

69 IMMUNOPHENOTYPING OF TCR AND BCR CLONOTYPES

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Background T-cell receptor (TCR) and B-cell receptor (BCR) repertoire profiling holds great potential for understanding disease mechanisms and for the development of new therapeutics in infectious diseases, autoimmunity and in immuno-oncology. However, this potential could be greatly improved by combining information about receptor clonotypes with immuno-phenotypes of T and B cells.

Methods To facilitate these studies, we developed a novel technology for combined profiling of all human TCR and BCR variable regions and phenotypic characterization of immune cells in bulk and at the single-cell level in PBMC and immune cell fraction samples. The developed TCR/BCR Immunophenotyping method involves multiplex RT-PCR amplification and sequencing of CDR3 regions of TCR and BCR genes and a set of the most informative T- and B-cell phenotyping genes. Bioinformatics analysis of NGS data allows profiling of TCR/BCR clonotypes, and identification of major immune cell subtypes and their activation status.

Results Data will be presented showing how combined TCR/BCR clonotype analysis combined with targeted expression profiling of immune cells can be applied for large-scale discovery of novel cell typing and activation biomarkers in several immune-responsive model systems.

Conclusions Preliminary studies demonstrate the assay has unparalleled throughput, sensitivity, and improved cost-effectiveness for high-throughput immunity biomarker discovery applications.

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