BD Rhapsody™ Immune Response Targeted Panel (Mouse)

Targeted mouse immune gene panel for the BD Rhapsody Single-Cell Analysis System

- Validated panel focuses on genes relevant to phenotyping immune cells
- Targeted sequencing approach requires dramatically fewer reads than a 3' whole transcriptome sequencing approach
- Reproducible assay empowers numerous applications

The immune system is an intricate defense network of organs and cell types that protect against pathogens, environmental antigens and cancer. The immune response consists of complex interactions of several cell types. These cells are involved in surveillance and recognition of foreign pathogens or cells, secretion and recruitment of inflammatory signals, coordination and expansion of specific adaptive immune cells, and maturation of adaptive cells for immune memory and antibody production. Understanding how these processes function normally and in instances of dysregulation are fundamental to understanding mechanisms of disease, such as inflammation, infection and cancer.

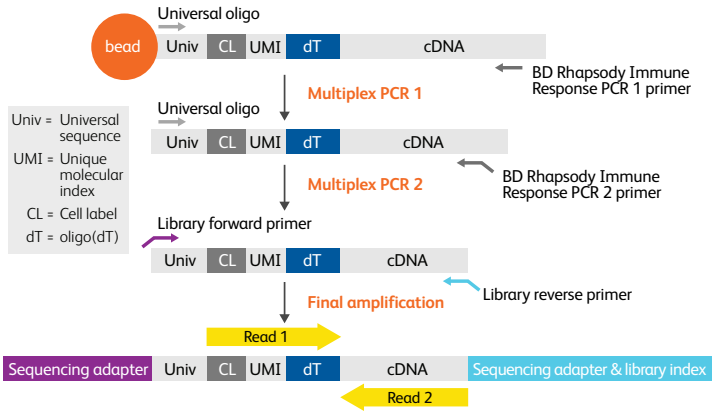

Figure 1. cDNA synthesis and library construction chemistry using the BD Rhapsody Immune Response Targeted Panel (Mouse).

The BD Rhapsody™ Immune Response Targeted Panel (Mouse) is an assay for single-cell research of the mouse immune system with the BD Rhapsody Single-Cell Analysis System. The panel provides for cost efficient cellular phenotyping of single cells. Researchers interested in immunology, translational research, or drug development gain a powerful tool to identify, explore and understand immune cell function.

Expertly designed panels give you the right genes

Drawing from BD's 40 years of experience in immunology, the panel content was chosen to compromise relevant phenotypic markers, including those routinely used in FACS analysis. The panel includes genes related to cytokine and chemokine secretion, interleukin signaling and transcription factors involved in cell differentiation and maturation. Panel content was specifically developed to amplify transcripts relevant to immune cell function, rather than low variance, highly expressed genes (e.g. ribosomal genes). This focused approach to sequencing dramatically improves assay efficiency, compared to a whole transcriptome assay. Targeted approaches save both sequencing costs and analysis time, allowing researchers to better utilize resources for other immune studies.

Tailored libraries for targeted sequencing

The BD Rhapsody Immune Response Targeted Panel (Mouse) utilizes multiplex PCR for detecting 397 genes. After cells are lysed in the BD Rhapsody Cartridge, beads containing captured mRNA are magnetically retrieved for cDNA synthesis. Included primers are used for several rounds of gene-specific nested PCR

for library construction. The final PCR amplification products for sequencing contains sequencing adapters, a cell label, unique molecular index (UMI) and up to 400 bp of the 3' end of the target gene. Assay products can be sequenced on Illumina MiSeq, NextSeq, HiSeq2500 and HiSeq4000 sequencers.

Your target genes, delivered your way

For exploring genes beyond the panel, the mouse immune response assay allows customization by adding user-defined genes. You may select up to 100 additional genes as a BD Rhapsody Supplemental Panel. Using BD's primer design software, primers for supplemental gene targets are designed to be compatible with pre-designed base panels. Supplemental primers are shipped to you and combined with the BD Rhapsody Immune Response Targeted Panel (Mouse) for library preparation.

Table 1: Example genes by category

Pathway	# of genes in panel
CD marker	47
Cell type-specific marker	30
Chemokine/chemokine receptor, cytokine/cytokine receptor	60
Immunoglobulin	12
Interleukin	34
Other*	214

* Apoptosis regulator; cell adhesion; cell cycle; complement protein; effector molecule; enzyme; G-protein coupled receptor; growth factor; immune checkpoint; immune receptor; integrin; kinase; metabolism; MHC class I or II; NK-cell receptor; nuclear receptor; stress response; toll-like receptor; transcription factor; transporter

Expression profiling of the single cell

To show the performance of the BD Rhapsody Immune Response Targeted Panel (Mouse), 1179 cells obtained from a freshly dissociated mouse spleen were profiled using the BD Rhapsody System. Major immune cell populations of the mouse spleen were readily detected. The BD Rhapsody Immune Response Targeted Panel provides resolution of niche immune cell subsets, such as follicular, germinal center, and marginal zone B cells, as well as MM/MZ and red pulp macrophages.

Learn more about the power of targeted single-cell analysis

The BD Rhapsody Immune Response Targeted Panel (Mouse) shows validated, reproducible and reliable dissection of immune response cell subsets, useful for exploring cell types in a wide variety of applications. Contact us to learn what this panel and the BD Rhapsody System can do for your research.

Table 2: BD Rhapsody Immune Response Targeted Panel (Mouse) metrics

Total reads recommended per cell	
For cell type identification	2K
For direct comparison across samples	20K
# of genes in panel	397

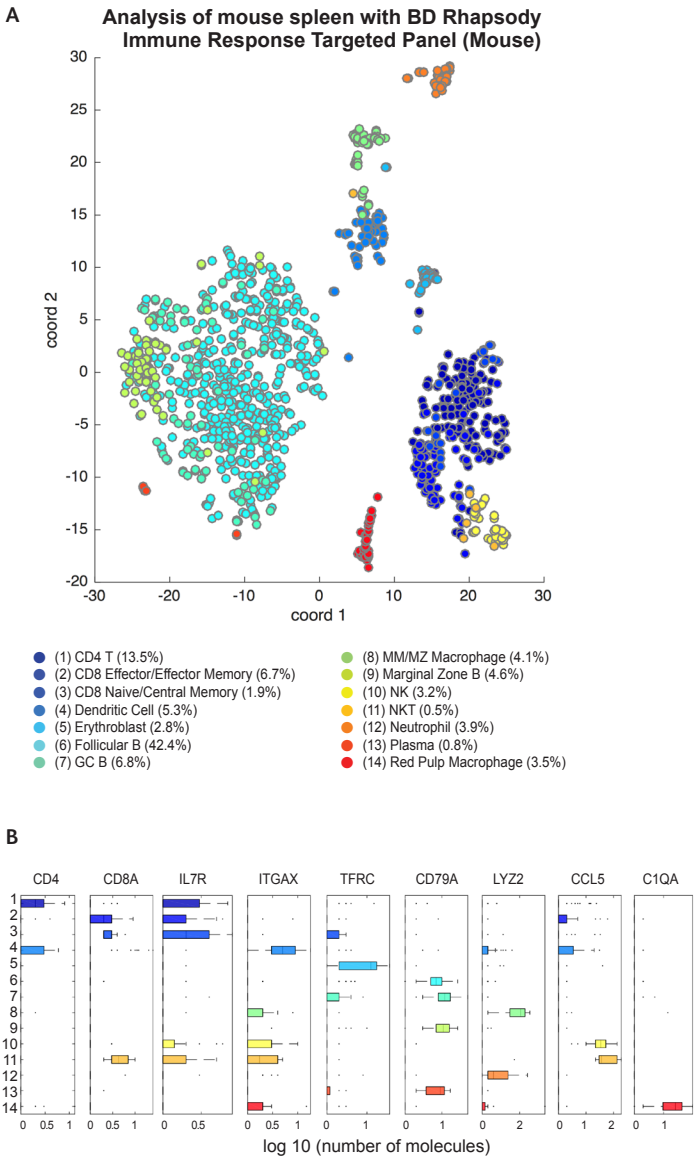

Figure 2. Example data of the BD Rhapsody Immune Response Targeted Panel (Mouse). (a) tSNE projection of 1179 cells derived from mouse spleen, annotated by cell type. (b) Box plots of marker gene expression for each major cell type.

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