

# Simultaneous detection and characterization of antigen-specific B cells and CD4+ and CD8+ T cell responses upon natural infection and vaccination

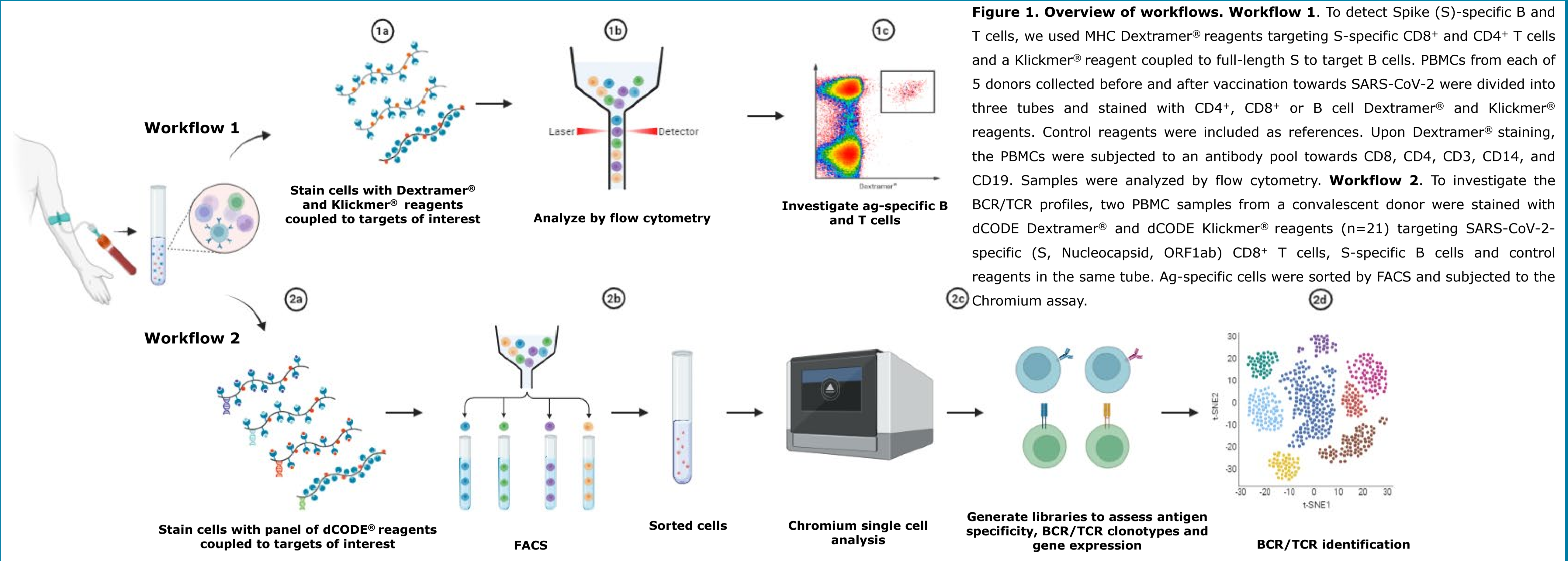
Stephen Haley<sup>1</sup>, Dilek Inekci<sup>1</sup>, Bjarke Endel Hansen<sup>1</sup> and Liselotte Brix<sup>1</sup>  
<sup>1</sup>Immudex, Copenhagen, Denmark

## Introduction

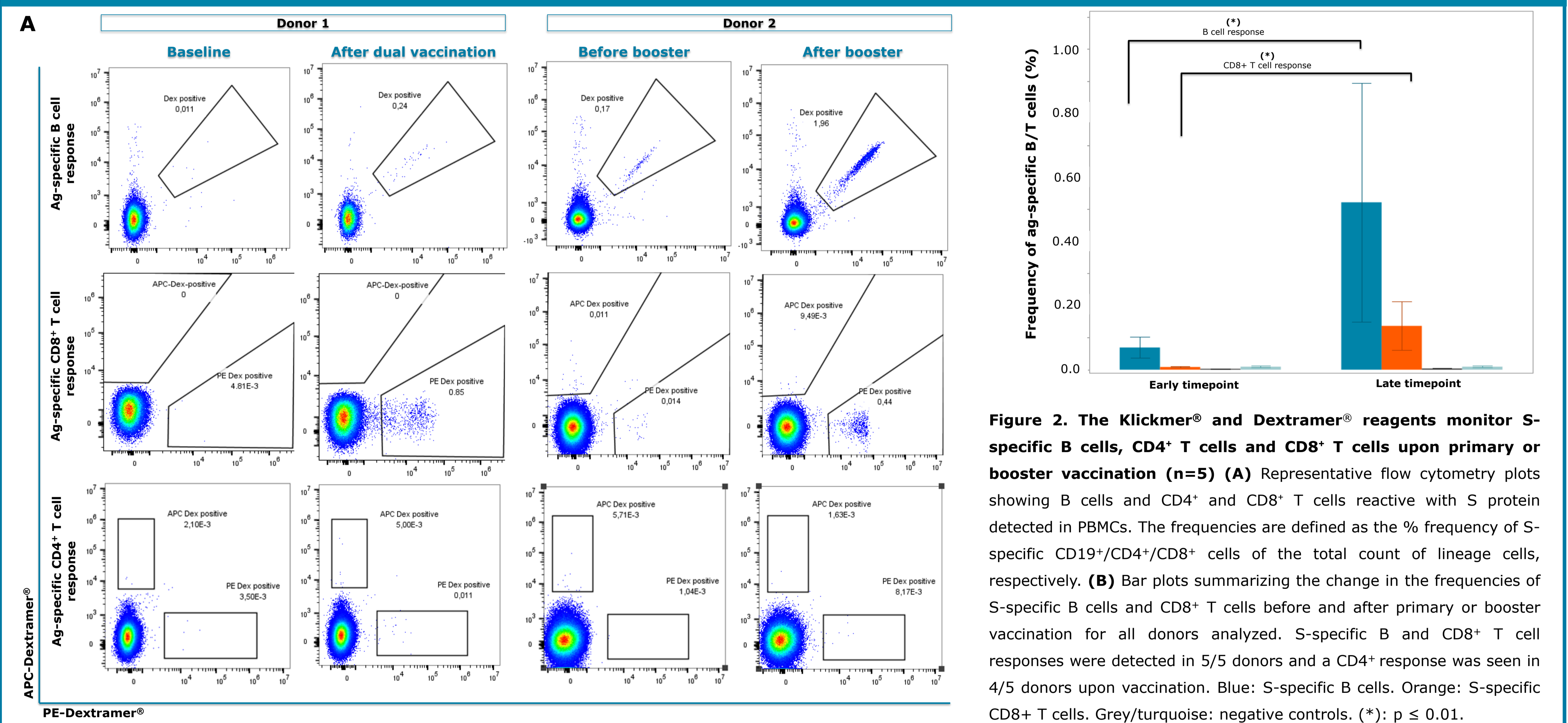
Understanding the antigen-specific B and T cell responses is key for development of vaccines and targeted therapies, encompassing various stages from target discovery to monitoring the treatment efficacy to patient stratification. The Dextramer<sup>®</sup> and Klickmer<sup>®</sup> reagents allow simultaneous detection of low-frequency ag-specific B and T cells in the same workflow. For a deeper investigation, the dCODE Dextramer<sup>®</sup> and dCODE Klickmer<sup>®</sup> reagents can be used in combination with single-cell RNA sequencing, which provides a deep dive into the ag-specific B and T cells at the individual cell level giving access to BCR/TCR sequences for specific targets.

Here we demonstrate two workflows in a SARS-CoV-2 model system for simultaneous detection of ag-specific B and T cells within the same sample using **(1)** Dextramer<sup>®</sup> and Klickmer<sup>®</sup> reagents in combination with flow cytometry or **(2)** dCODE Dextramer<sup>®</sup> and dCODE Klickmer<sup>®</sup> reagents in combination with the 10x Single-Cell Analysis System.

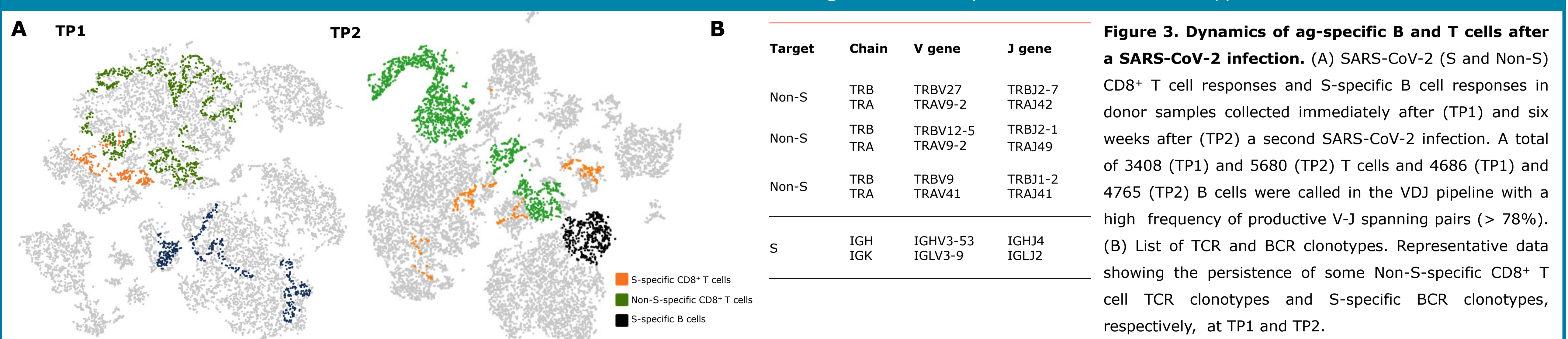
## Workflows for simultaneous investigation of antigen-specific B and T cells in blood samples



## Dextramer<sup>®</sup> and Klickmer<sup>®</sup> reagents reveal changes in magnitude and kinetics of antigen-specific B and T cells upon vaccination



## dCODE Dextramer<sup>®</sup> and dCODE Klickmer<sup>®</sup> reagents identify TCR and BCR clonotypes



## Conclusion

We have demonstrated two workflows for the simultaneous detection and characterization of ag-specific B and T cells in blood samples. **(1) Workflow 1** combines Dextramer<sup>®</sup> and Klickmer<sup>®</sup> reagents with flow cytometry to detect and characterize ag-specific B cells, CD4<sup>+</sup> and CD8<sup>+</sup> T cells. The workflow was demonstrated using SARS-CoV-2 as a model system to detect changes ag-specific B and T cells upon vaccination.

**(2) Workflow 2** combines dCODE Dextramer<sup>®</sup> and dCODE Klickmer<sup>®</sup> with single-cell RNA seq to enable the examination of T and B cells in the same sample at the individual cell level and facilitates the evaluation of specific target BCR/TCR clonotypes. We are currently exploring data in greater depth.