Analysis of melanoma and pancreatic ductal adenocarcinoma (PDAC) spatial transcriptomics data

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Spatially Resolved Transcriptomics Enables Dissection of Genetic Heterogeneity in Stage III Cutaneous Malignant Melanoma

Kim Thrane[1], Hanna Eriksson[2,3], Jonas Maaskola[1], Johan Hansson[2,3], and Joakim Lundeberg[1]
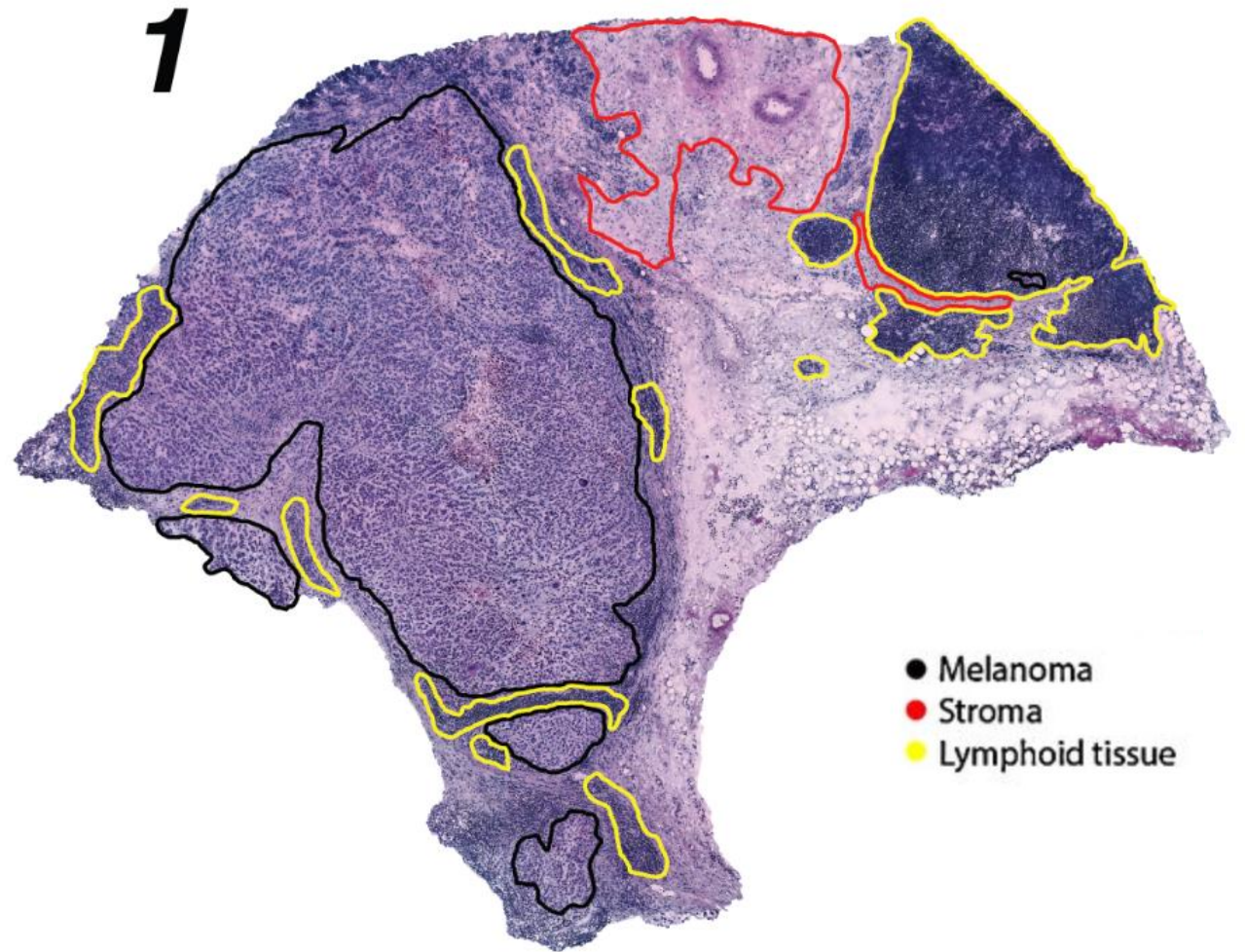
Check for updates

Integrating microarray-based spatial transcriptomics and single-cell RNA-seq reveals tissue architecture in pancreatic ductal adenocarcinomas
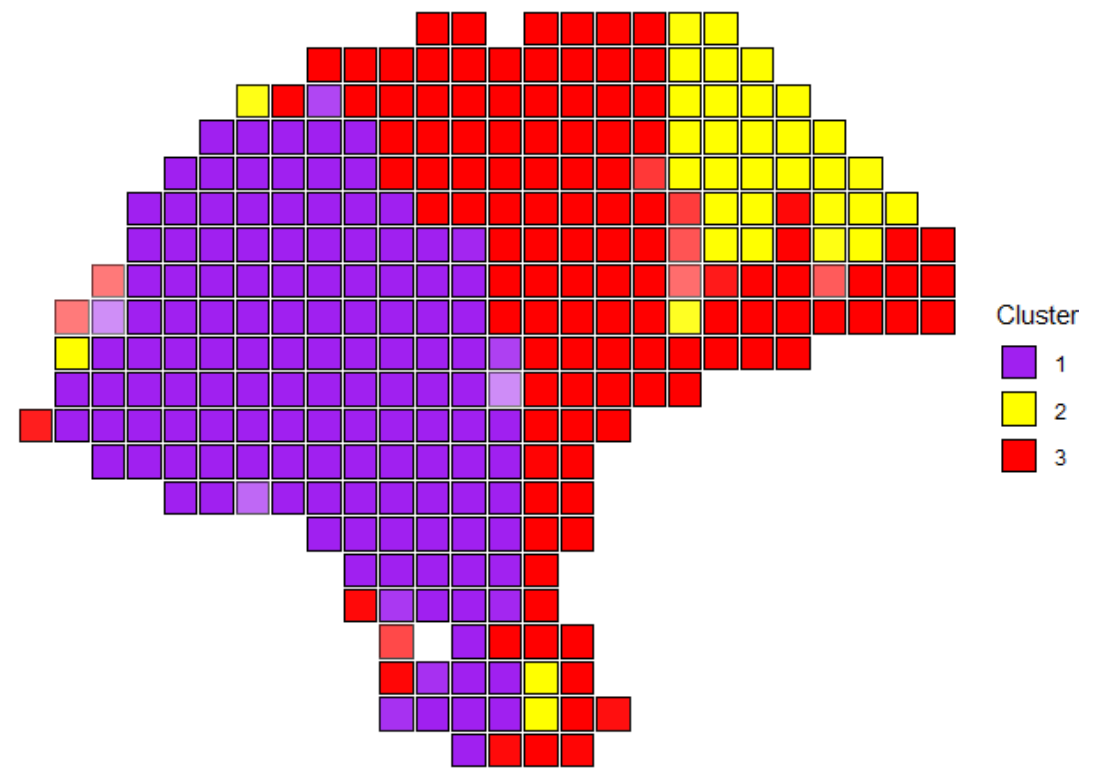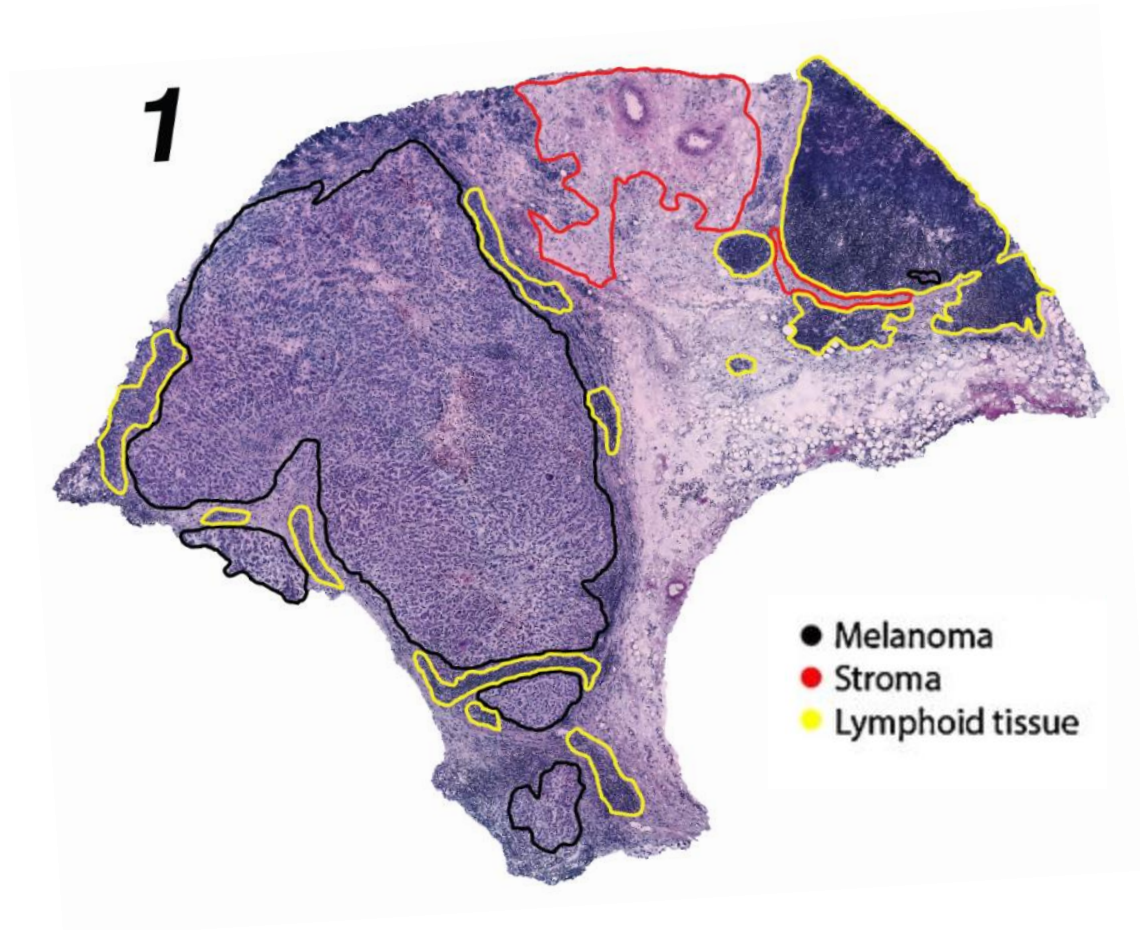
Reuben Moncada[1], Dalia Barkley[1], Florian Wagner[1], Marta Chiodin[1], Joseph C. Devlin[1], Maayan Baron[1], Cristina H. Hajdu[2], Diane M. Simeone[2,3,4] and Itai Yanai[1,5*]

Sample Melanoma 1

- H&E staining image annotated for histological features (left)

- Each spot (100μm diameter) on spatial transcriptomics (ST) data contains 5-40 cells
    - New VISIUM technology is 55μm diameter

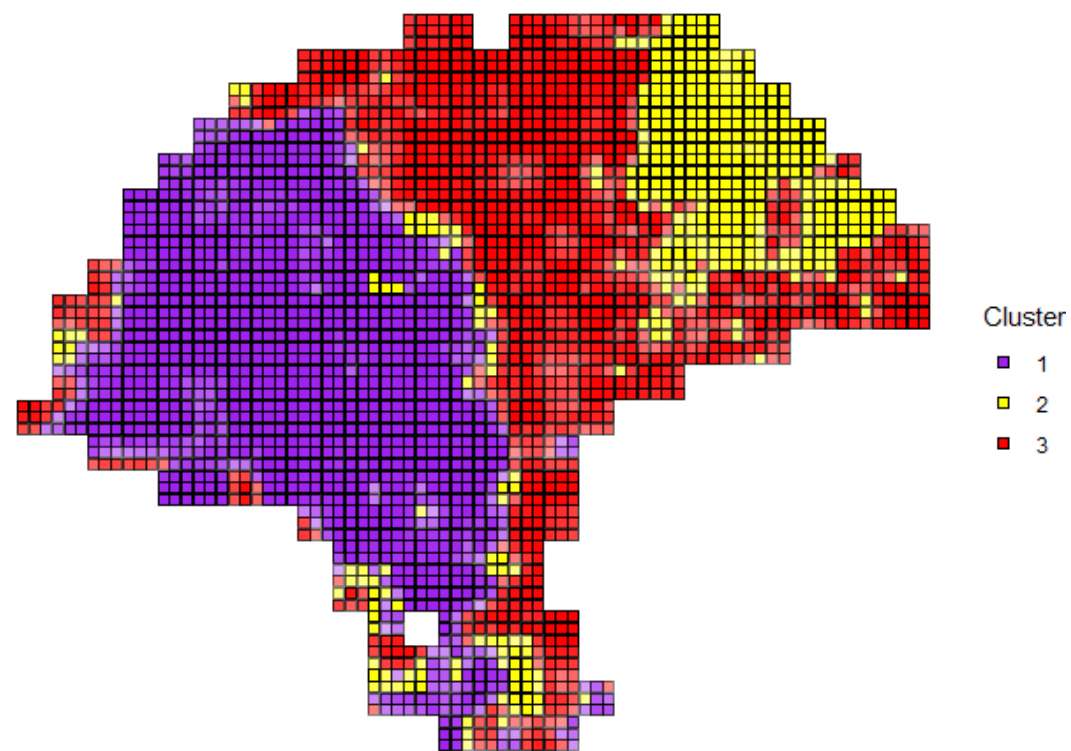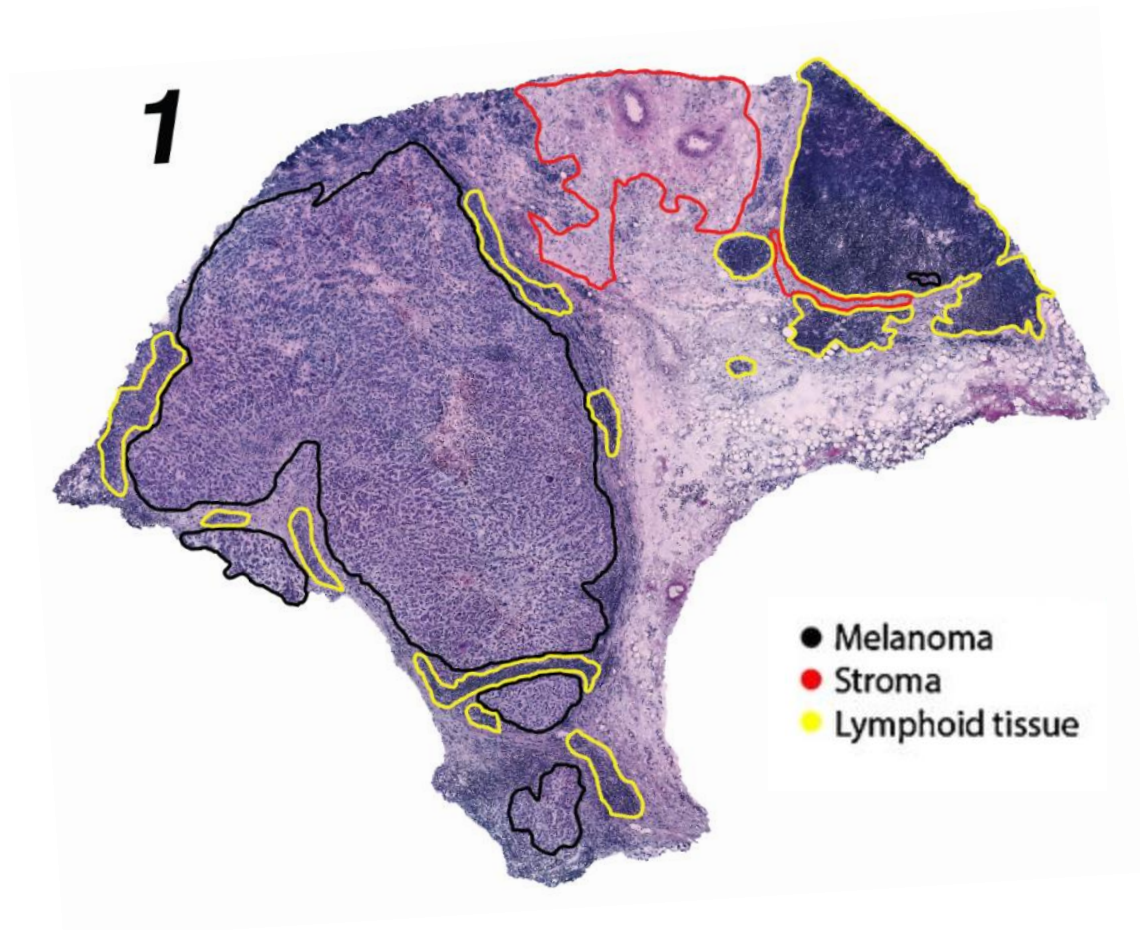- Hierarchical clustering on top PCs derived from highly variable genes (right)

- ● Melanoma
- ● Stroma
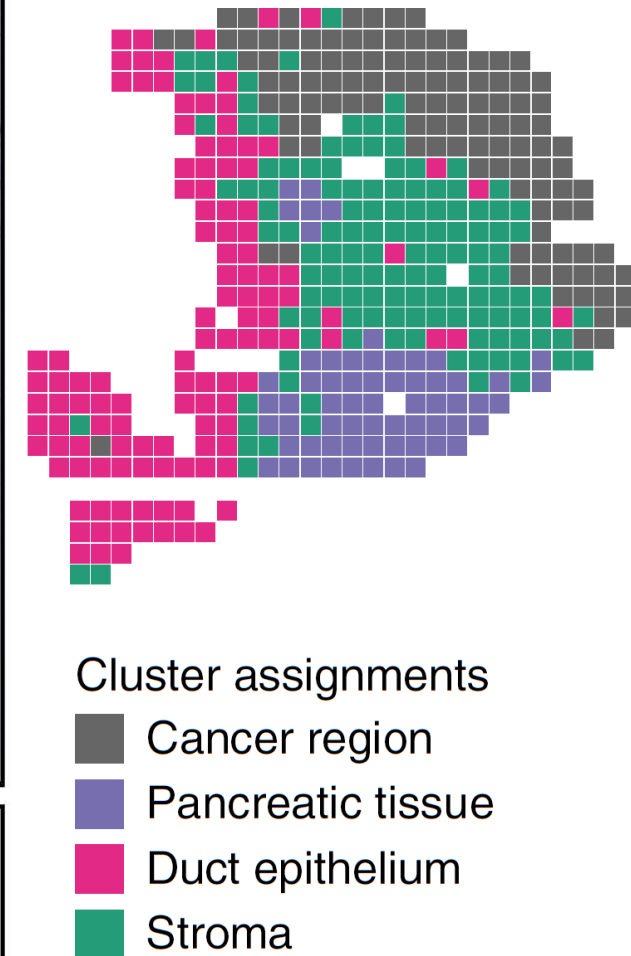- ● Lymphoid tissue

Thrane et al., 2020

Spatial clustering

Melanoma
Stroma
Lymphoid tissue

Cluster
1
2
3

Spatial deconvolution

Melanoma
Stroma
Lymphoid tissue

Cluster
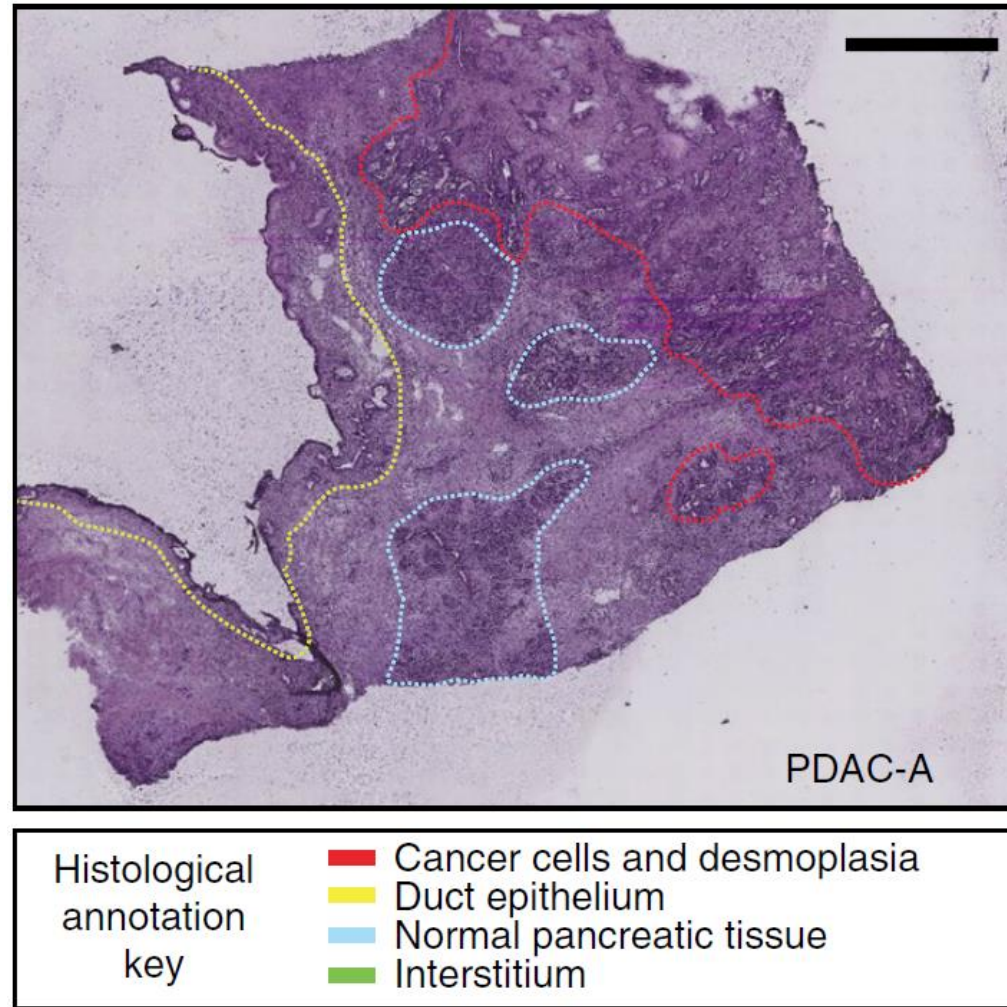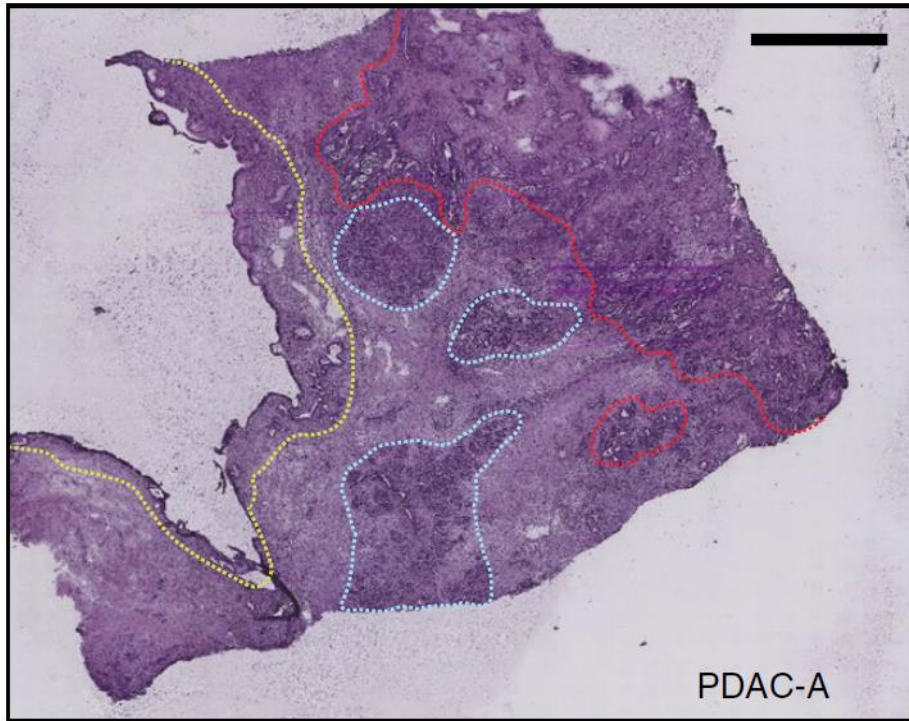1
2
3

Sample PDAC-A

- H&E staining image annotated for histological features (left)

- Each spot (100μm diameter) on spatial transcriptomics (ST) data contains 20-70 cells
  - New VISIUM technology is 55μm diameter

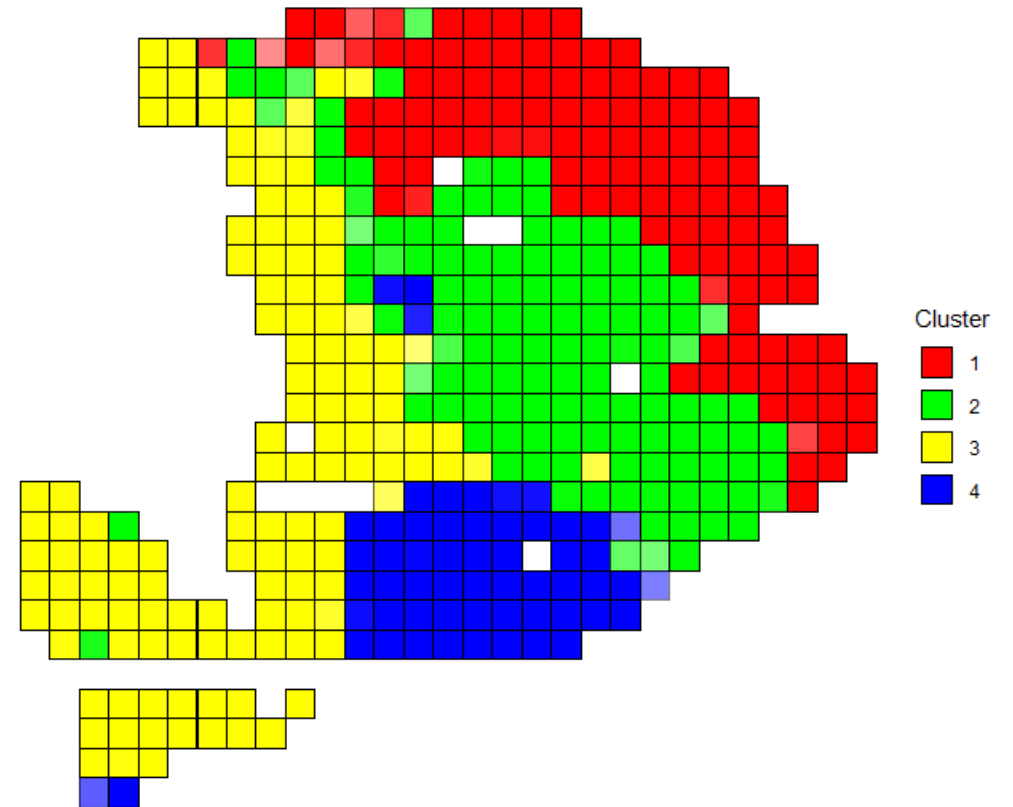- Hierarchical clustering on top PCs derived from highly variable genes (right)

PDAC-A

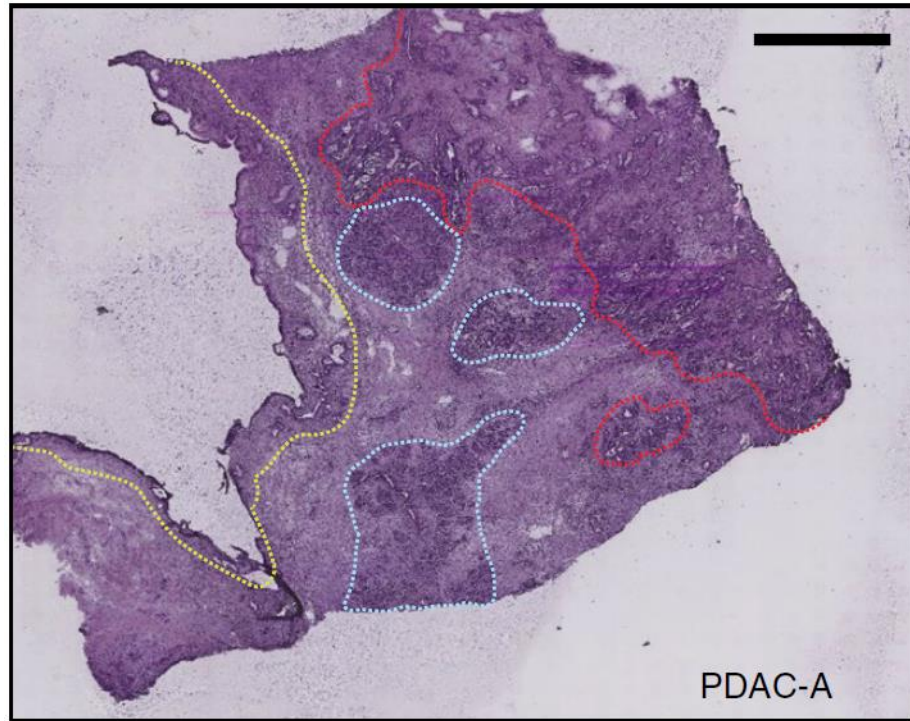| Histological annotation key	Cancer cells and desmoplasia
	Duct epithelium
	Normal pancreatic tissue
	Interstitium

Cluster assignments
- Cancer region
- Pancreatic tissue
- Duct epithelium
- Stroma

Moncada et al., 2020

Spatial Clustering

Histological annotation key
- Cancer cells and desmoplasia
- Duct epithelium
- Normal pancreatic tissue
- Interstitium

PDAC-A
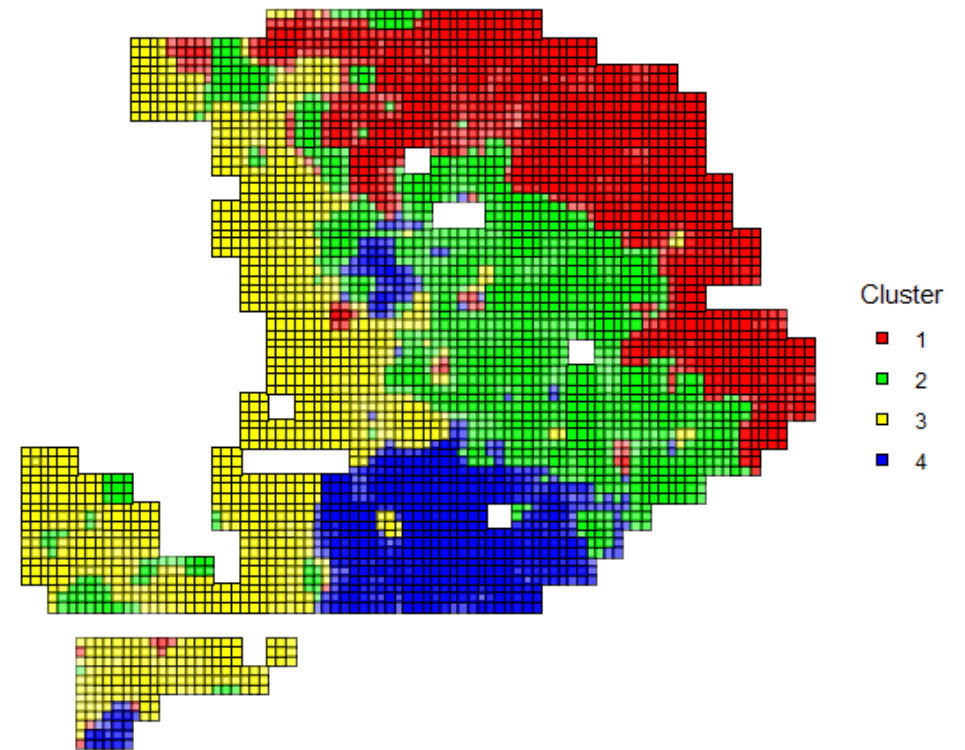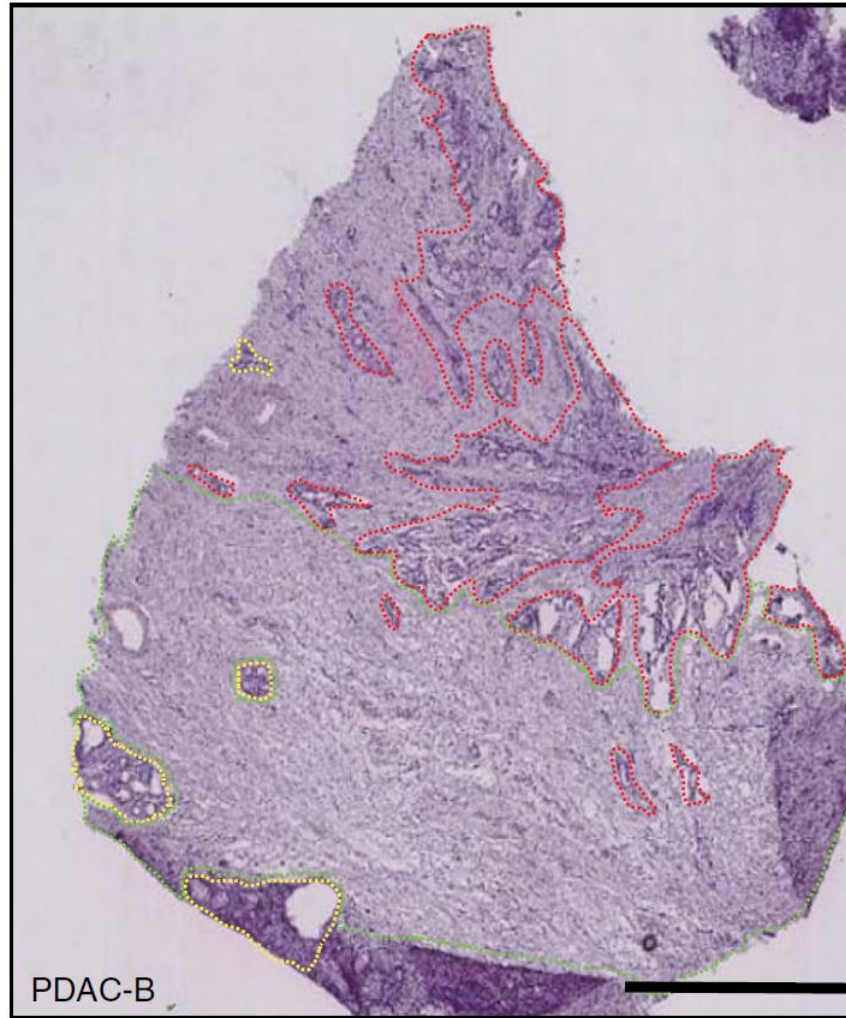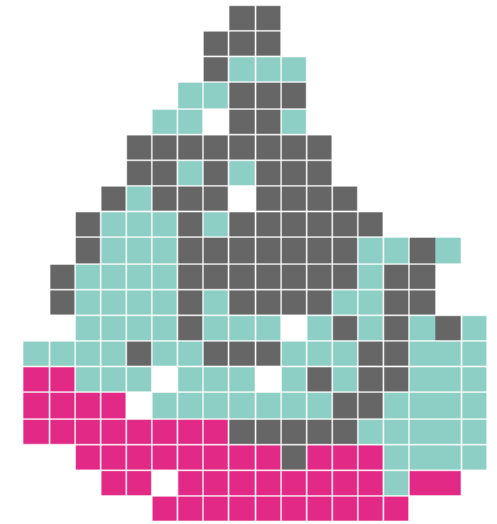
Cluster
1
2
3
4

Spatial Deconvolution

Sample PDAC-B

- H&E staining image annotated for histological features (left)

- Each spot (100μm diameter) on spatial transcriptomics (ST) data contains 20-70 cells
  - New VISIUM technology is 55μm diameter

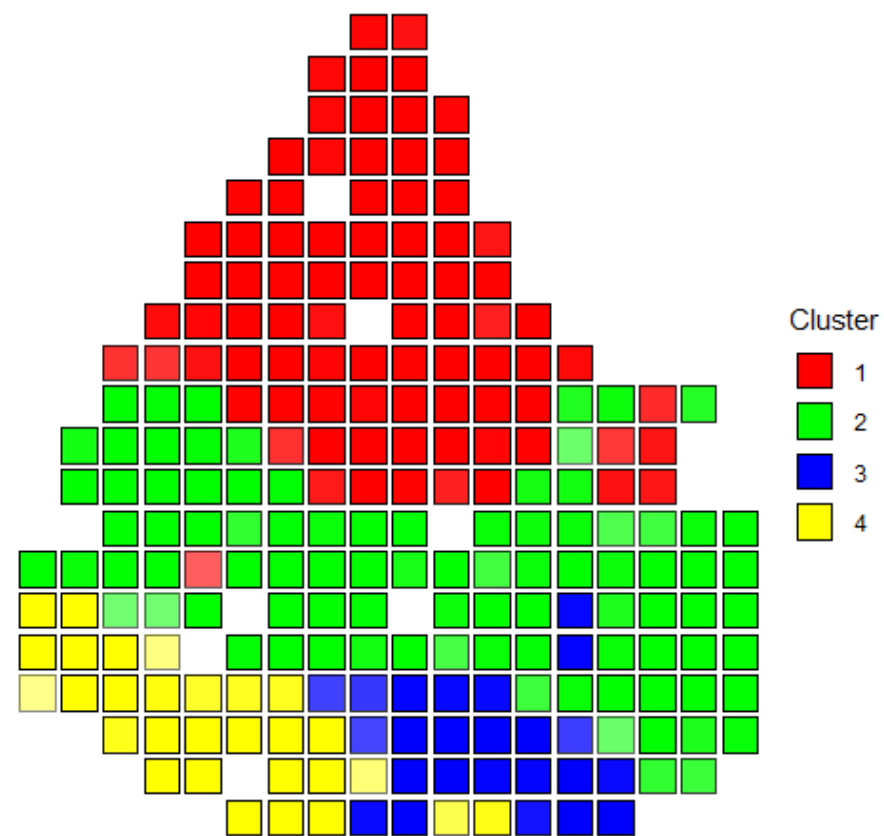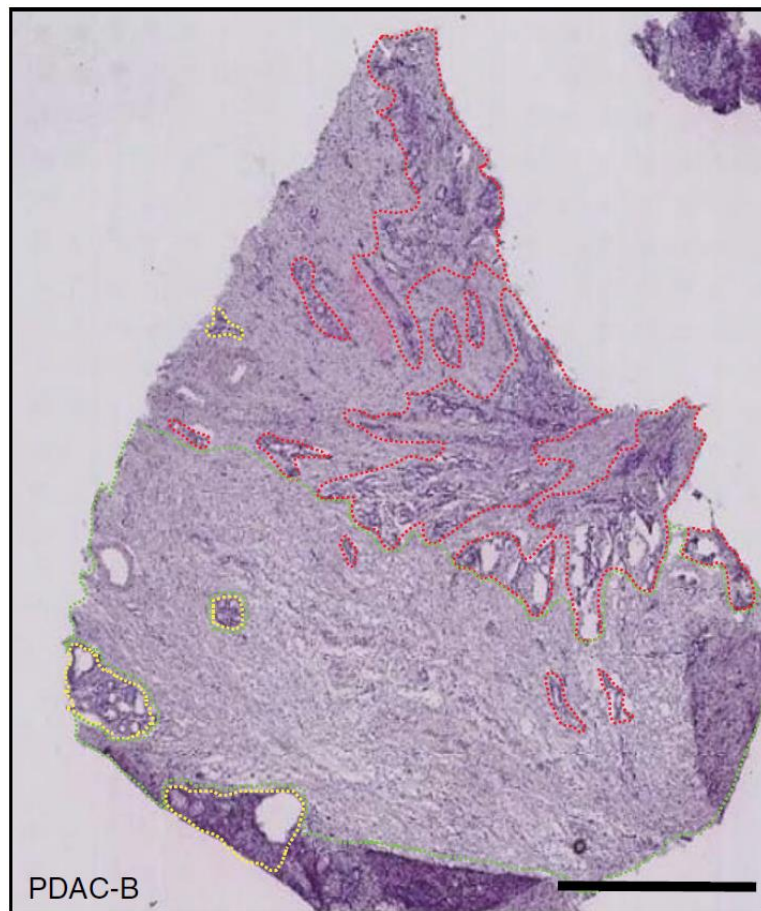- Hierarchical clustering on top PCs derived from highly variable genes (right)

PDAC-B

Cluster assignments
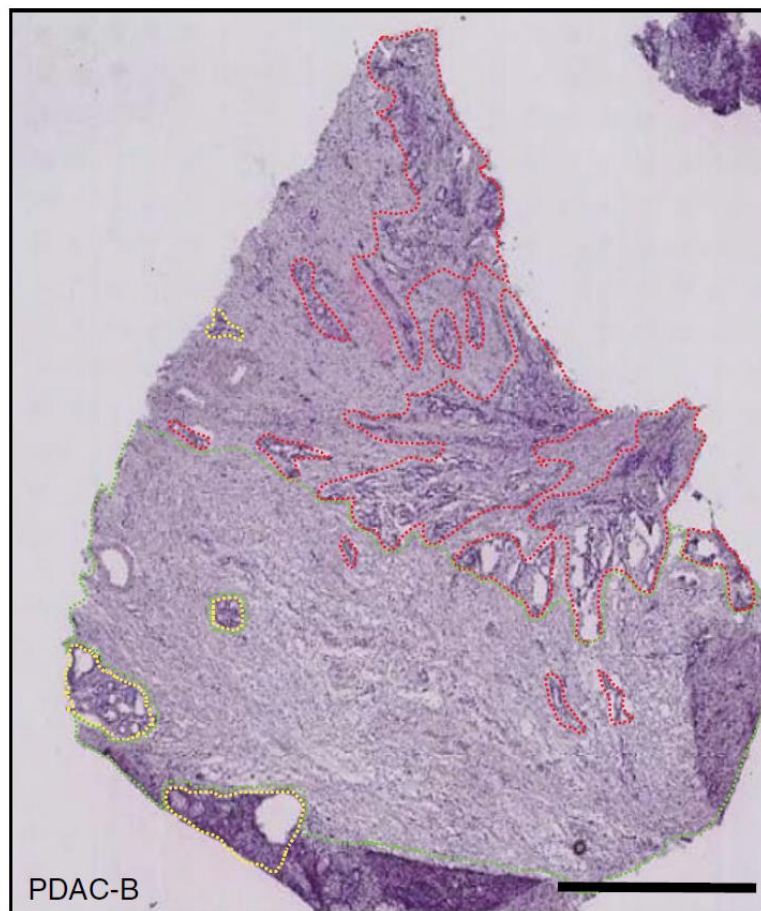- Cancer region
- Interstitium
- Duct epithelium

Histological annotation key
- Cancer cells and desmoplasia
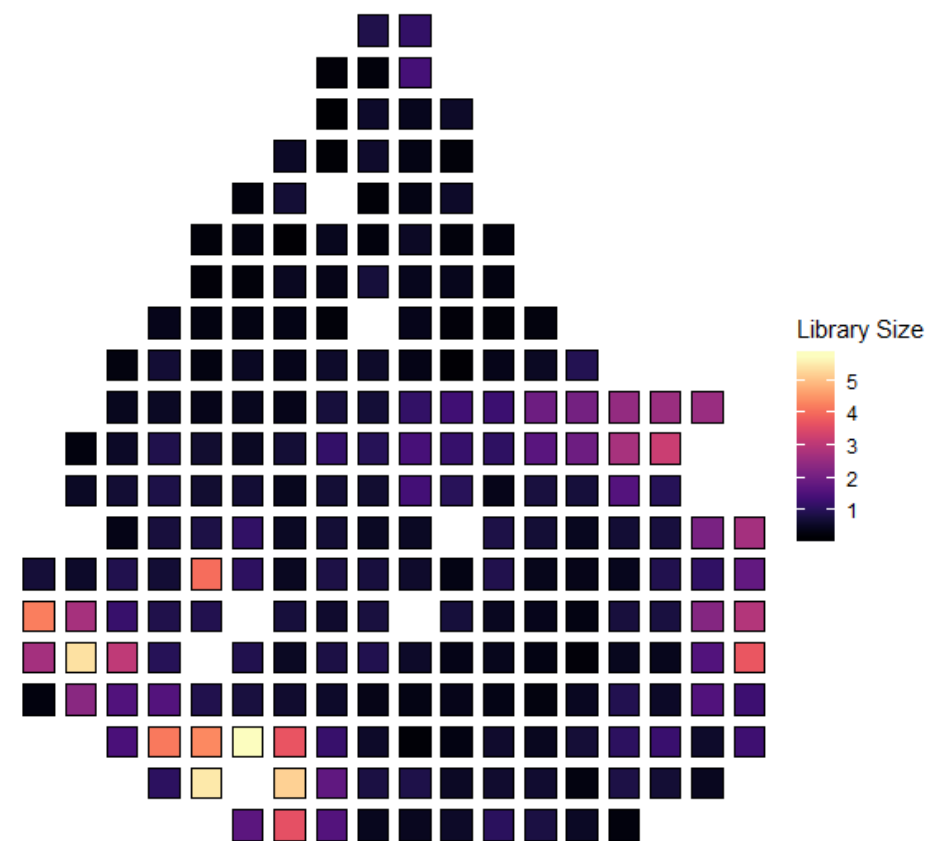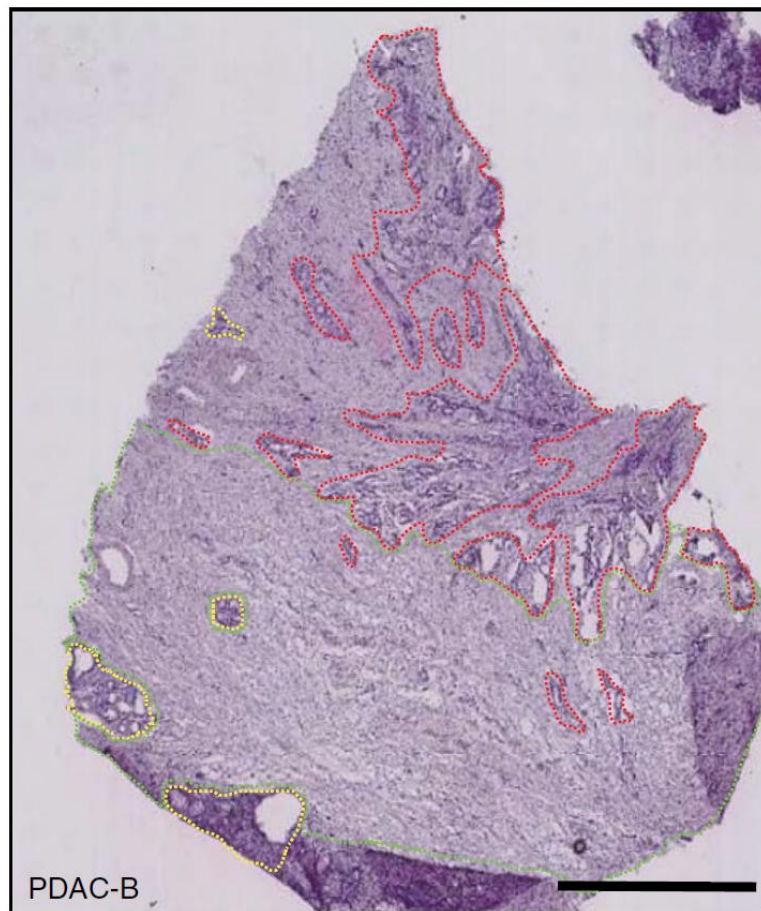- Duct epithelium
- Normal pancreatic tissue
- Interstitium

Moncada et al., 2020

Spatial clustering

Spatial Deconvolution
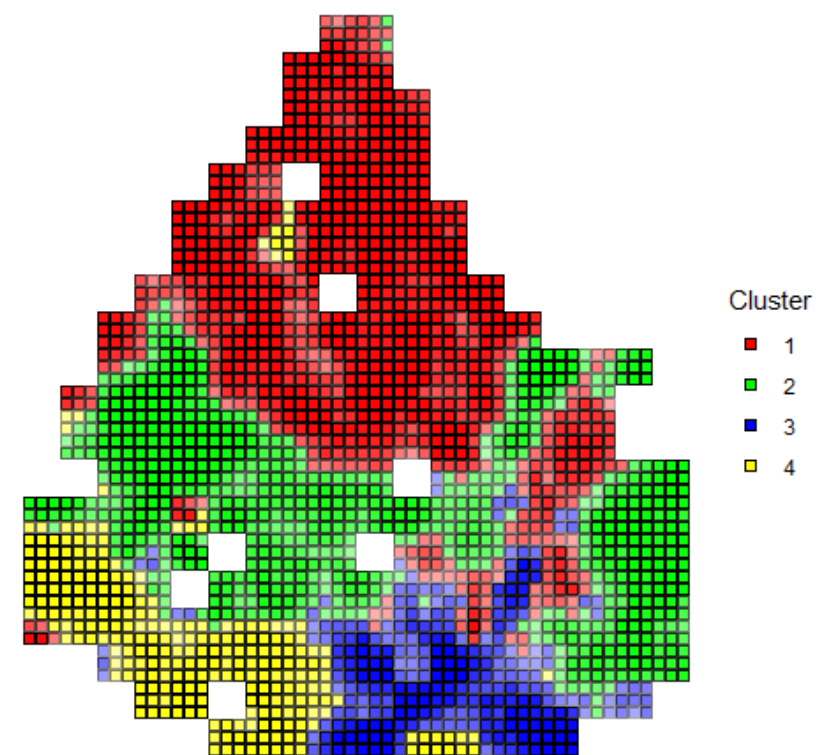
Library size

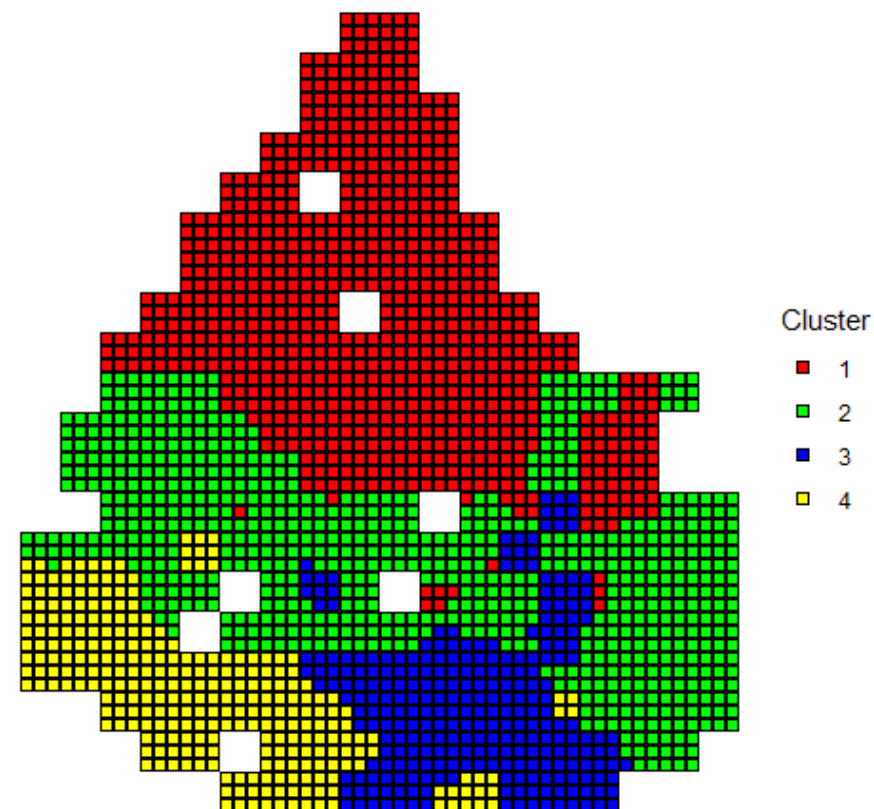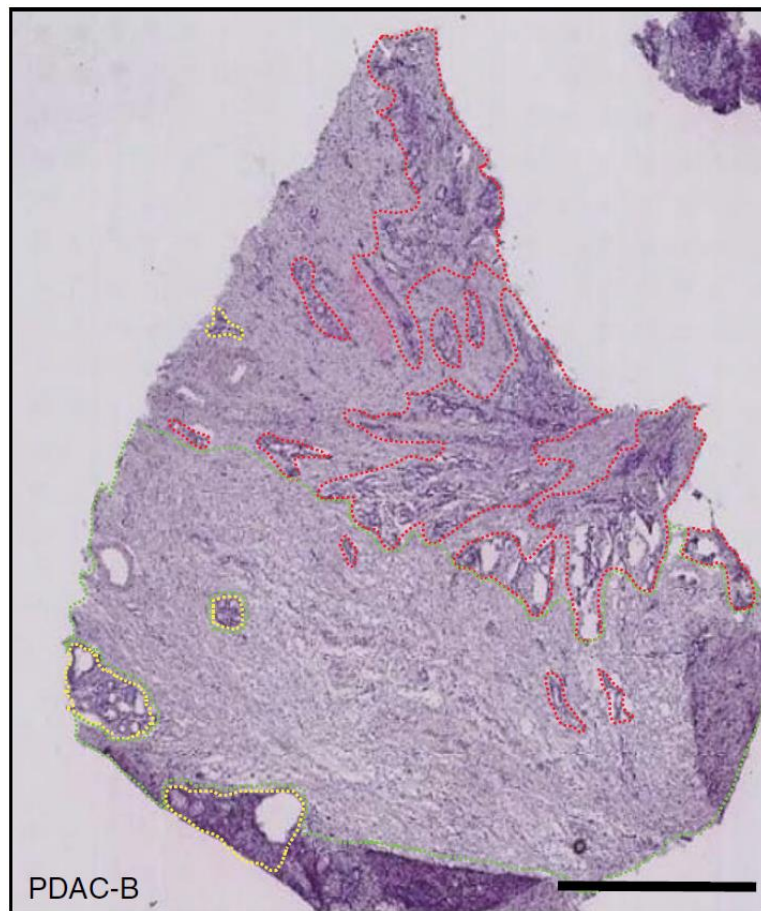# Spatial edge refinement

- ● Melanoma
- ● Stroma
- ● Lymphoid tissue

Cluster
- ■ 1
- ■ 2
- ■ 3
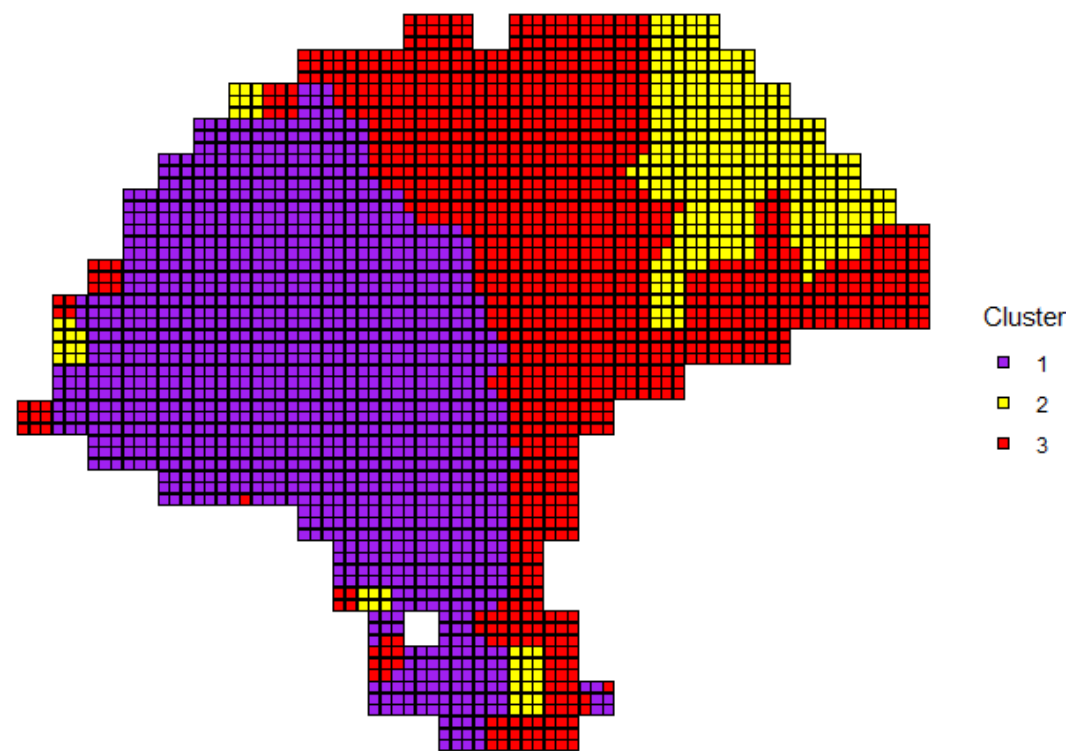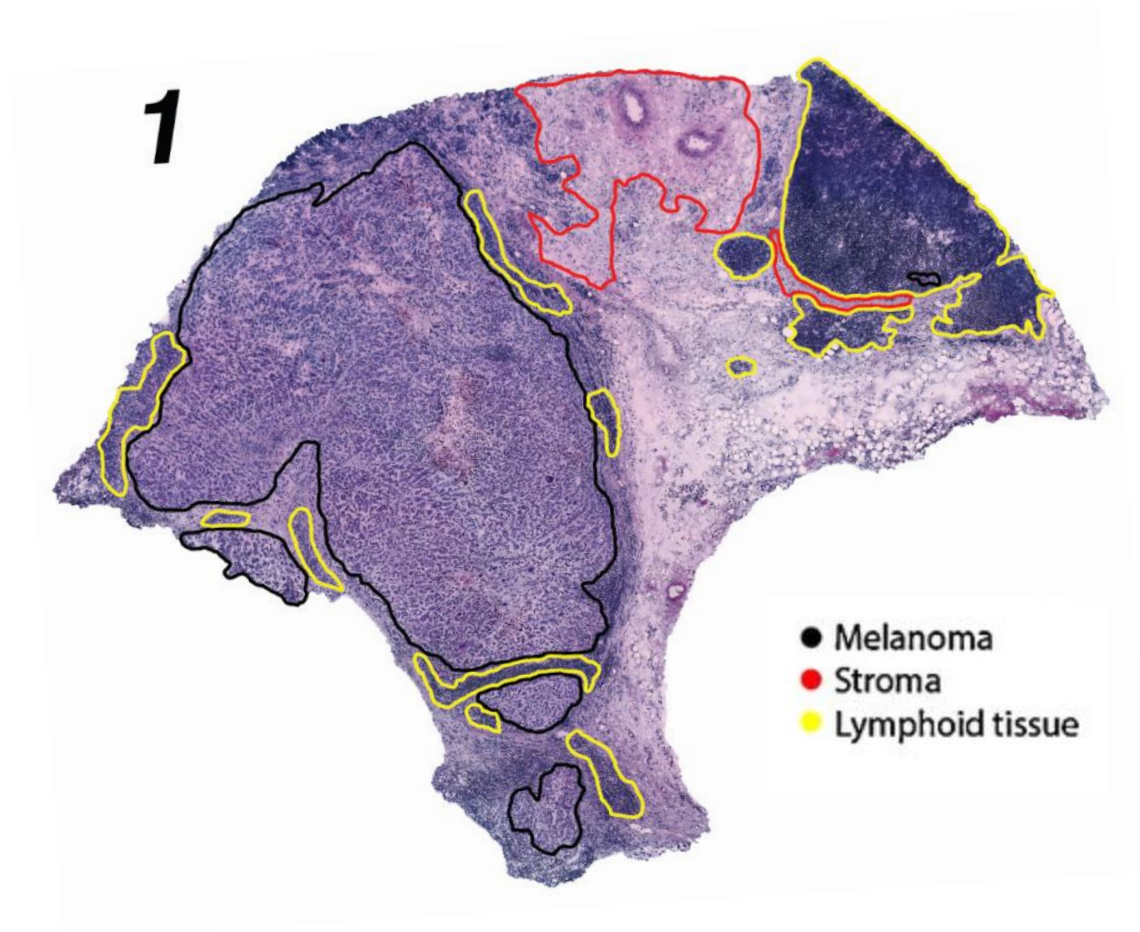
Spatial Deconvolution

Spatial Deconvolution

Histological annotation key

🟥	Cancer cells and desmoplasia
🟨	Duct epithelium
🟦	Normal pancreatic tissue
🟩	Interstitium

PDAC-A

Cluster
- 🟥 1
- 🟩 2
- 🟨 3
- 🟦 4