

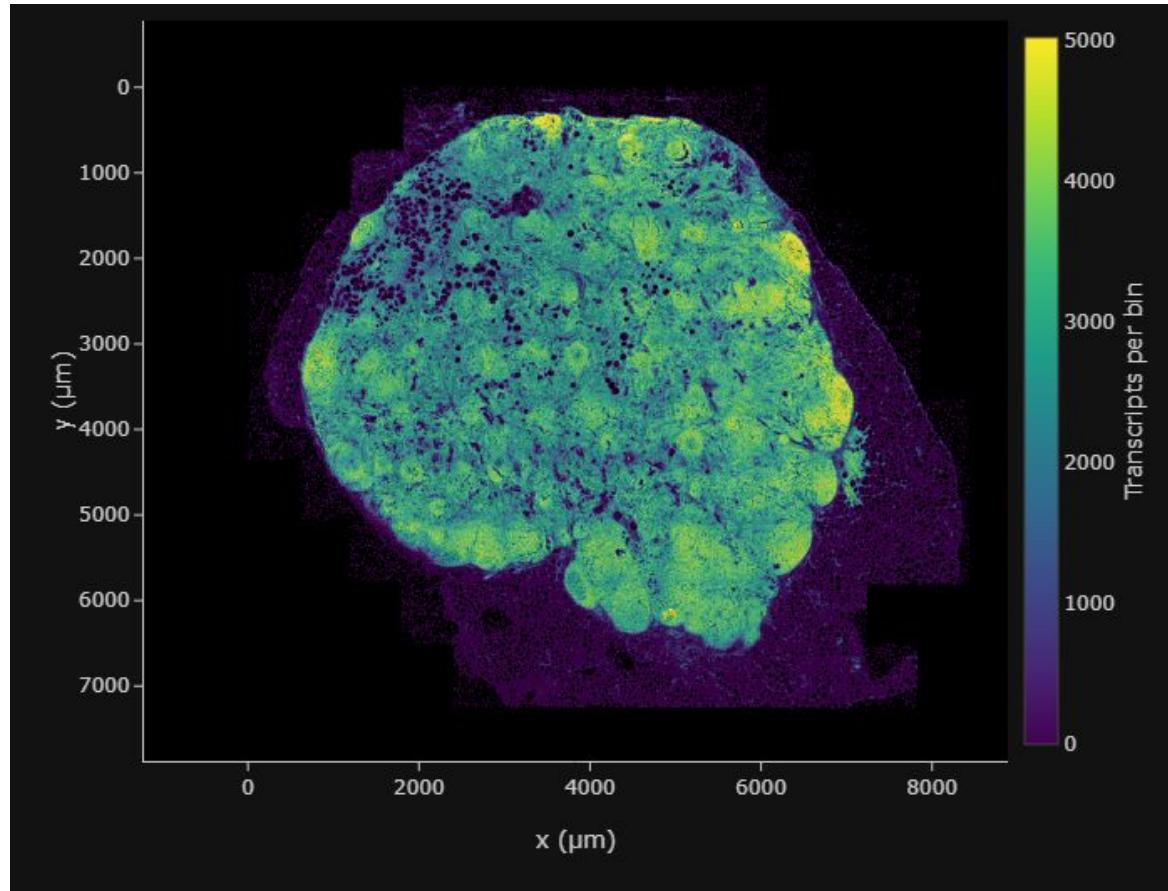
Xenium Prime 5K on lymph node

Vibe Crew
Oxford Omics Data Camp September 2024

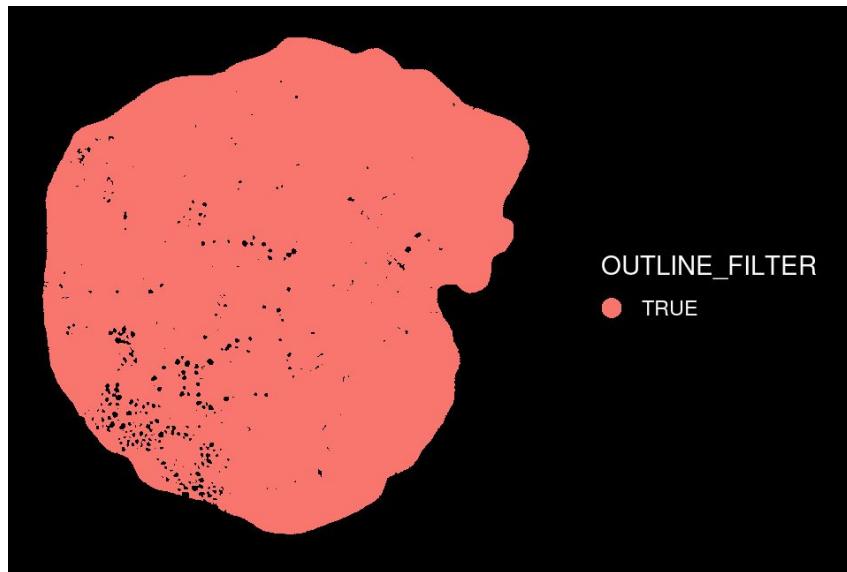
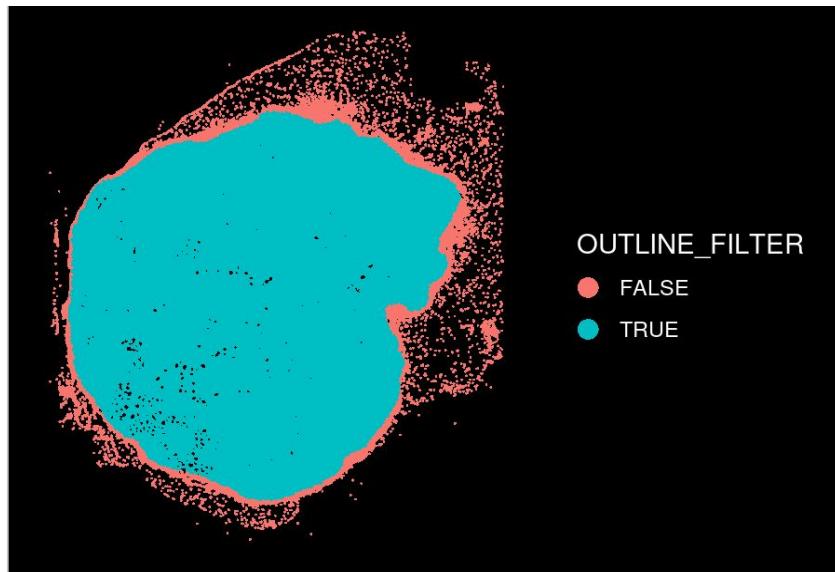
Content

- Comparison different QC approaches
- ROI selection with Xenium Explorer for further analyses
- How downsampling to 380 gene panel (ImmunoOncology) alters analyses
- Difference between niche identification based on unbiased transcriptome vs *a priori* cell annotations
- CellChat cell-cell communication analysis

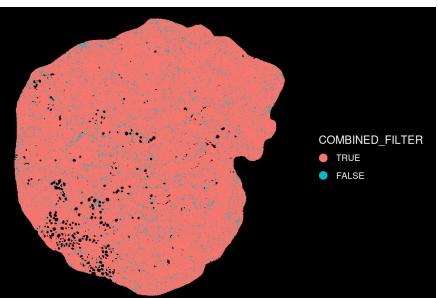
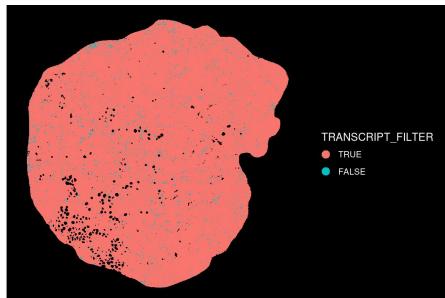
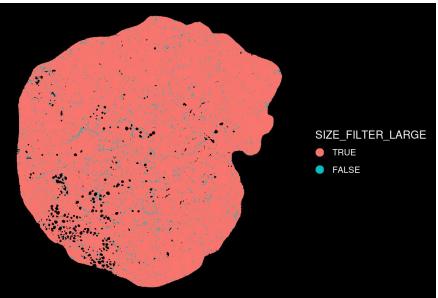
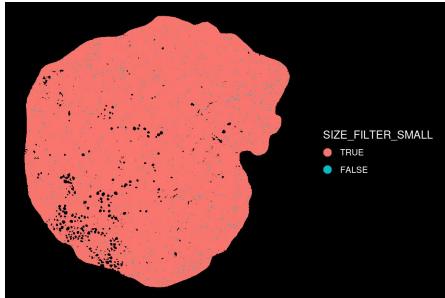
The data



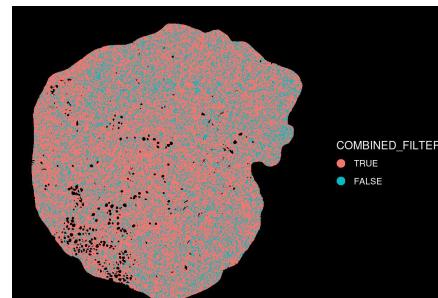
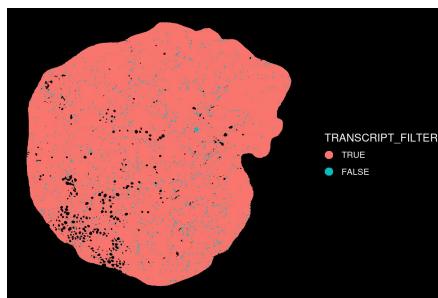
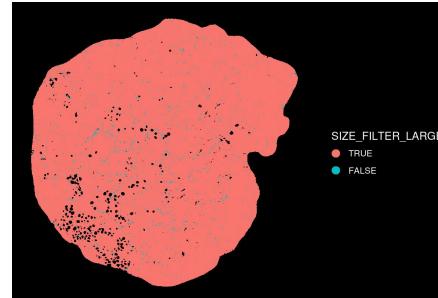
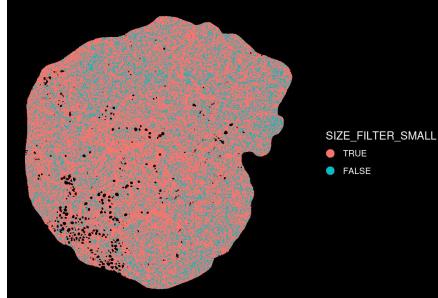
Xenium Explorer Outline Filter



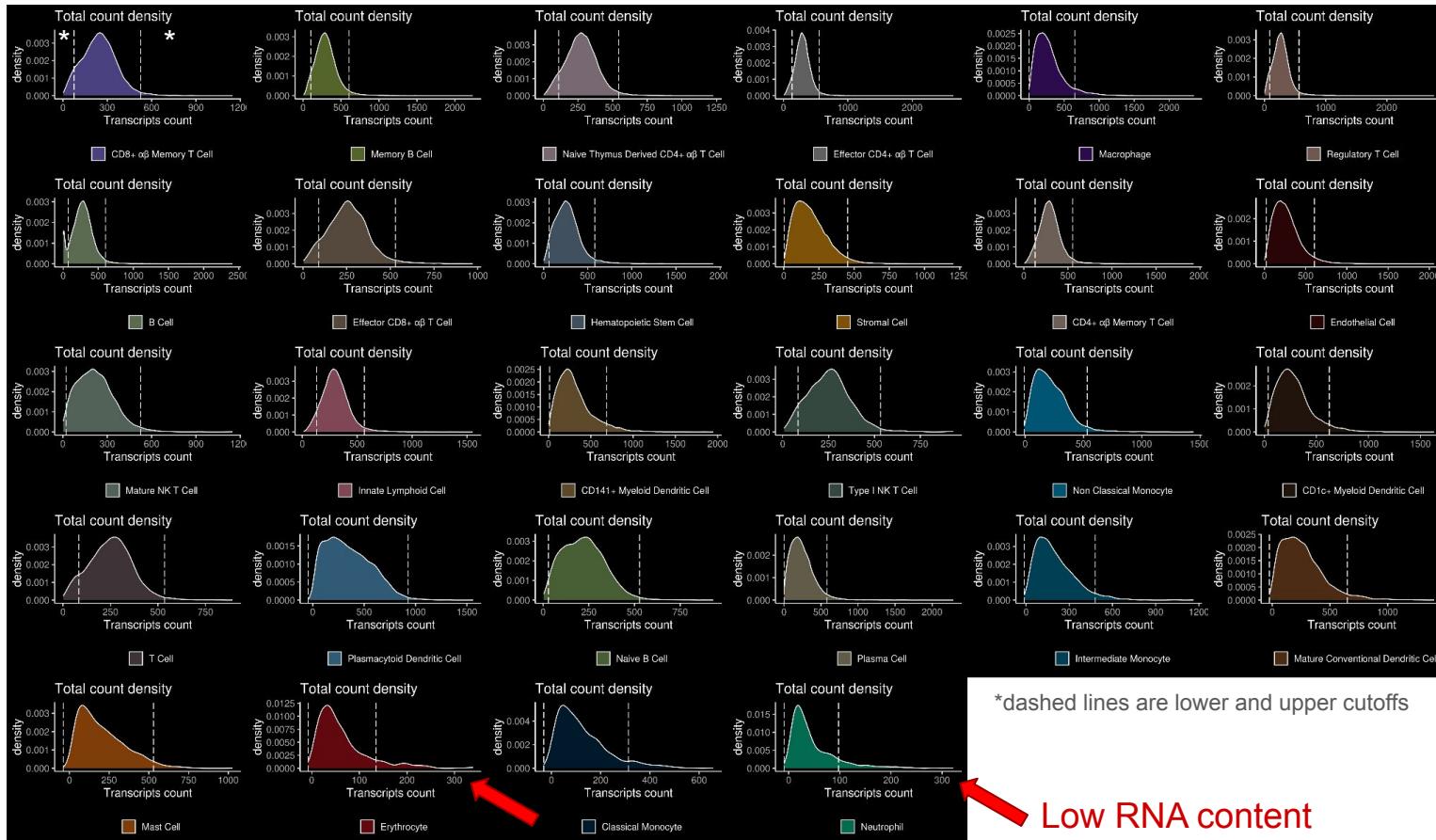
MSD Filter



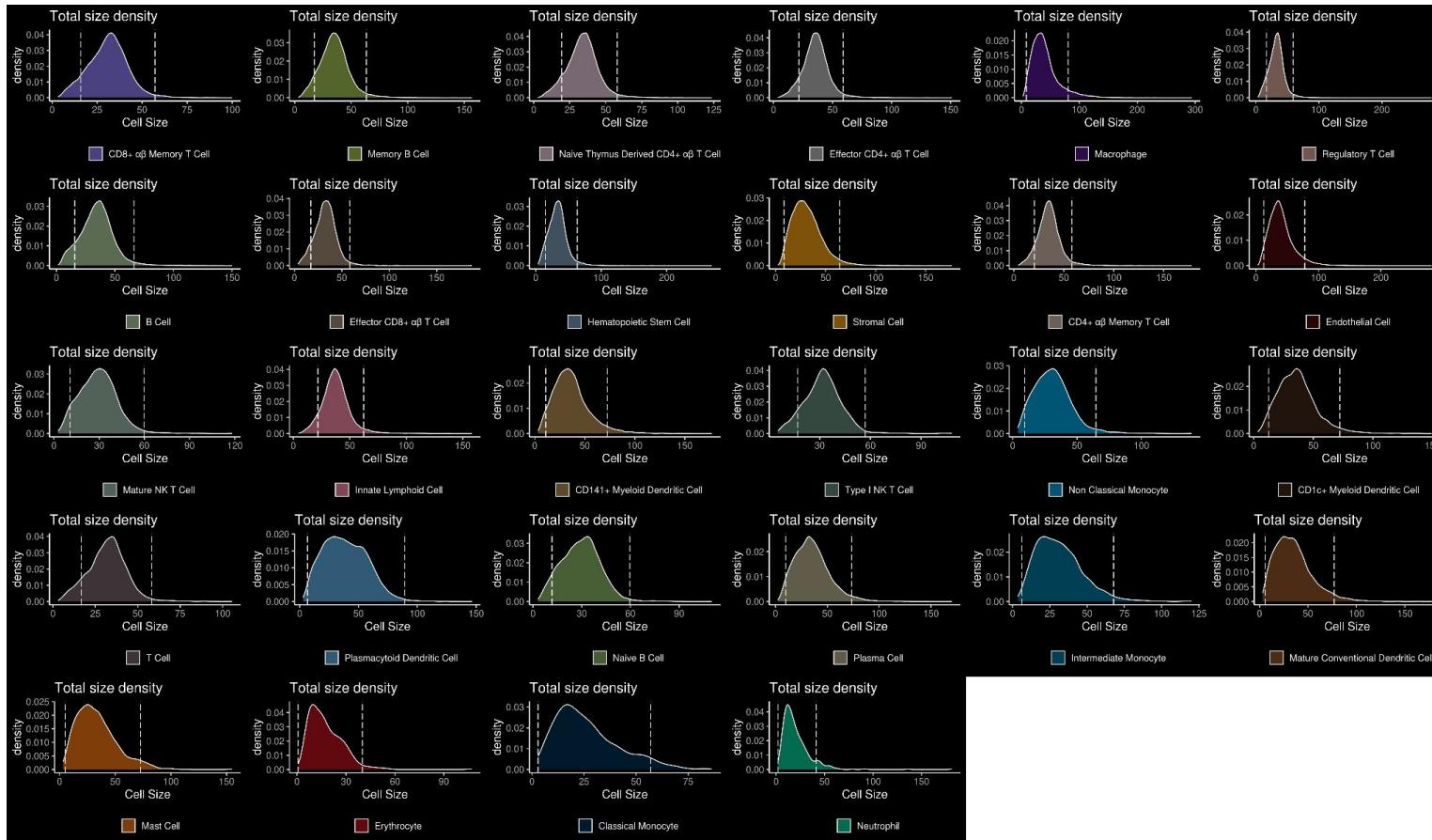
Quantiles Filter



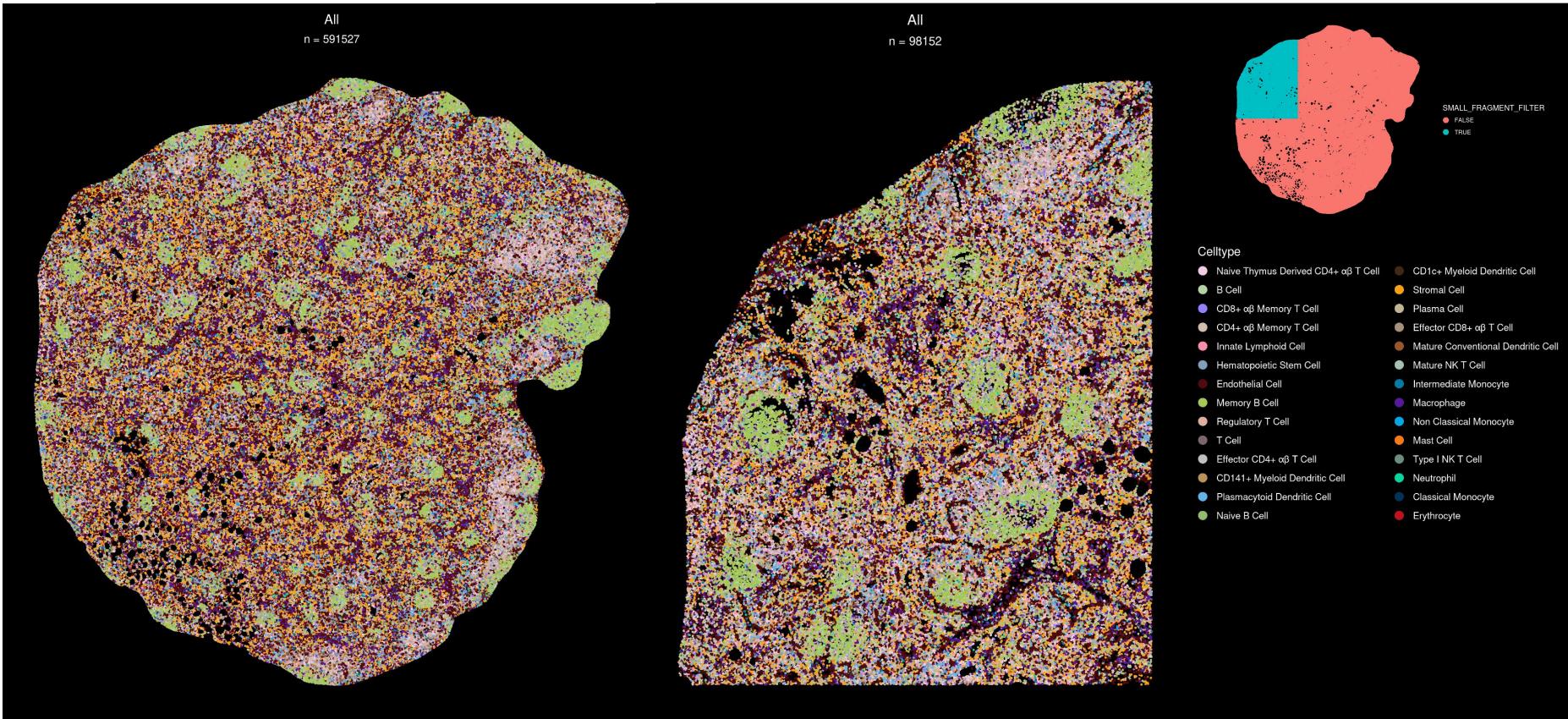
MSD filter: Distribution counts by cell types and cutoffs



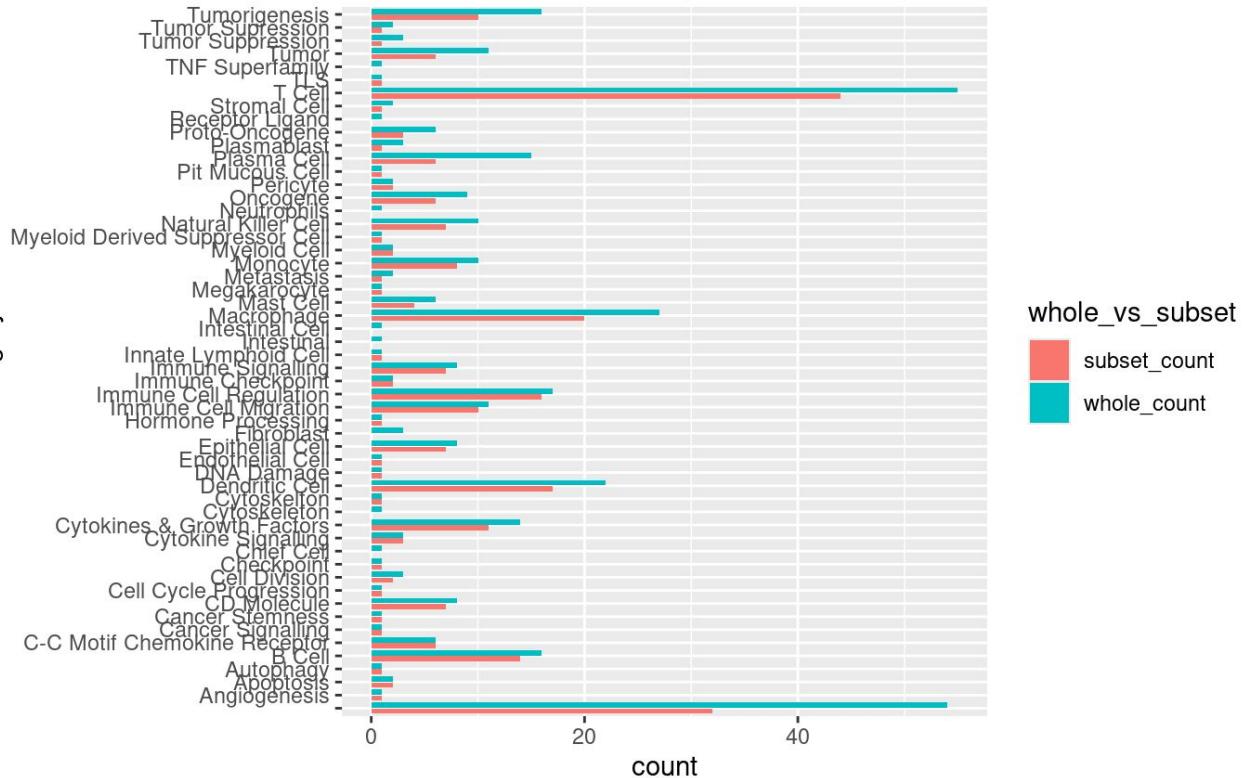
MSD filter: Distribution cell sizes by cell types and cutoffs



Cellular annotation (whole slide and section of interest)



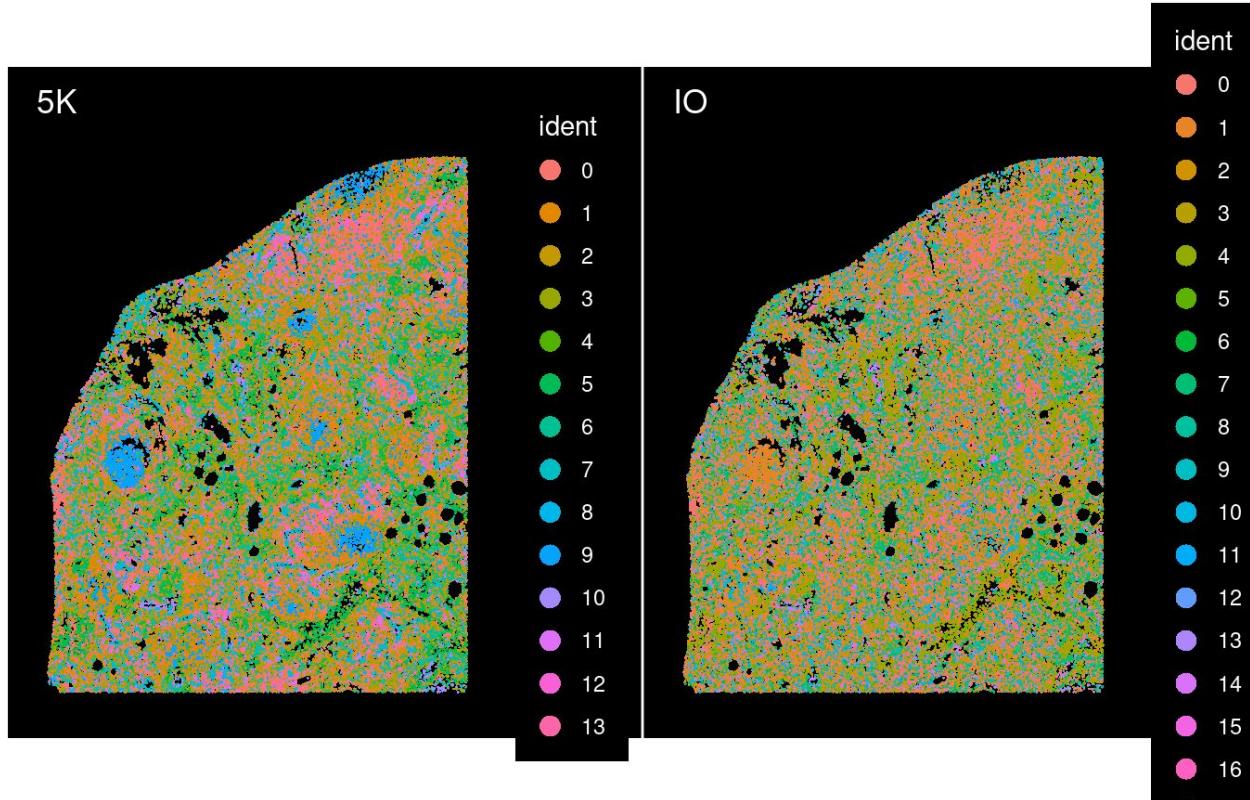
Changing number of genes: 5K vs. ImmunoOnc



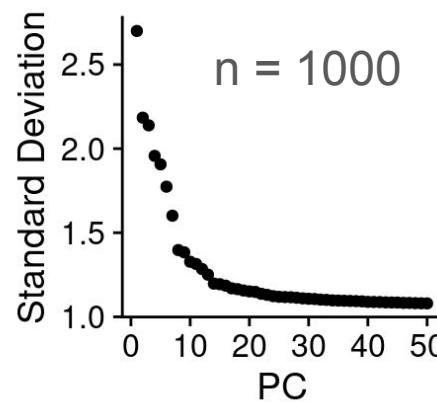
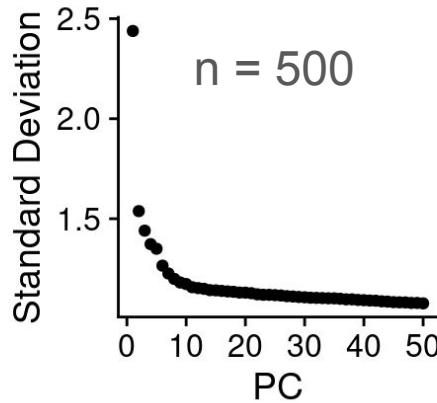
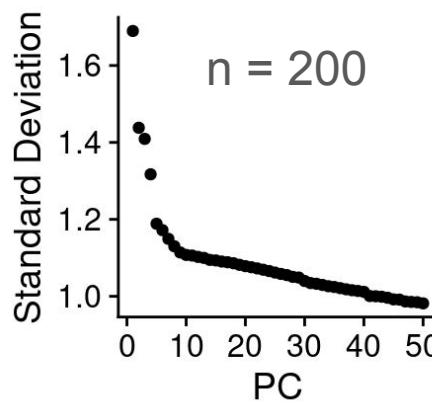
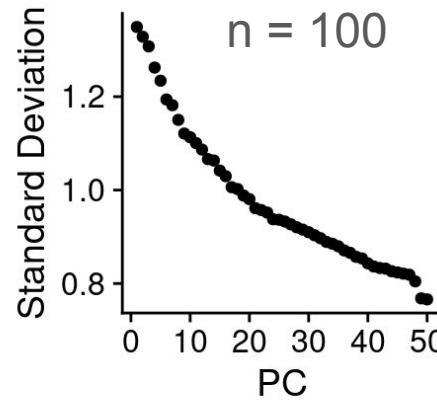
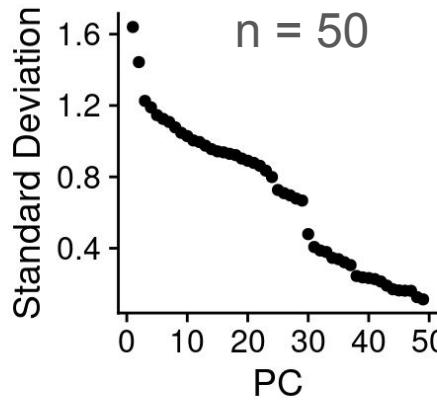
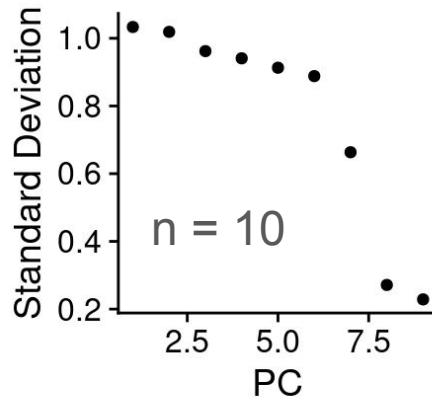
Categories from IO panel not represented in 5K:

- Cytoskeleton
- Receptor ligand
- Fibroblast
- TNF superfamily
- Chief cell
- Intestinal cell
- Neutrophil
- Intestinal

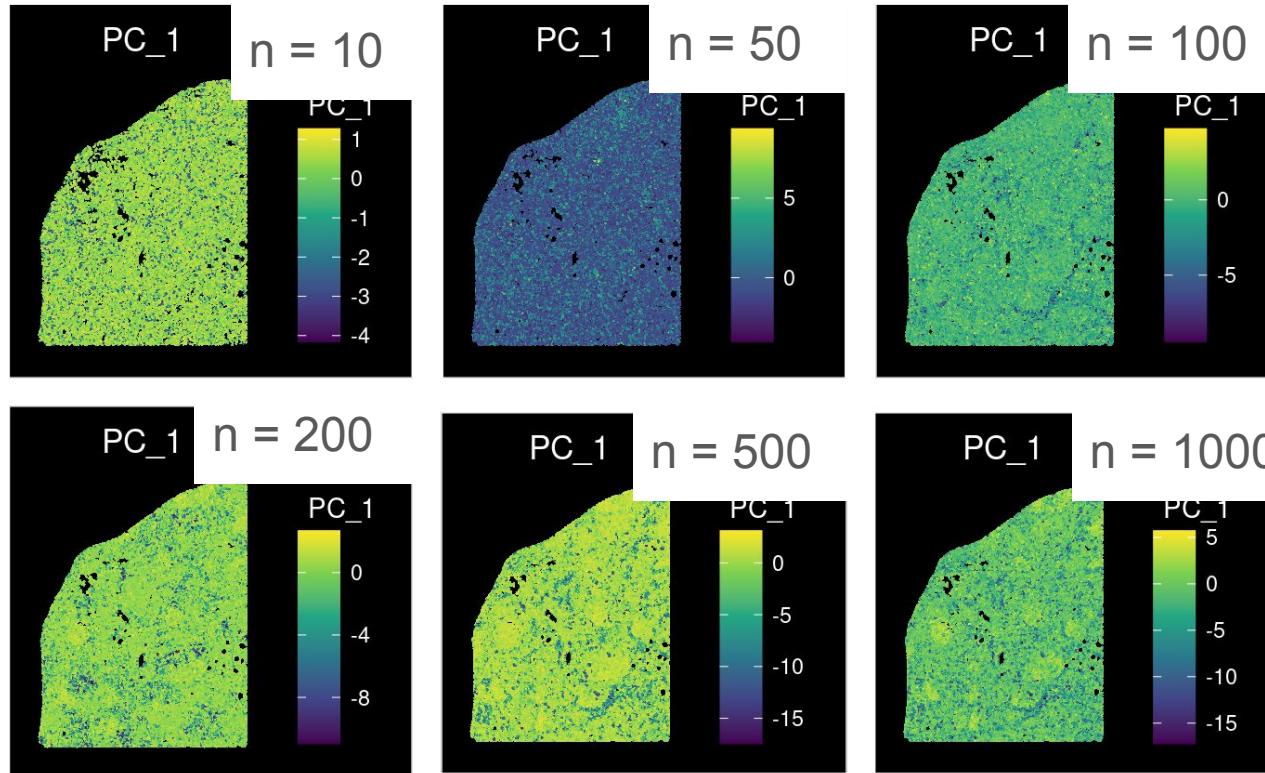
Changing number of genes: 5K vs. ImmunoOnc



Randomly sampling n genes from the 5K panel: PCA

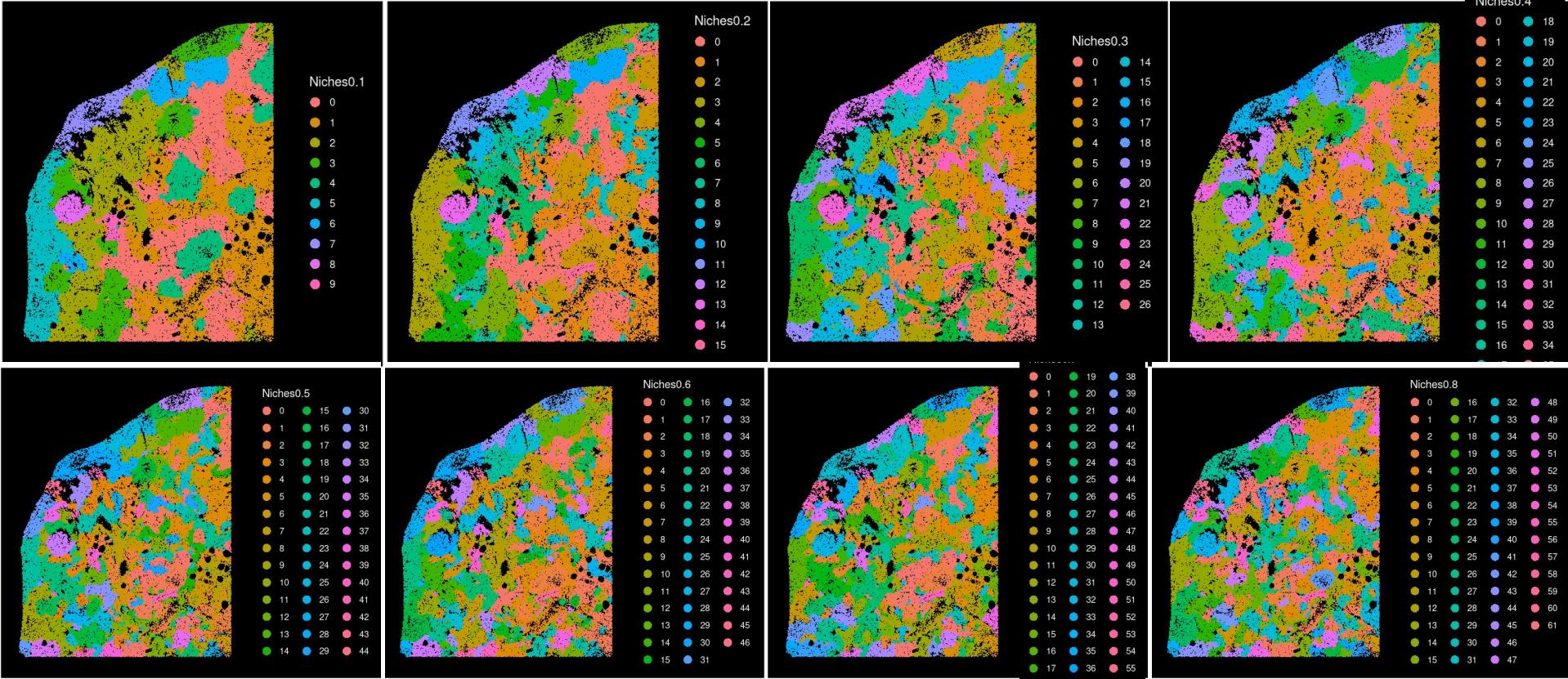


Randomly sampling n genes from the 5K panel: PC1

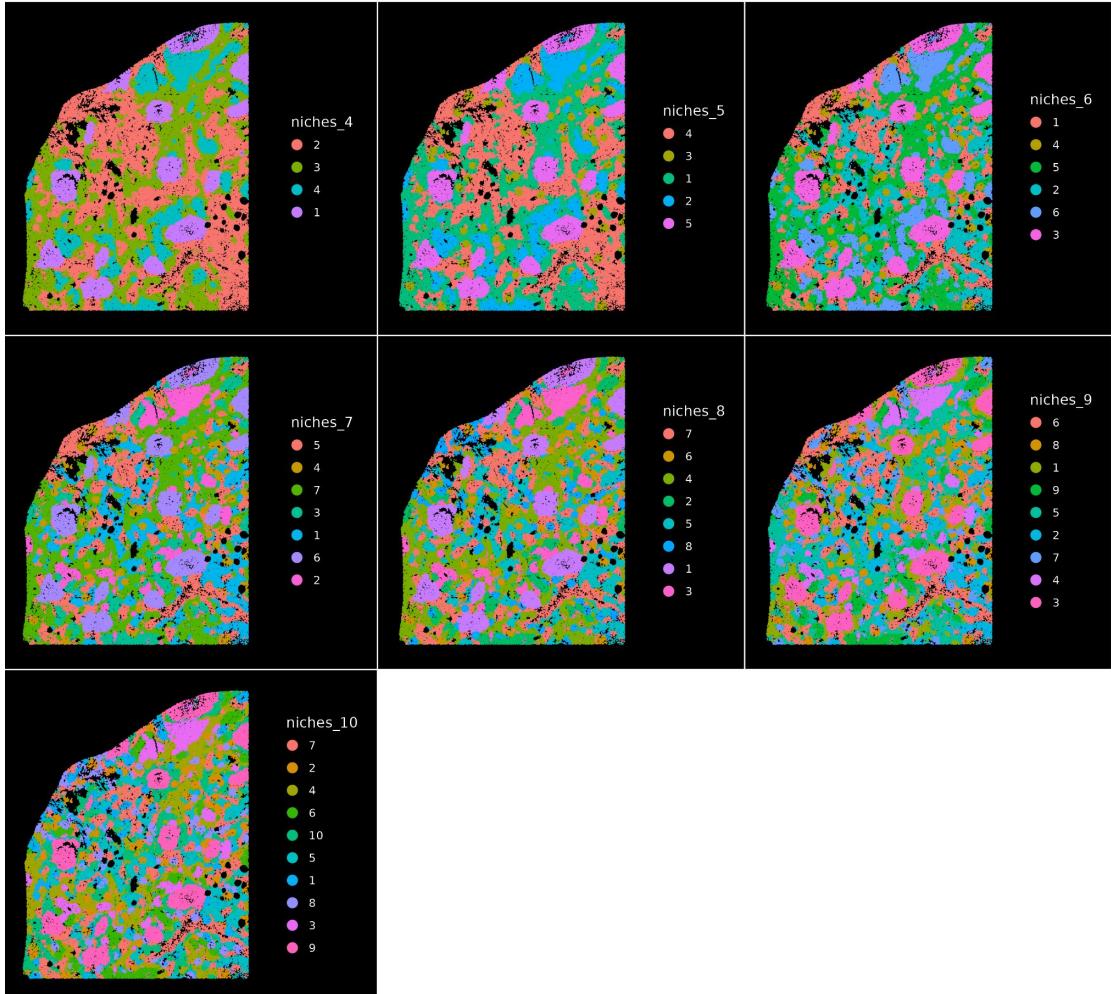


Detecting cellular niches - **unbiased transcriptomics**

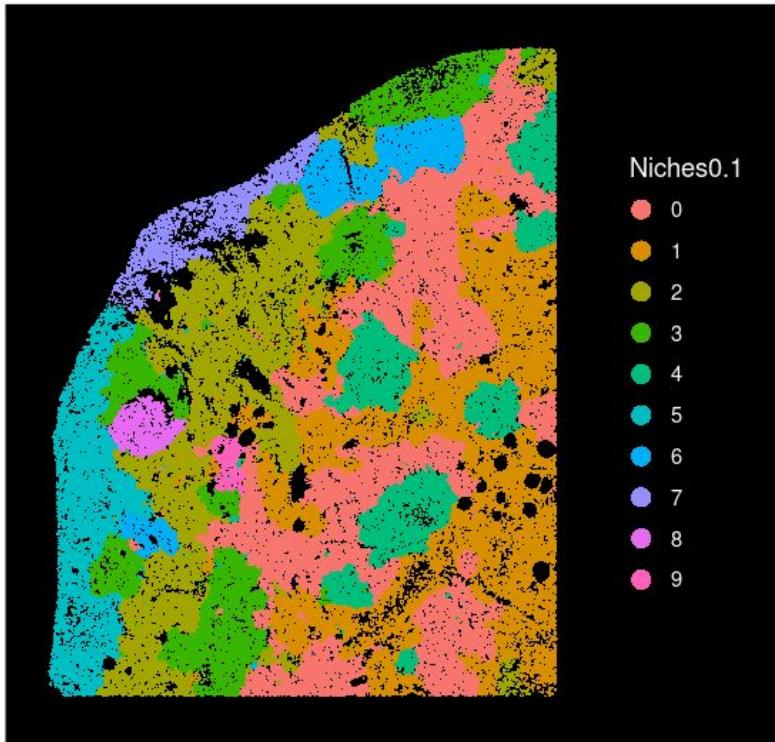
100 neighbours & clustering resolution 0.1 - 0.8



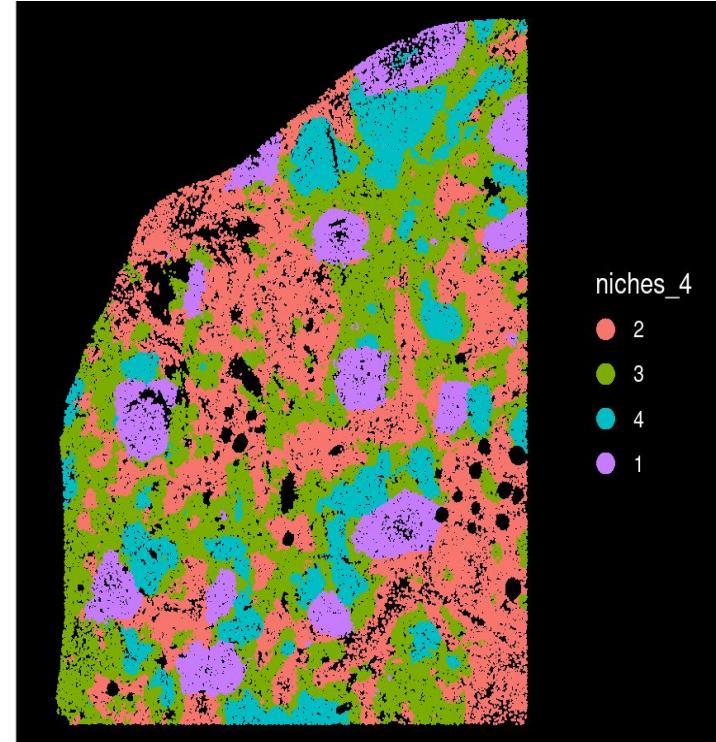
Detecting cellular niches annotation-based detection



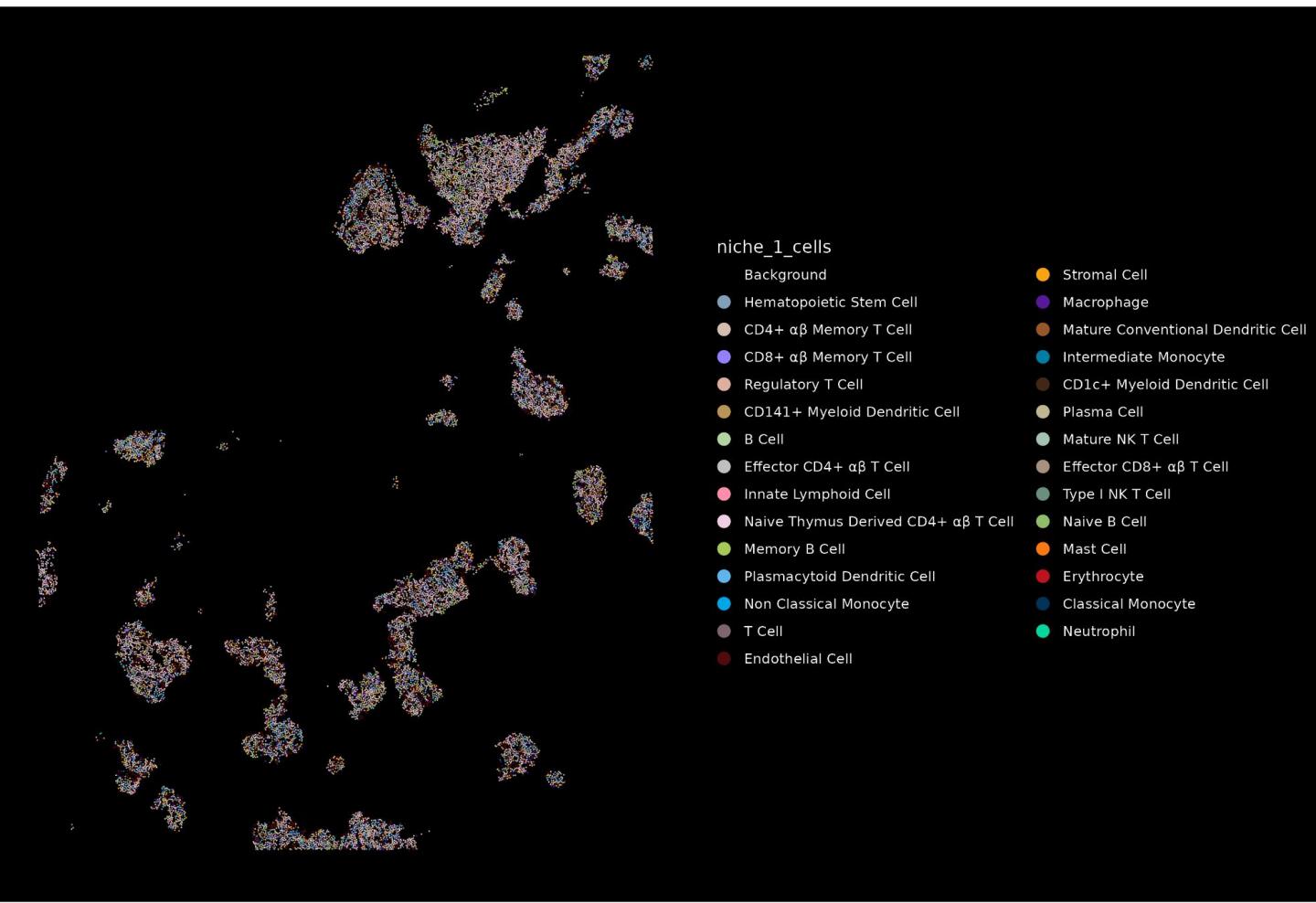
Comparison



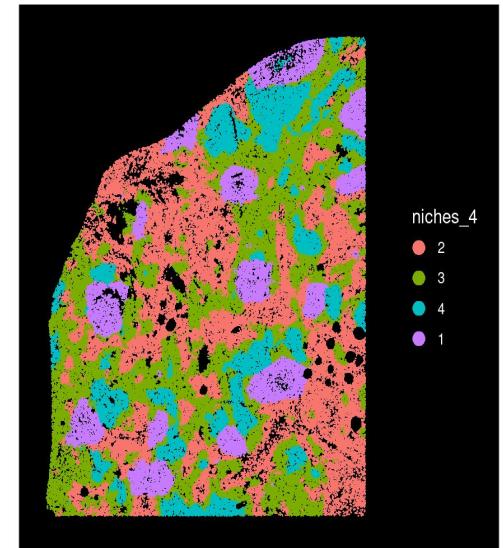
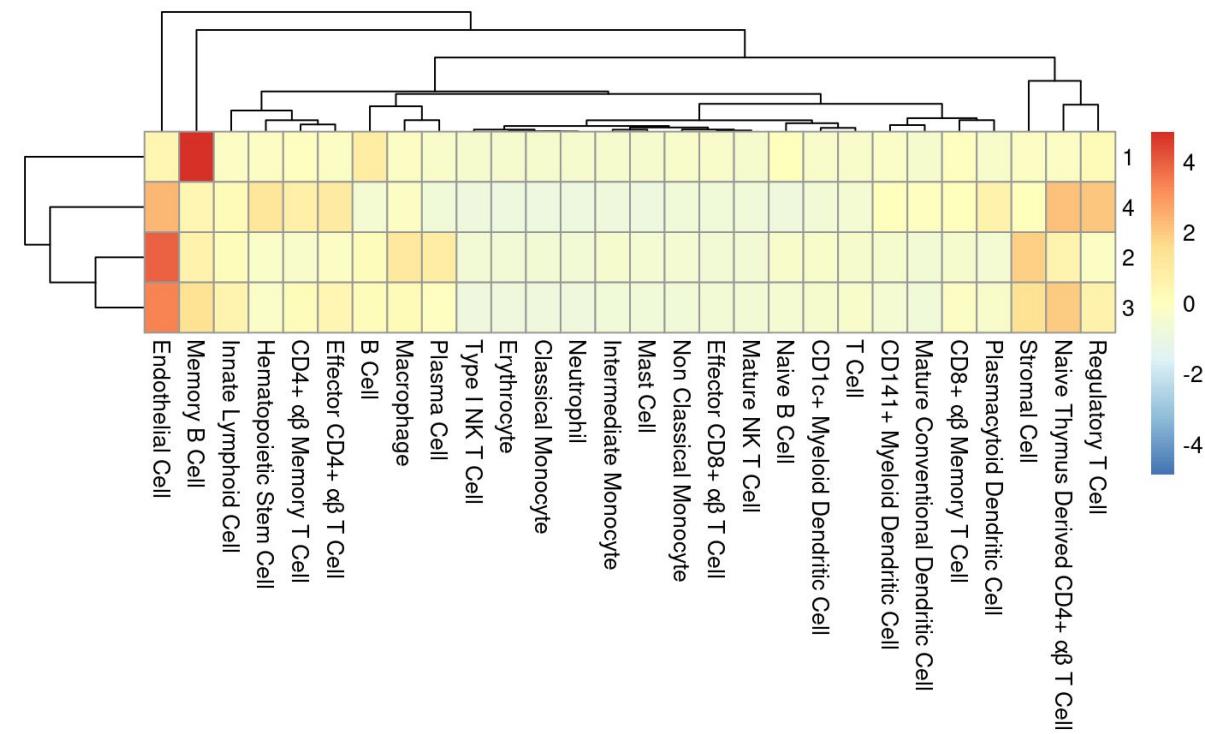
NN-based (from the course)



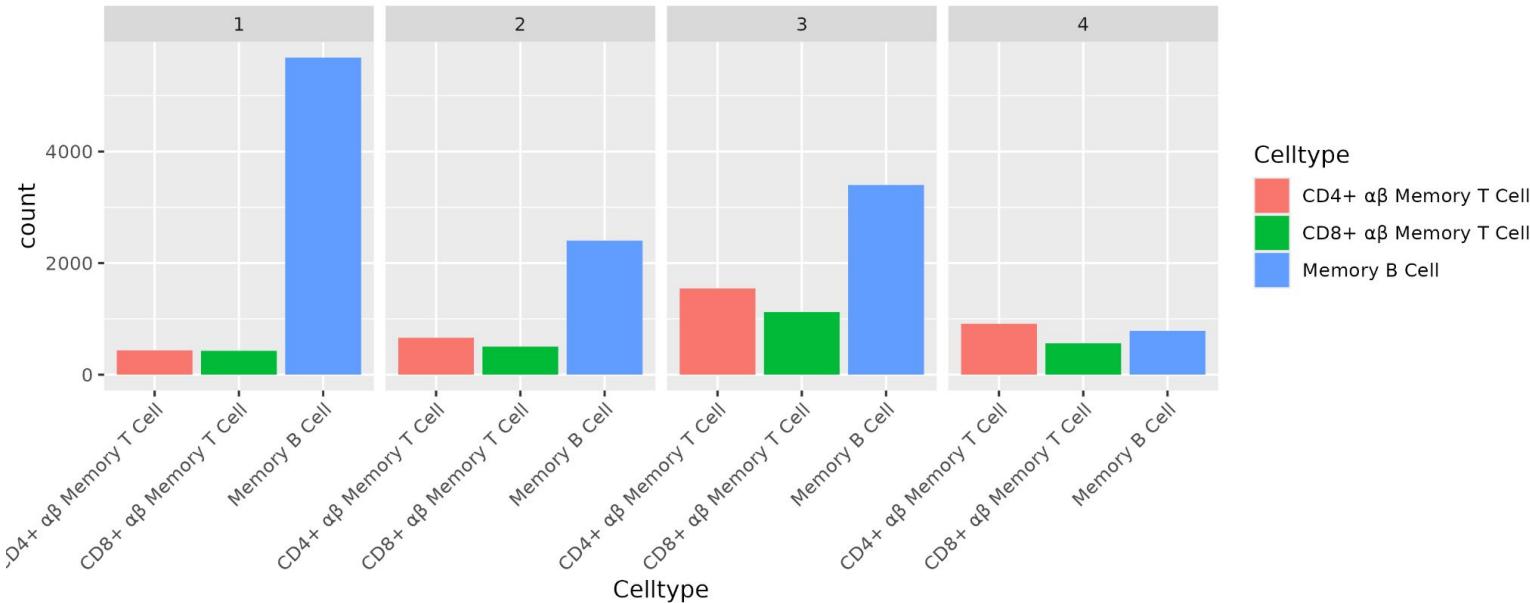
Annotation-based (Seurat native)



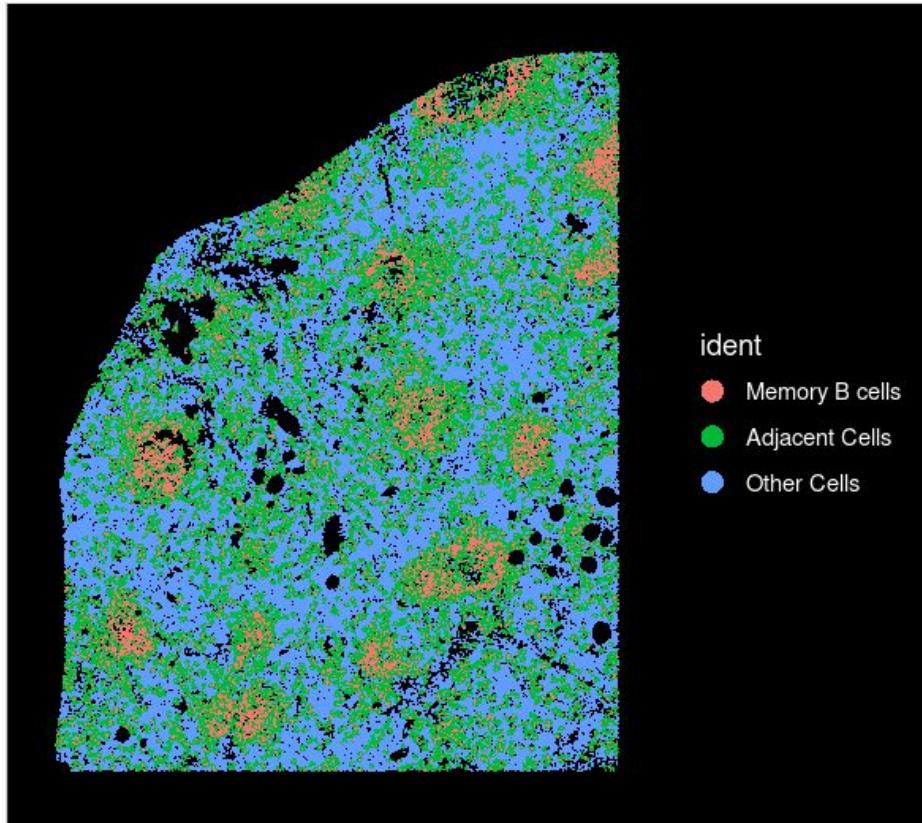
Niche 1 (GC) strongly correlated with mem B cells

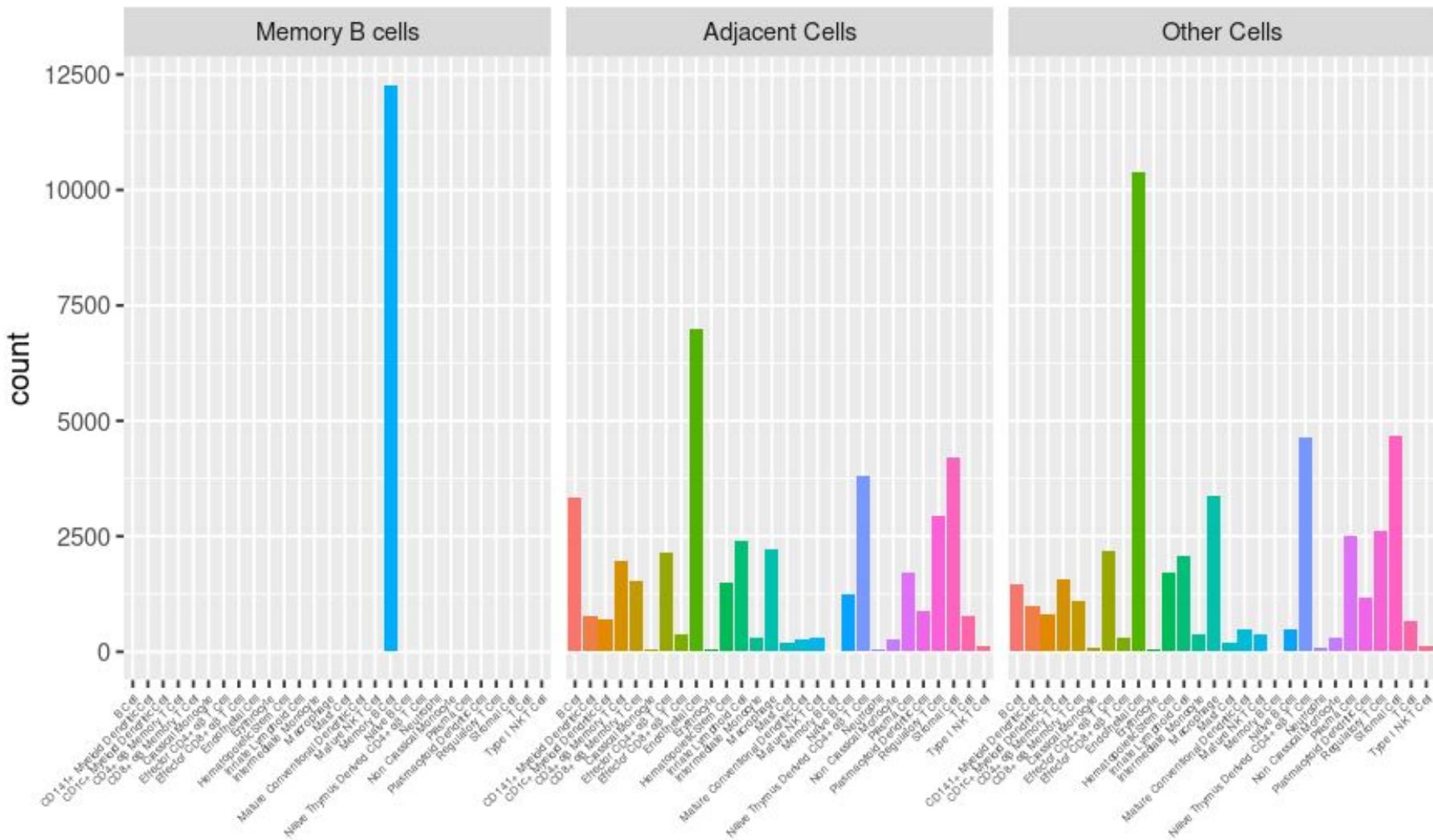


Number of memory lymphocytes in the niche

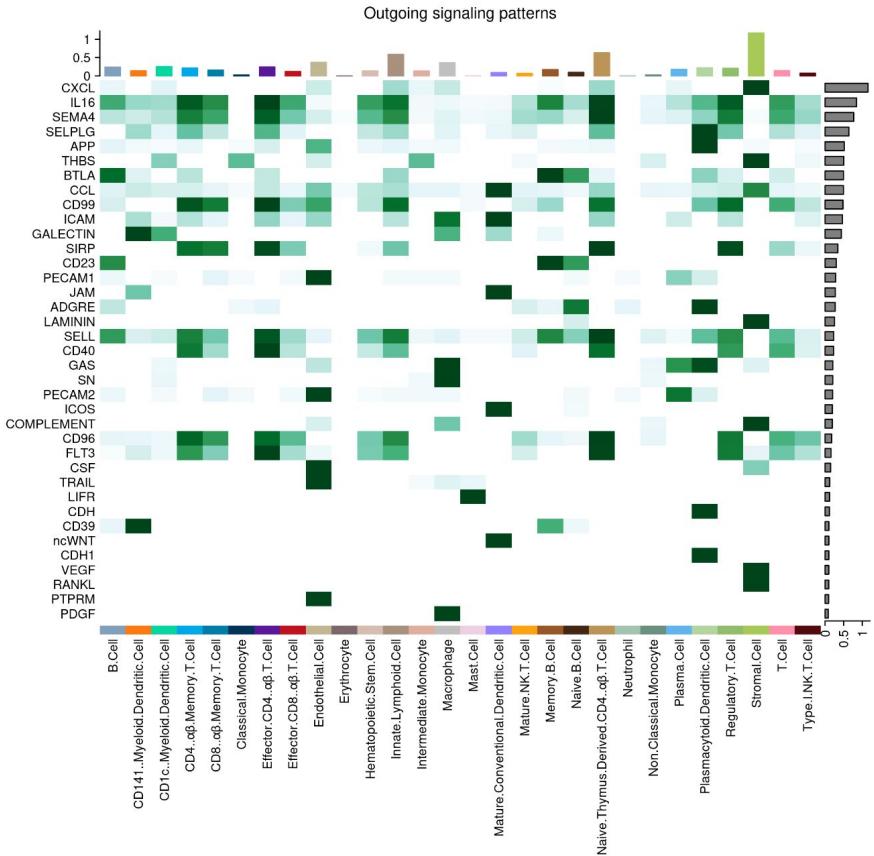
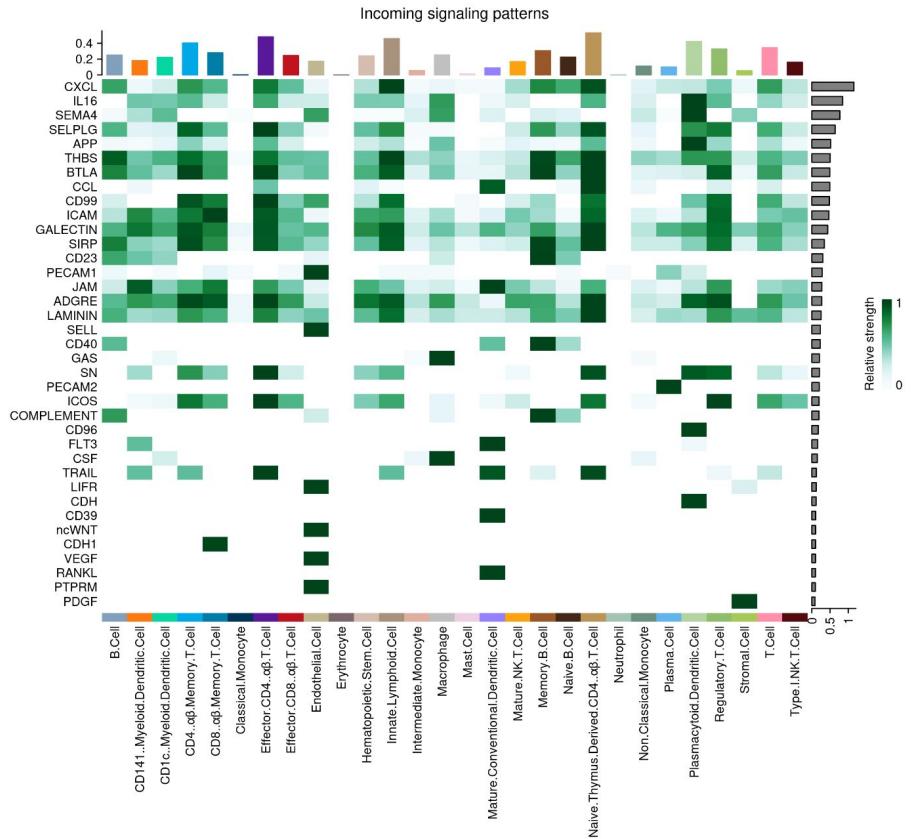


Spatial neighbourhood analysis of germinal centre memory B cells

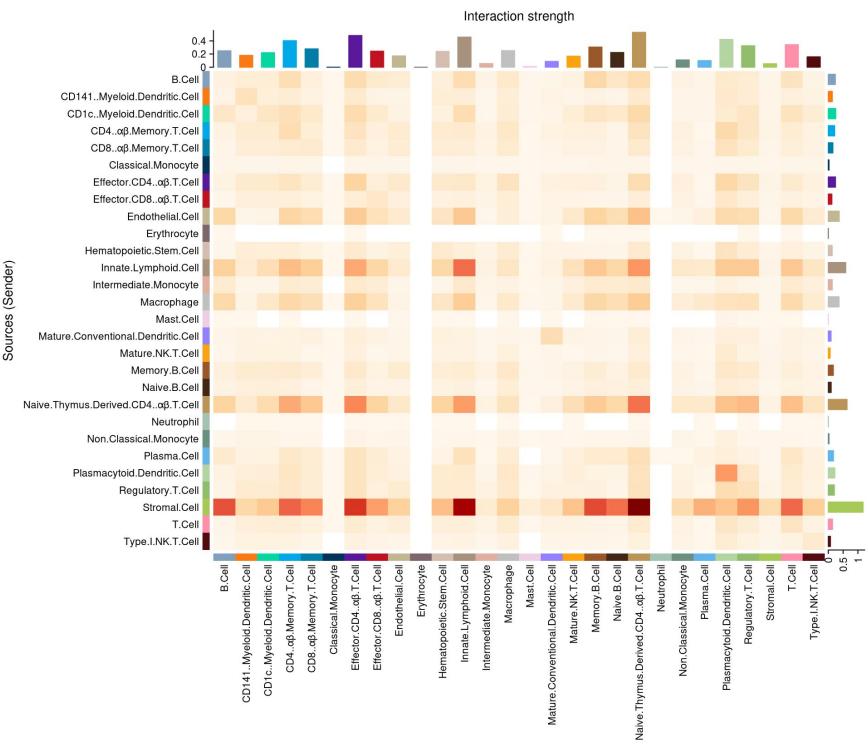
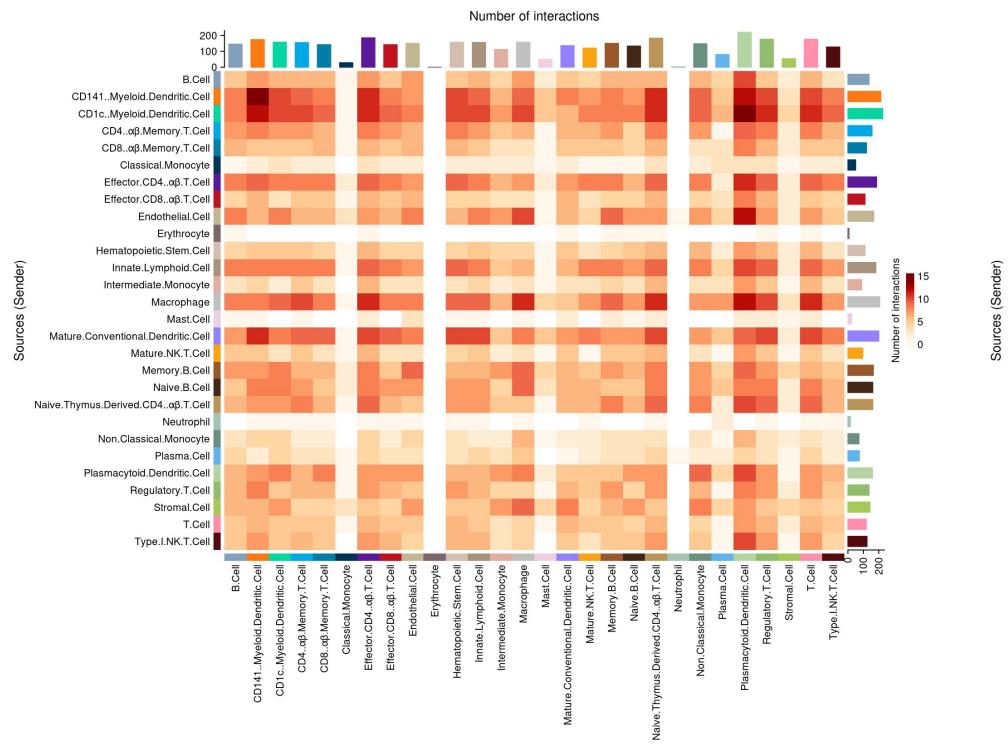




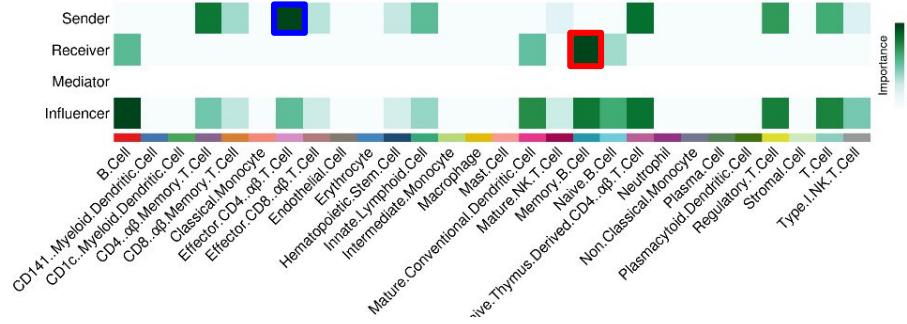
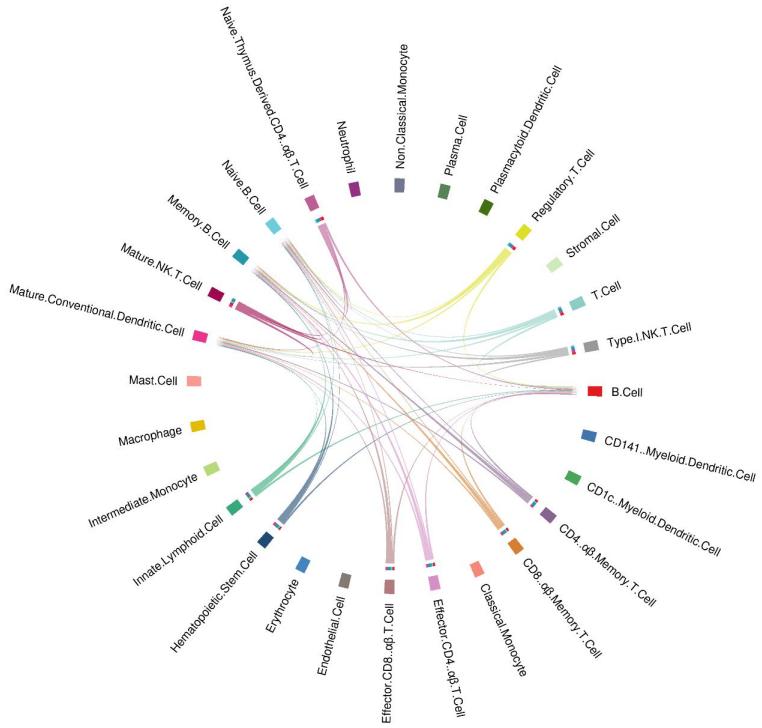
CellChat cell-cell communication analysis



Interaction number and strength



CD40 interactions in the lymph node



CD40 interactions in the lymph node

