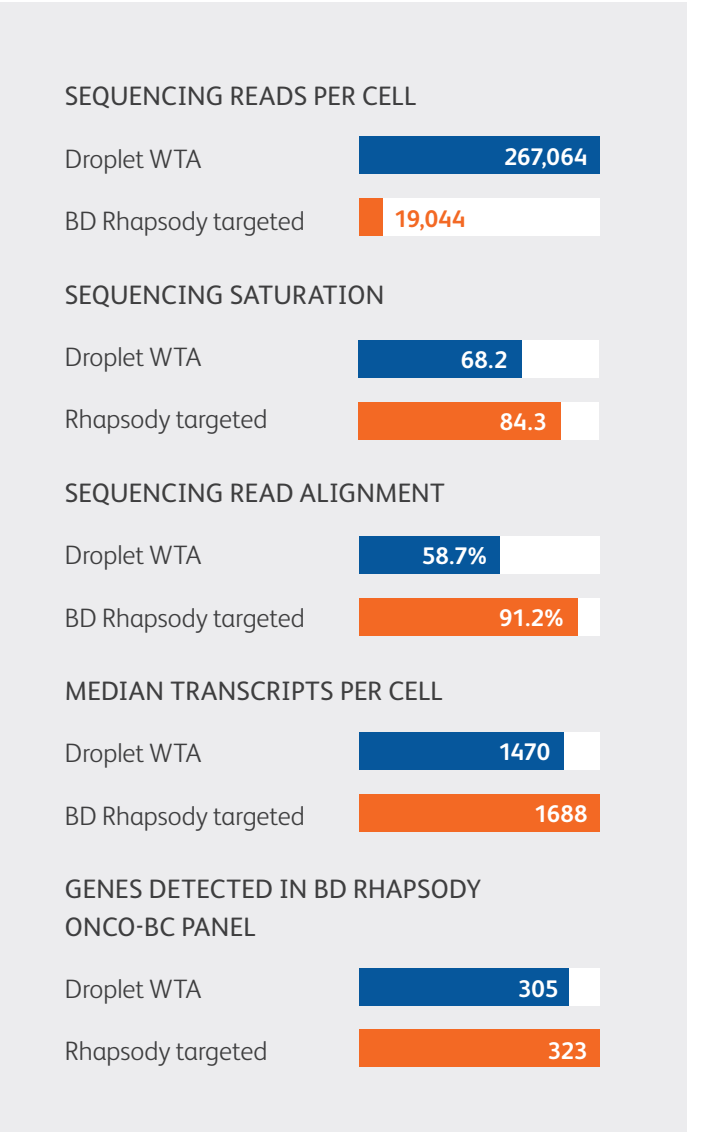

Figure 2: The BD Rhapsody targeted assays provide higher sensitivity with lower sequencing cost BT549 and Ramos cells were mixed at a 1:1 ratio and pooled into either a BD Rhapsody system or a commercially available WTA droplet-based system. The cells captured from the BD Rhapsody system were subsampled to match the number of cells captured in the droplet-based capture system prior to library preparation. NGS libraries were generated from the BD Rhapsody system using the BD Rhapsody Targeted Onco-BC panel and compared with WTA libraries derived from the droplet-based method. The WTA libraries were sequenced to ~250,000 reads per cell and the BD Rhapsody libraries were sequenced to ~20,000 reads per cell. With significantly fewer reads per cell, the targeted workflow achieved higher sequencing saturation and outperformed the WTA workflow in percentage read alignment, number of transcripts per cell and number of genes identified. Genes of interest were identified more readily and with less sequencing requirement with a targeted approach as compared to a WTA method.

BD Rhapsody targeted, customizable panels allow you to focus on the genes that really matter, including rare transcripts.

Cell hash with the BD Single-Cell Multiplexing kit to reduce experiment costs and enhance data quality

BD™ Single-Cell Multiplexing Kit

Instead of running one sample per single-cell capture, researchers can now run up to 12 in one using the BD Single-Cell Multiplexing kit. This kit allows you to customize your experiments by choosing between 1 to 12 samples at once on a BD Rhapsody cartridge or other compatible system using an antibody-oligo conjugate to stain each individual sample. Multiplexing samples allows you to not only improve data quality, but drastically reduce cost per run.

Benefits of the kit include:

- Allows for inter-sample multiplet detection and removal in analysis
- Pools up to 12 samples together to reduce experiment costs
- Lowers technical errors between samples by reducing batch effects
- Integrates easily into standard RNA-Seq workflow via the upstream antibody-labeling step
- Compatible with the 10X Genomics® Chromium™ system and other droplet-based 3' solutions

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