

yAP1

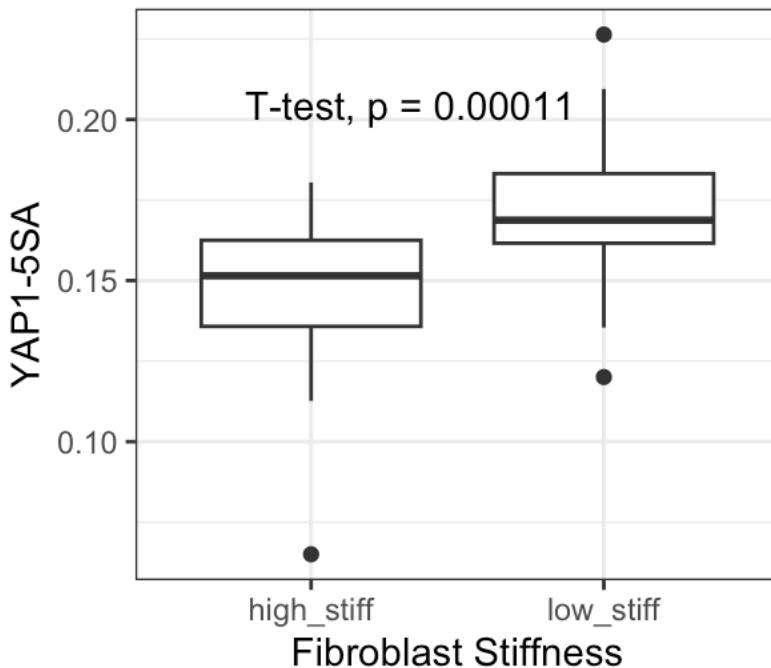


Cancer Heterogeneity by Fibroblast Stiffness

Heterogeneity determined by YAP1 5SA score. Calculated by Gini()

Higher value of Gini Coefficient means the sample is more heterogeneous

Cancer Cell Heterogeneity
Heterogeneity by YAP1-5SA



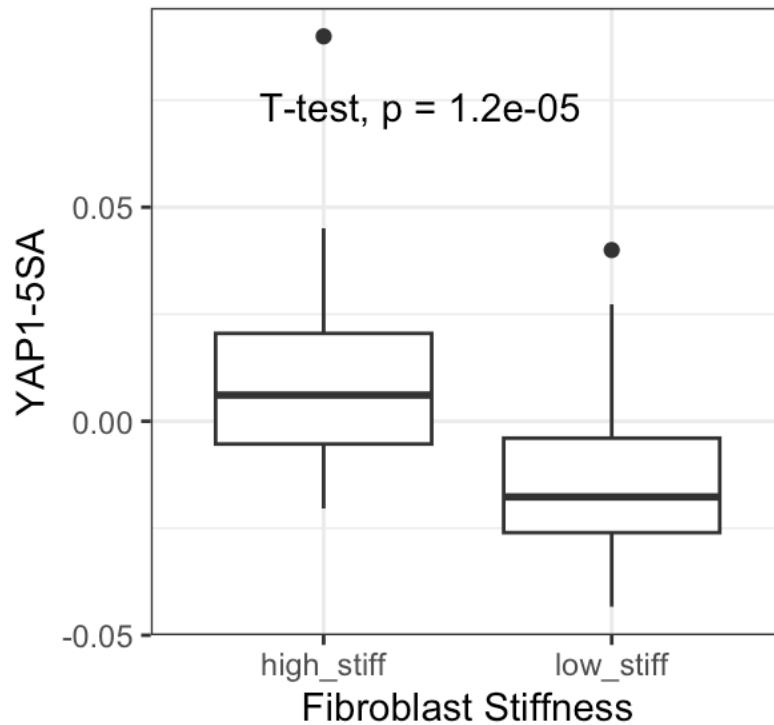
YAP1 5SA Activation Score by Stiffness

YAP1 5SA activation score difference by fibroblast stiffness. Stiffness determined by percentage of fibroblast in sample, > 50% is high stiff and vice versa.

YAP1 5SA score from each cancer cells were aggregated by patient.

Samples with higher stiffness have higher YAP1 5SA score in cancer.

YAP1-5SA Activation Score

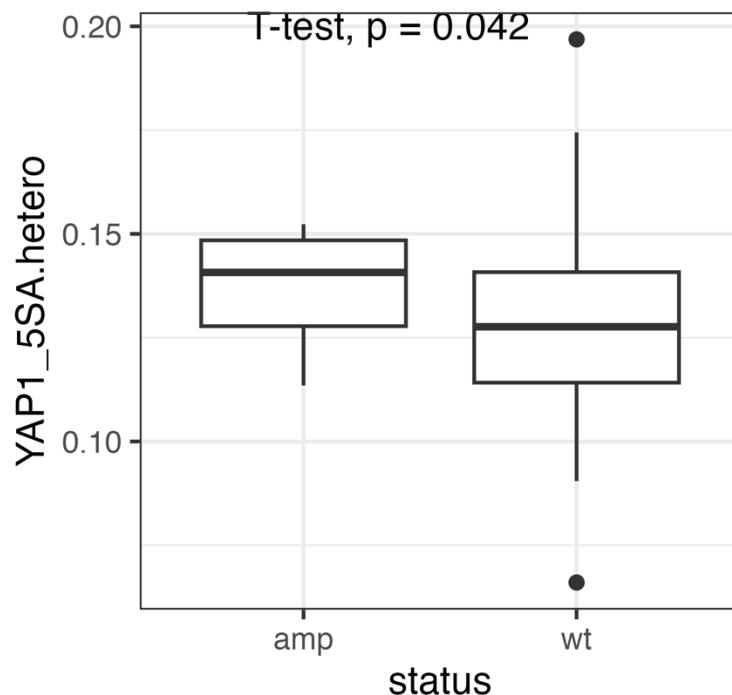


Cancer Heterogeneity by YAP1 Copy Number

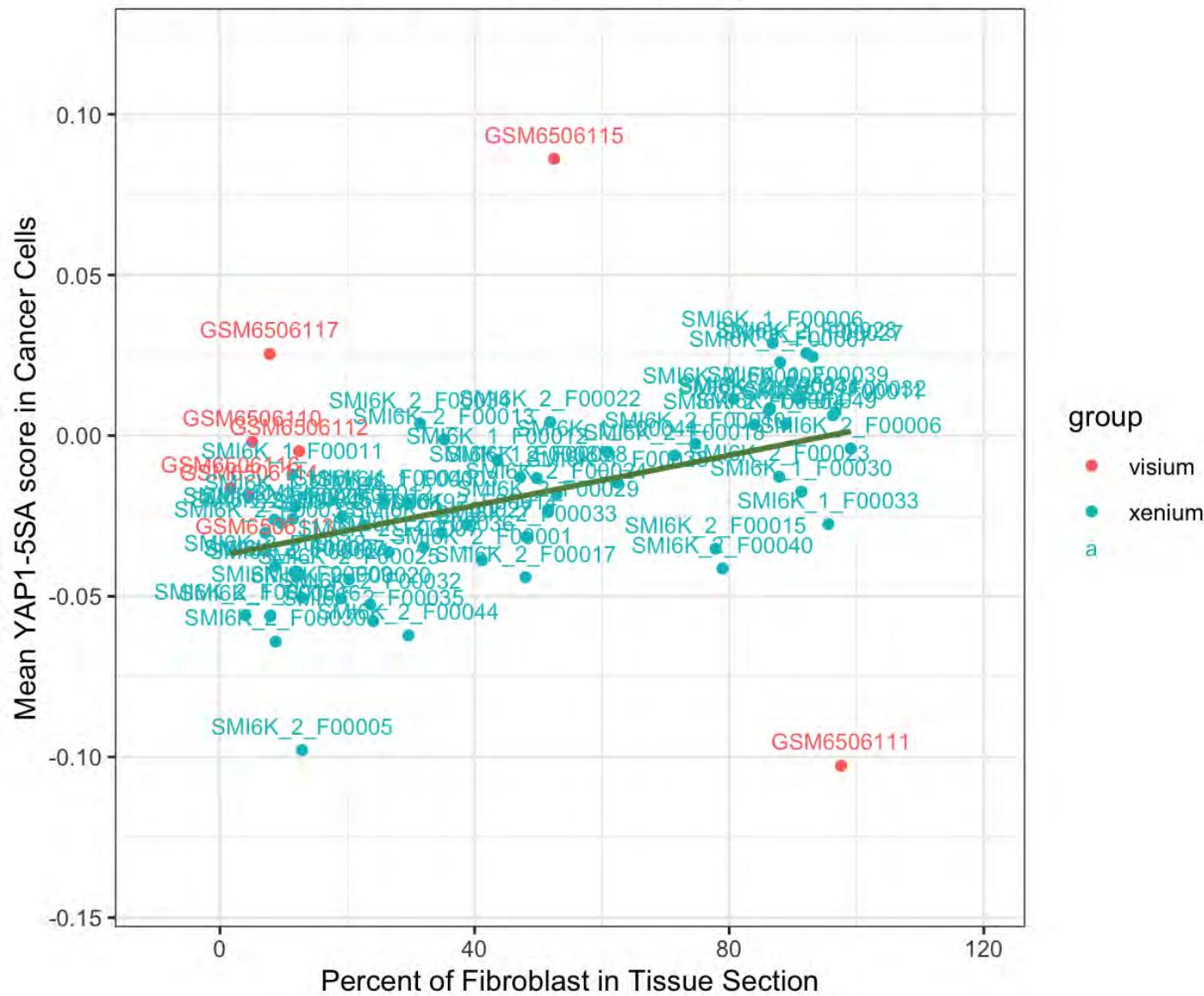
YAP1 5SA based cancer heterogeneity score is higher when YAP1 copy number is higher.

YAP1 copy number is inferred from expression of 11q22 genes extracted from TCGA. Rationale based on gene expression is often correlated with copy number.

Cancer Heterogeneity by YAP
YAP1 Copy Number
inferred from 11q22

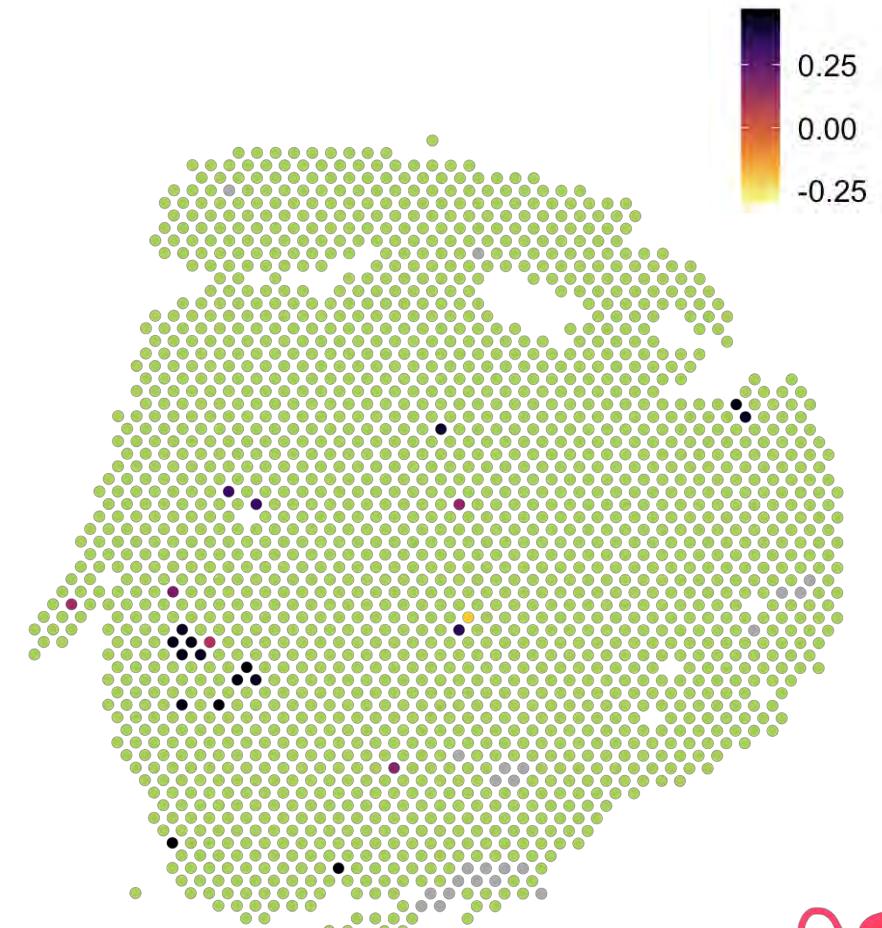
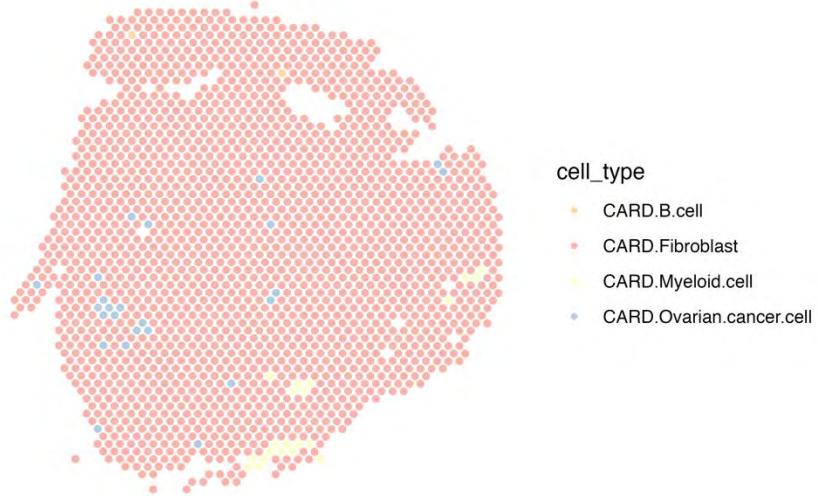


YAP1-5SA score in Cancer Cells Positively Correlates with Increased Fibroblast Percentage in Tissue Section



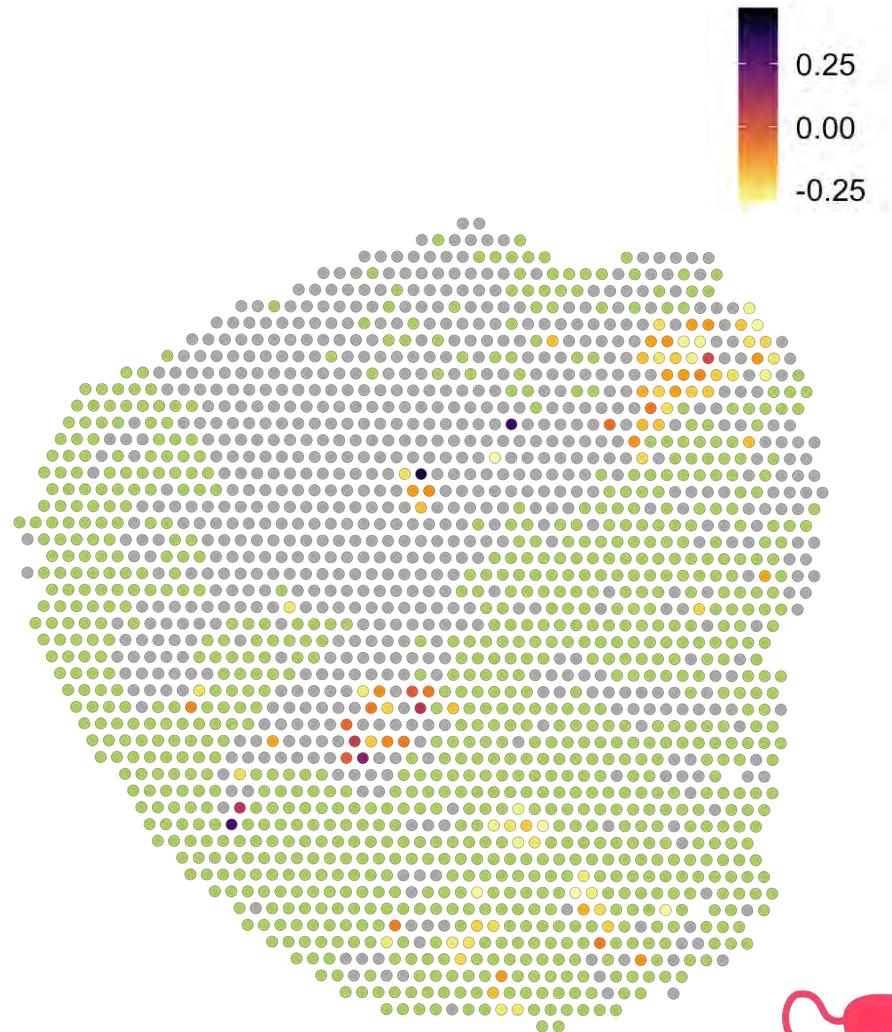
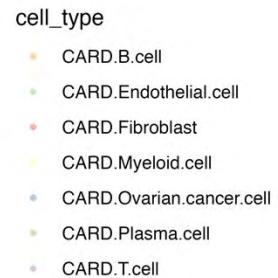
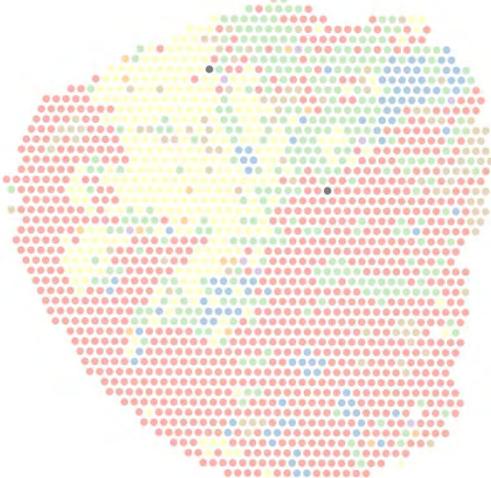
GSM6506111

Percentage of Fibroblast: 97.568546
Mean YAP1-5SA score: -0.102723582



GSM6506115

Percentage of Fibroblast: 52.473596
Mean YAP1-5SA score: 0.086159474

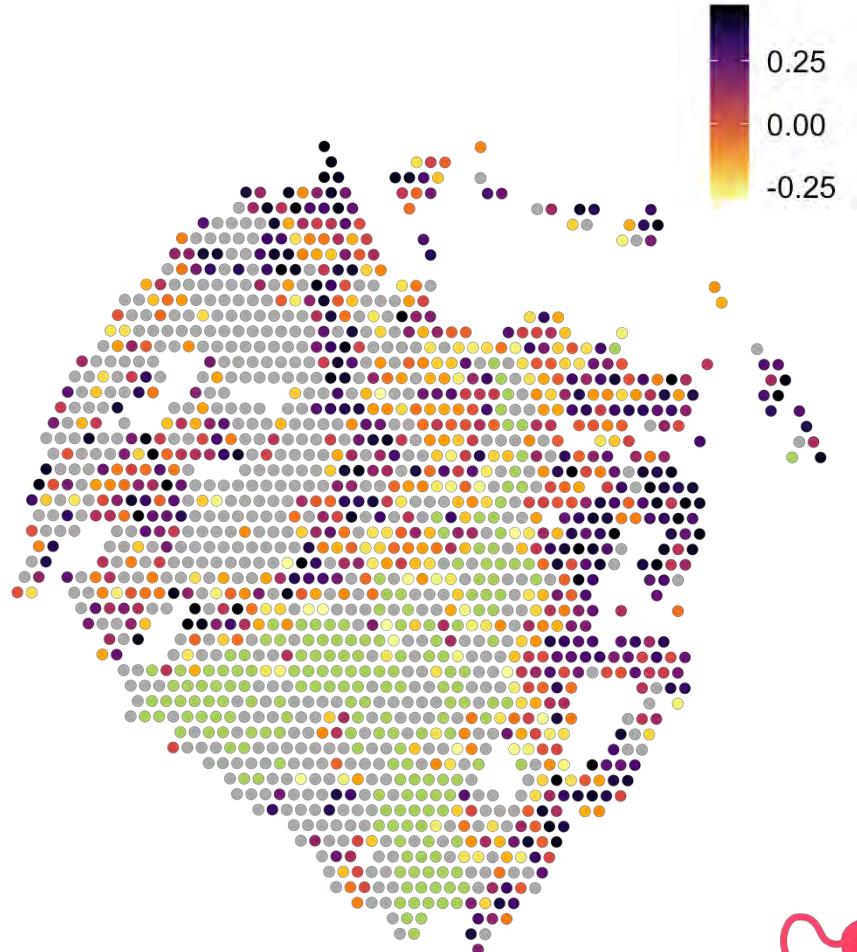


GSM6506112

Percentage of Fibroblast: 12.441783
Mean YAP1-5SA score: -0.004848641

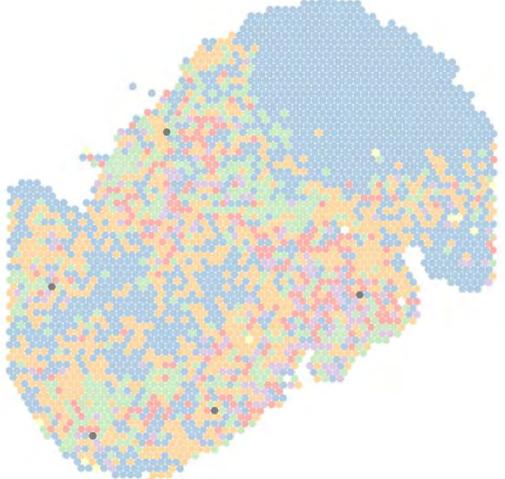


- cell_type
- CARD.B.cell
 - CARD.Endothelial.cell
 - CARD.Fibroblast
 - CARD.Myeloid.cell
 - CARD.Ovarian.cancer.cell
 - CARD.Plasma.cell
 - CARD.T.cell

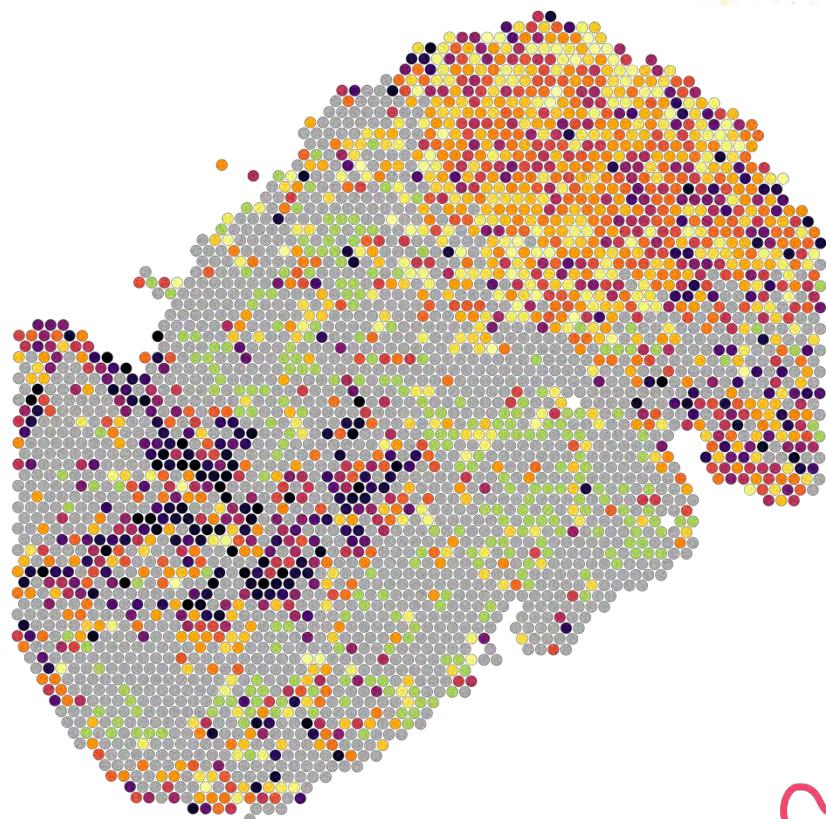


GSM6506117

Percentage of Fibroblast: 7.803650
Mean YAP1-5SA score: 0.025410016

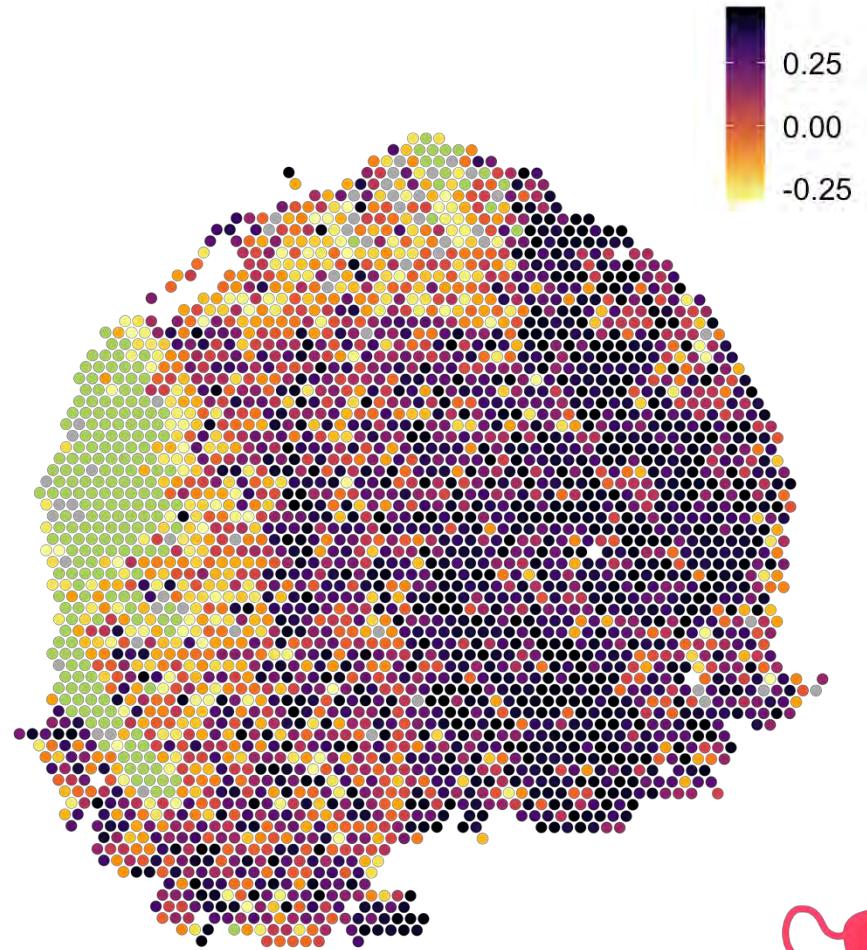
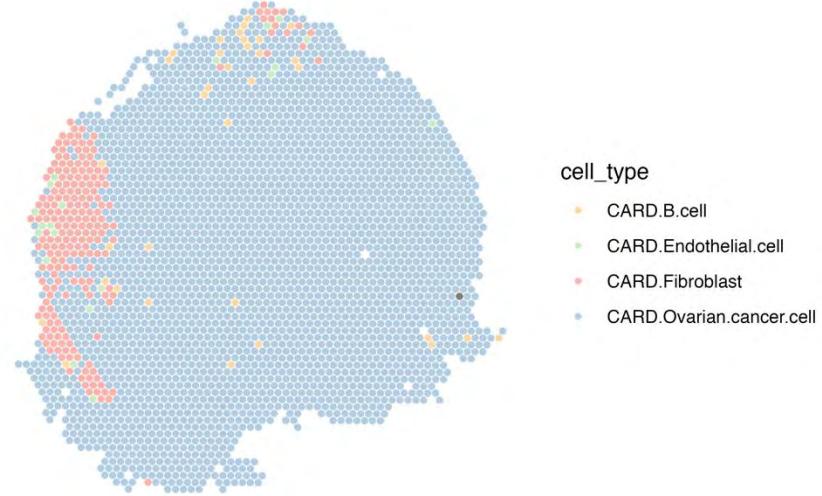


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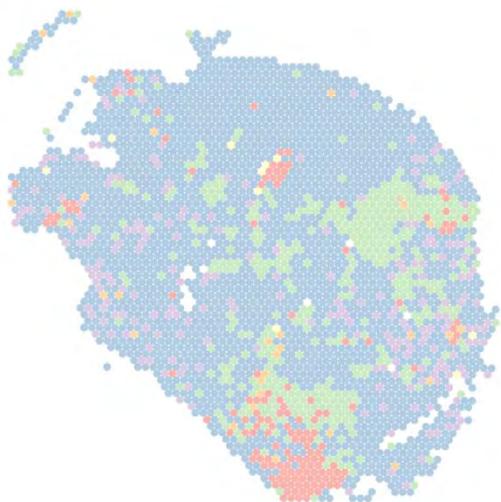
GSM6506113

Percentage of Fibroblast: 7.059607
Mean YAP1-5SA score: -0.035629332

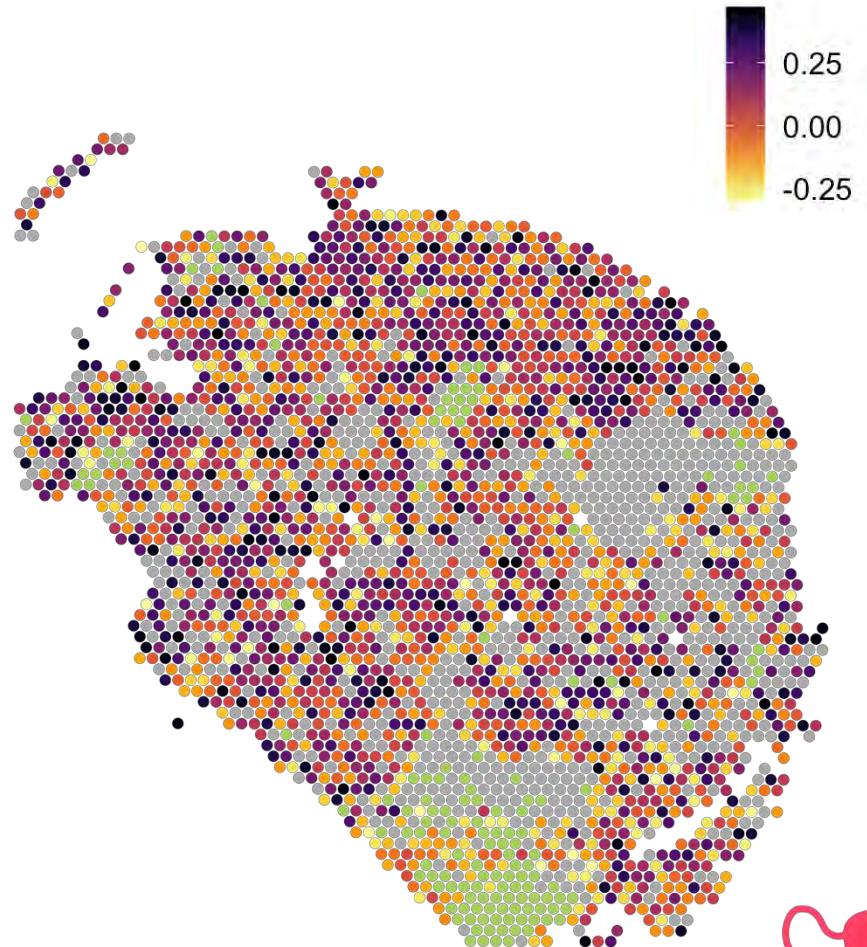


GSM6506110

Percentage of Fibroblast: 5.074932
Mean YAP1-5SA score: -0.001949589

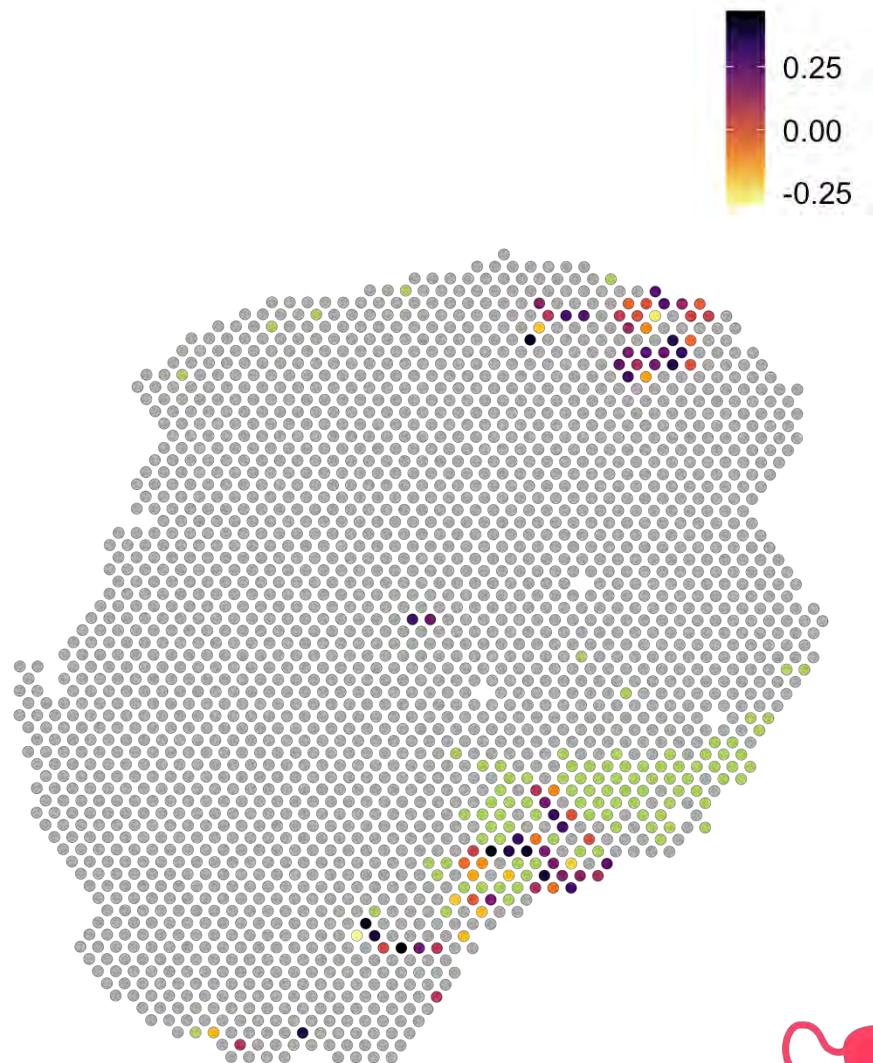
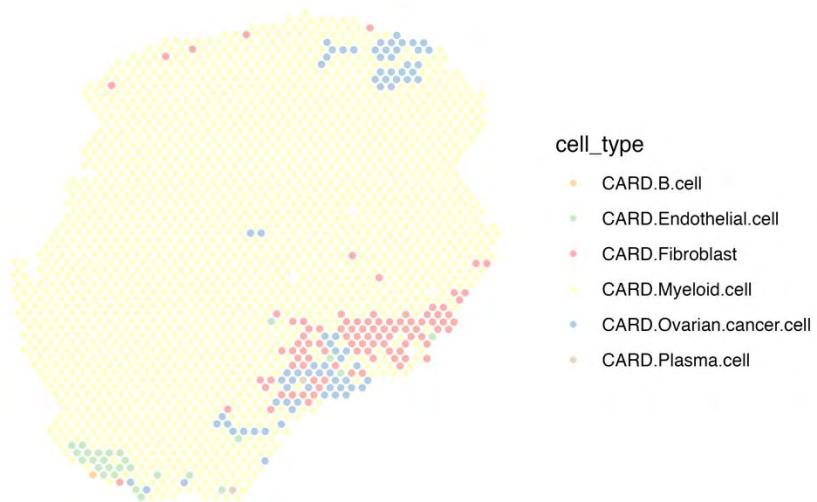


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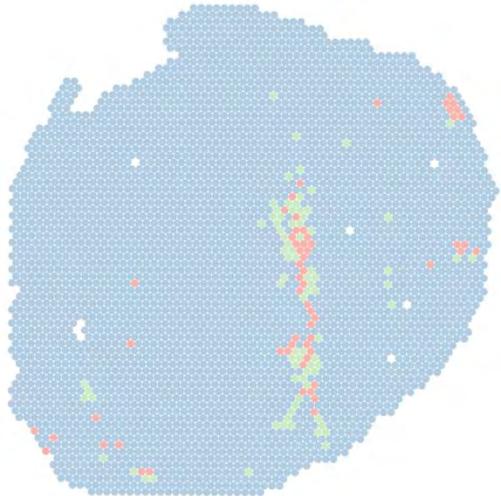
GSM6506114

Percentage of Fibroblast: 4.575472
Mean YAP1-5SA score: -0.019027257



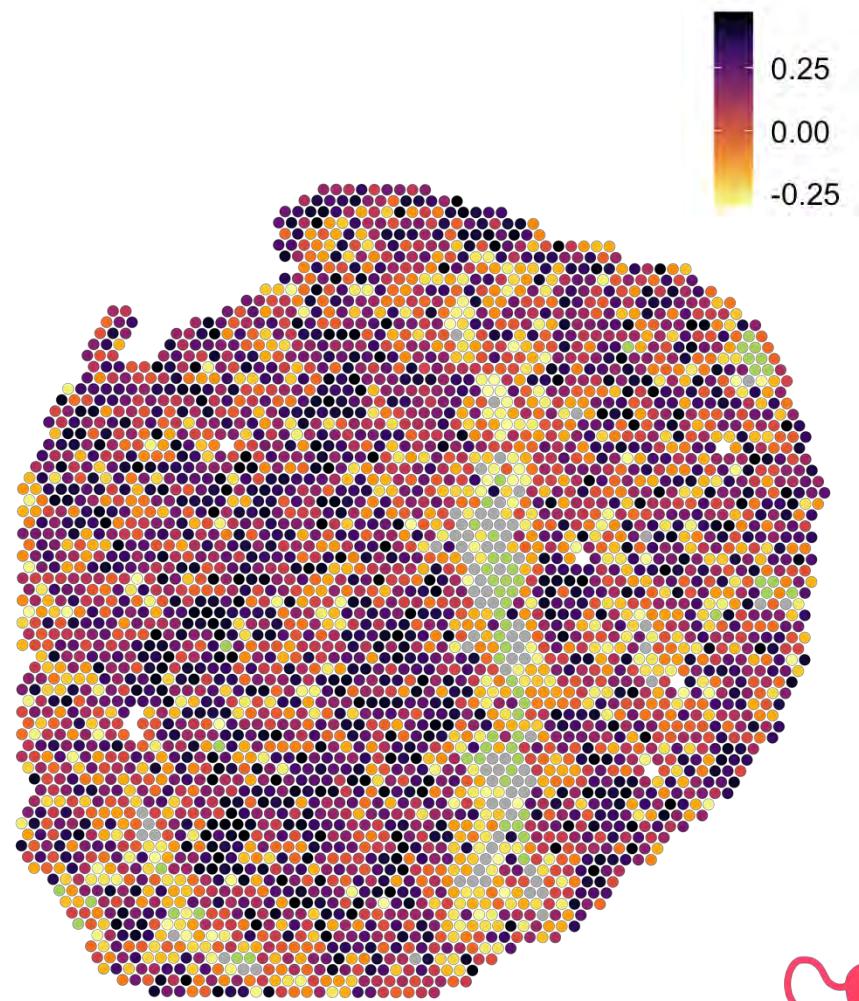
GSM6506116

Percentage of Fibroblast: 1.655629
Mean YAP1-5SA score: -0.016324754



cell_type

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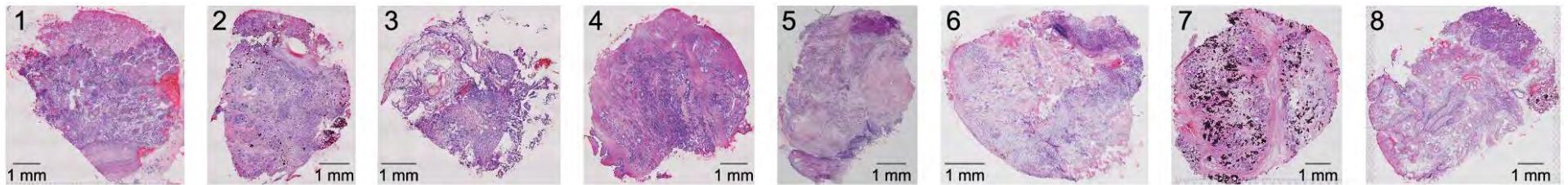


Appendix 1: Infer Cell Type by CARD

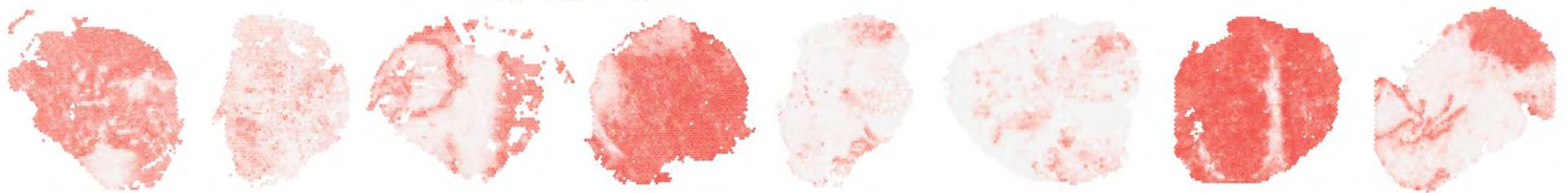
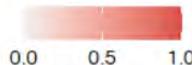


Cancer Cells

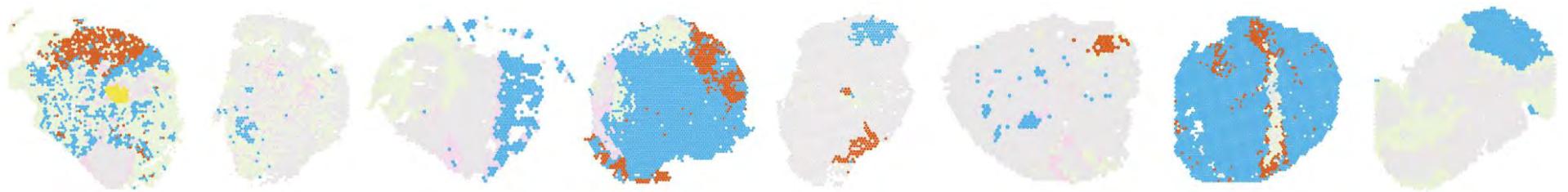
H&E Staining



Tumor-RCTD weights



Copy Number Based Clusters



Blue, red, and yellow = putative tumour subclones

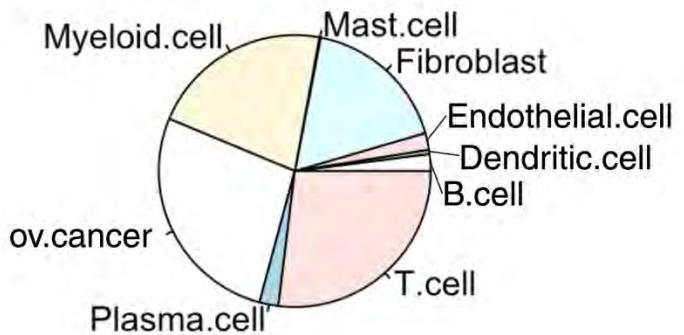
Grey = non-malignant regions with RCTD tumour scores <0.15

Green and pink = border regions

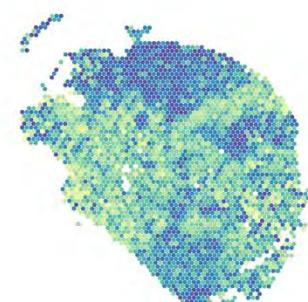
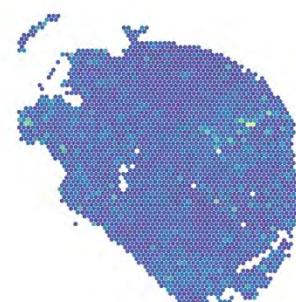
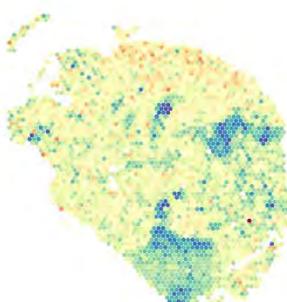
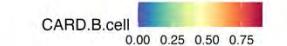
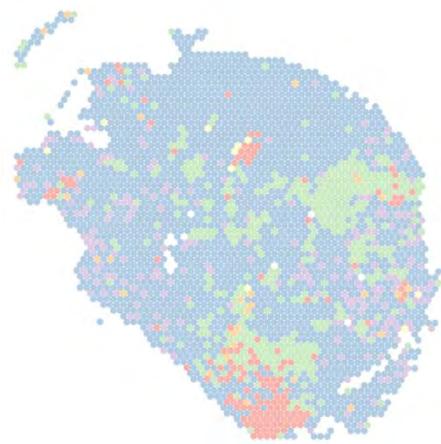


Method

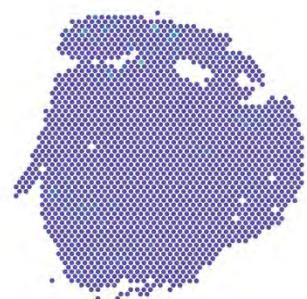
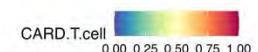
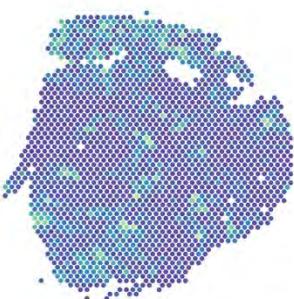
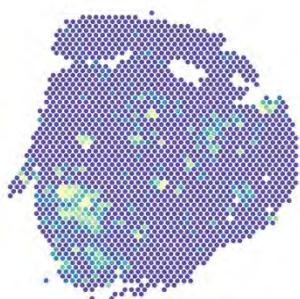
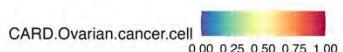
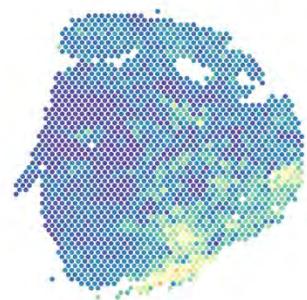
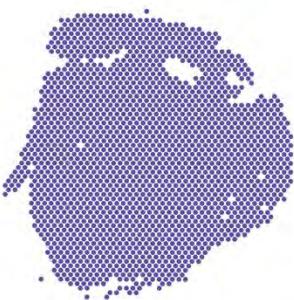
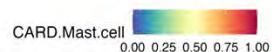
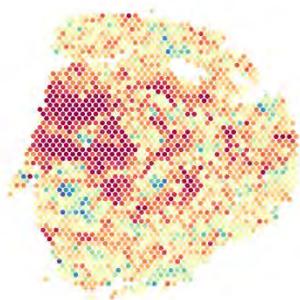
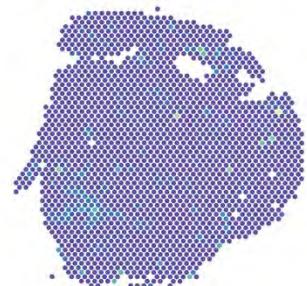
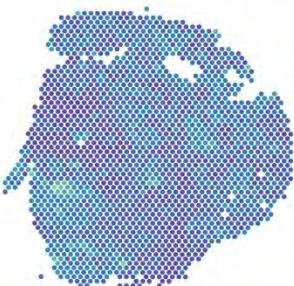
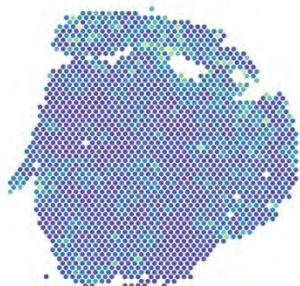
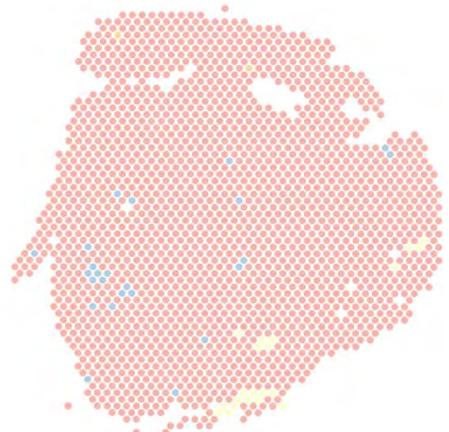
- Reference Dataset: stratified sub-setting of 40% of cells in GSE180661 dataset — in total 371,870 cells were used as reference for CARD algorithm.
 - Pie Chart on Right -- Proportion of each cell type in the reference dataset
- We supplied the following items to CARD
 - Single-cell count matrix
 - Single-cell metadata (cell id, cell type, sample id)
 - Spatial transcriptomics count matrix
 - Spatial transcriptomics coordinates (row, col)
- Two core functions:
 - `createCARDObject`
 - `CARD_deconvolution`
- Output:
 - `CARD@Proportion_CARD` -- A table of likelihood (out of 1) of each cell being in particular cell type



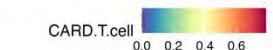
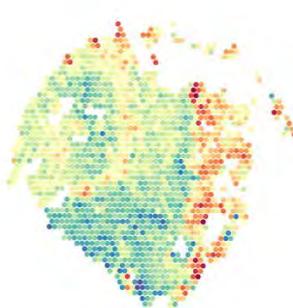
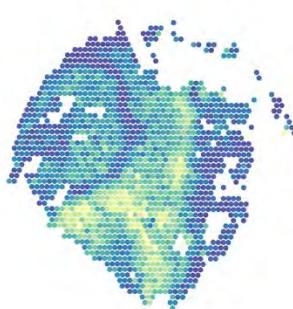
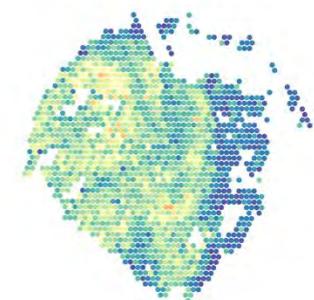
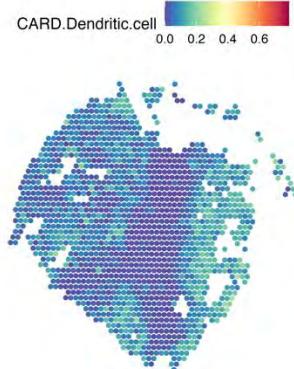
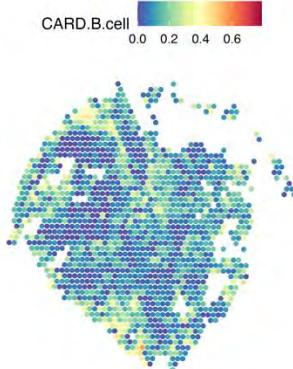
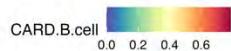
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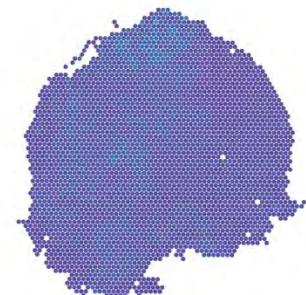
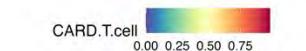
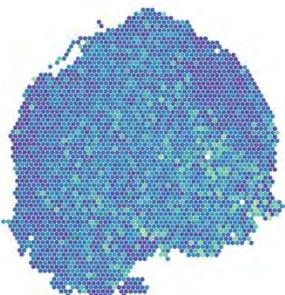
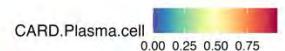
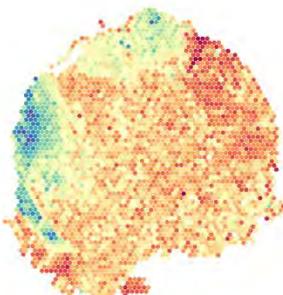
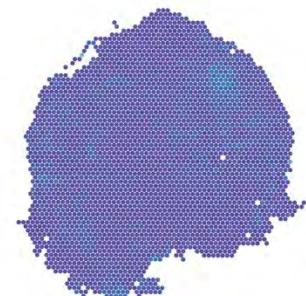
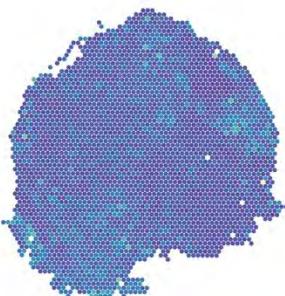
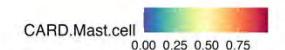
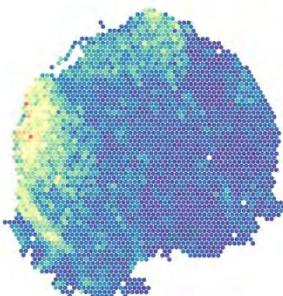
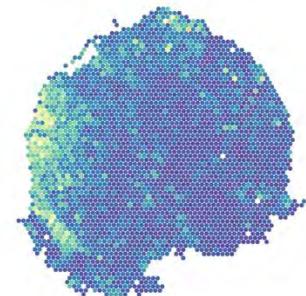
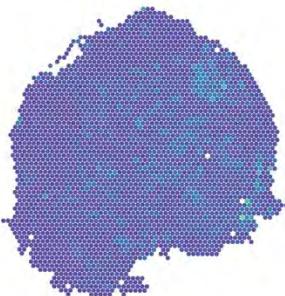
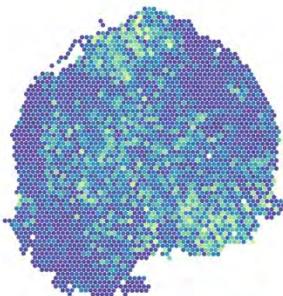
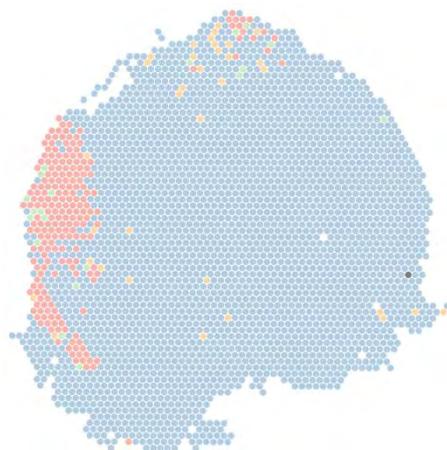
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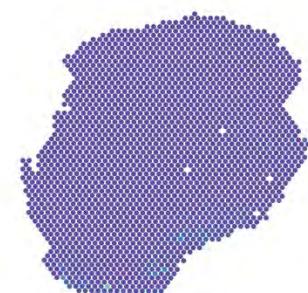
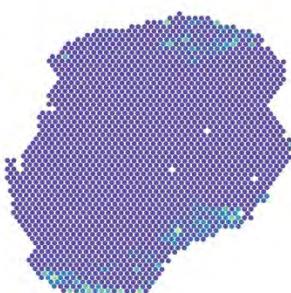
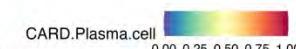
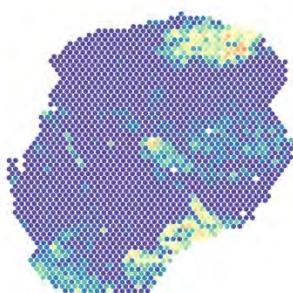
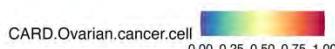
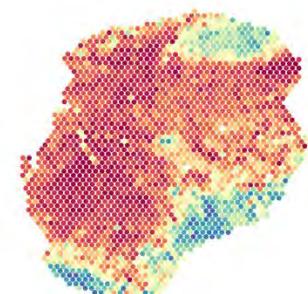
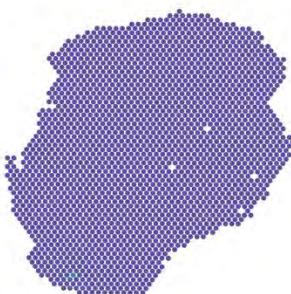
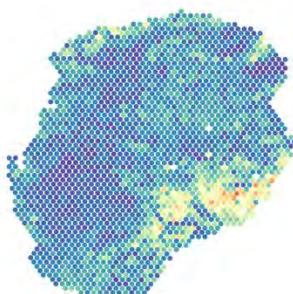
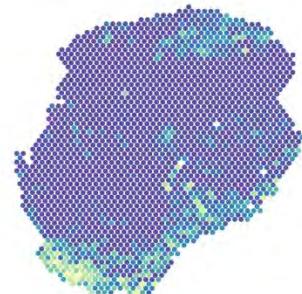
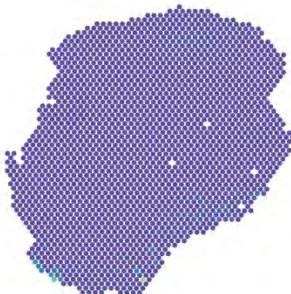
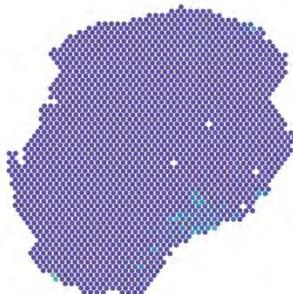
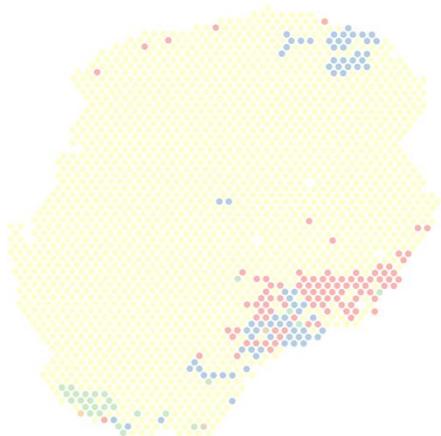
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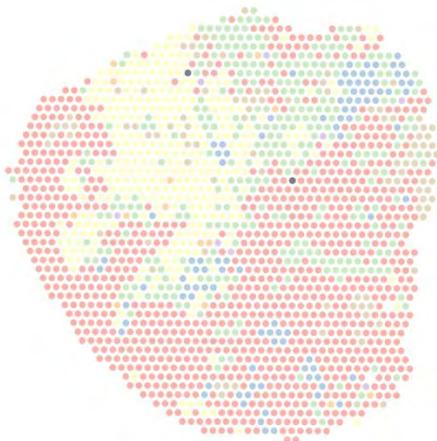
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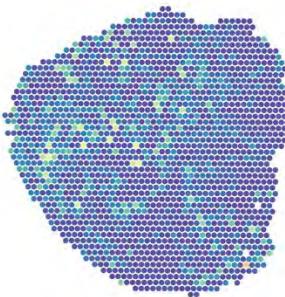
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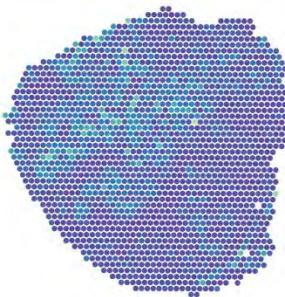
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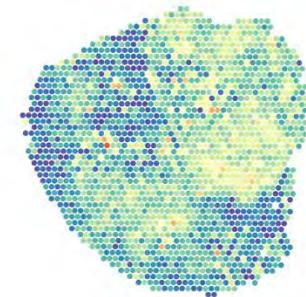
CARD.B.cell
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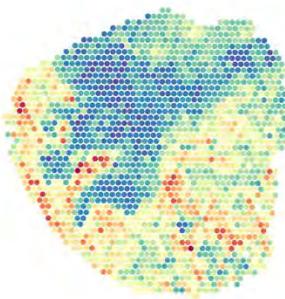
CARD.Dendritic.cell
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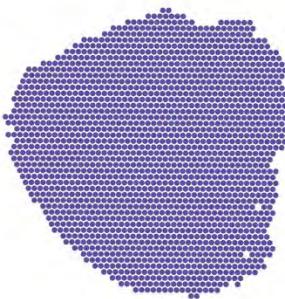
CARD.Endothelial.cell
0.00 0.25 0.50 0.75



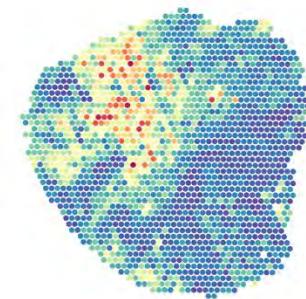
CARD.Fibroblast
0.00 0.25 0.50 0.75



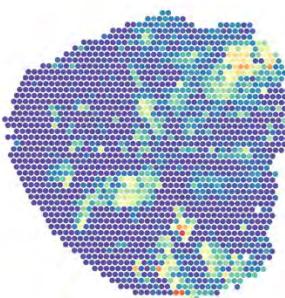
CARD.Mast.cell
0.00 0.25 0.50 0.75



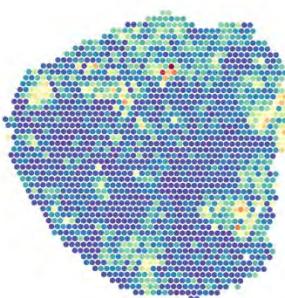
CARD.Myeloid.cell
0.00 0.25 0.50 0.75



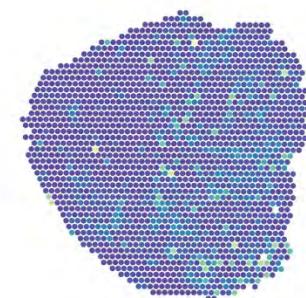
CARD.Ovarian.cancer.cell
0.00 0.25 0.50 0.75



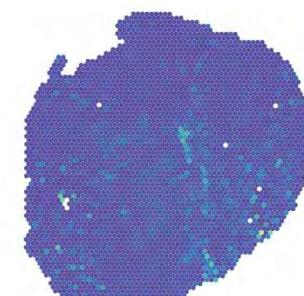
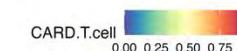
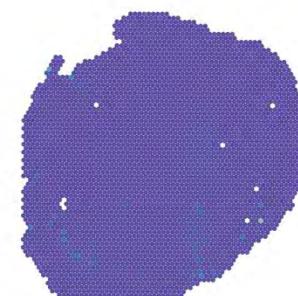
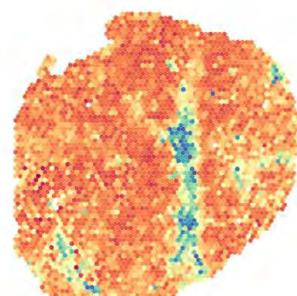
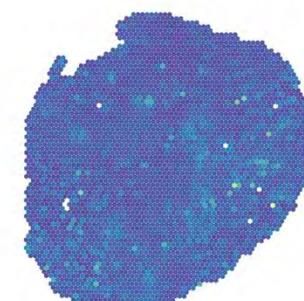
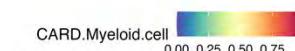
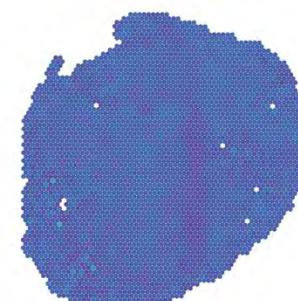
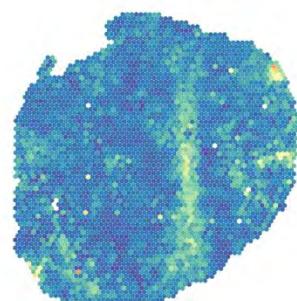
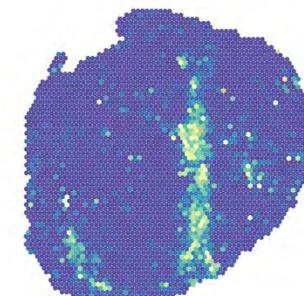
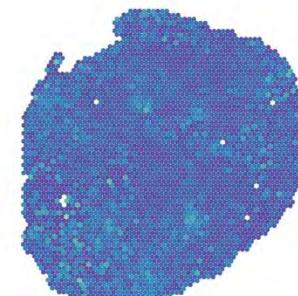
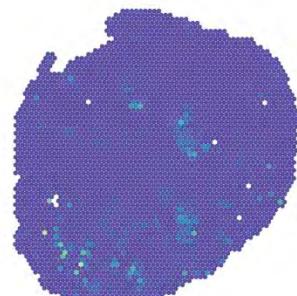
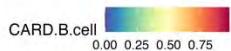
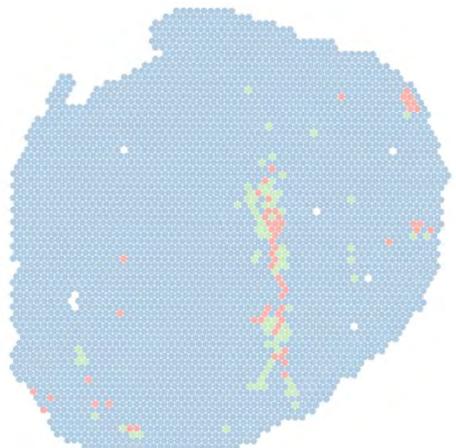
CARD.Plasma.cell
0.00 0.25 0.50 0.75



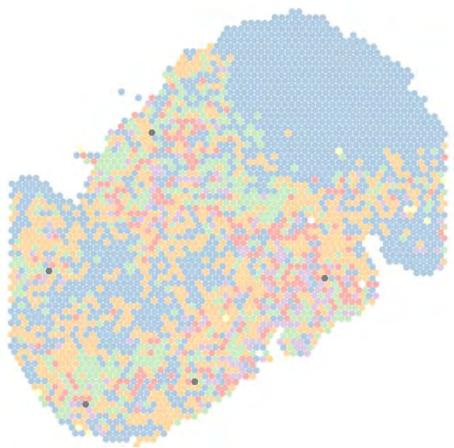
CARD.T.cell
0.00 0.25 0.50 0.75



GSM6506116



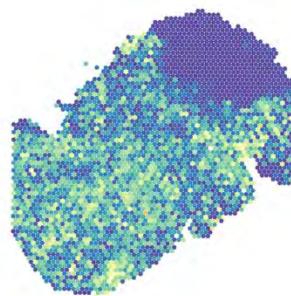
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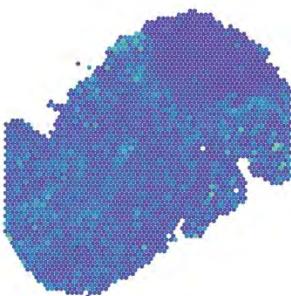
cell_type

- CARD.B.cell
- CARD.Endothelial.cell
- CARD.Fibroblast
- CARD.Myeloid.cell
- CARD.Ovarian.cancer.cell
- CARD.Plasma.cell
- CARD.T.cell

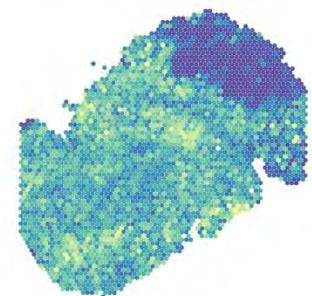
CARD.B.cell
0.00 0.25 0.50 0.75 1.00



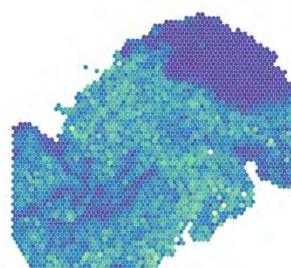
CARD.Dendritic.cell
0.00 0.25 0.50 0.75 1.00



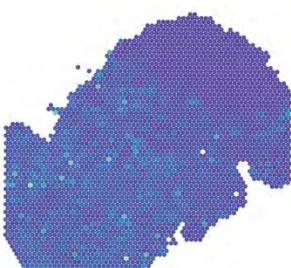
CARD.Endothelial.cell
0.00 0.25 0.50 0.75 1.00



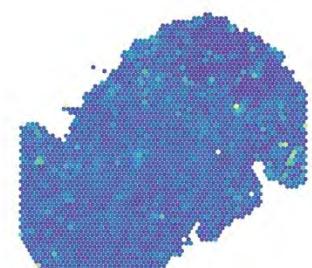
CARD.Fibroblast
0.00 0.25 0.50 0.75 1.00



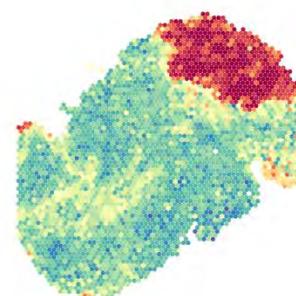
CARD.Mast.cell
0.00 0.25 0.50 0.75 1.00



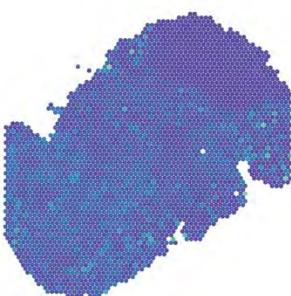
CARD.Myeloid.cell
0.00 0.25 0.50 0.75 1.00



CARD.Ovarian.cancer.cell
0.00 0.25 0.50 0.75 1.00



CARD.Plasma.cell
0.00 0.25 0.50 0.75 1.00



CARD.T.cell
0.00 0.25 0.50 0.75 1.00

