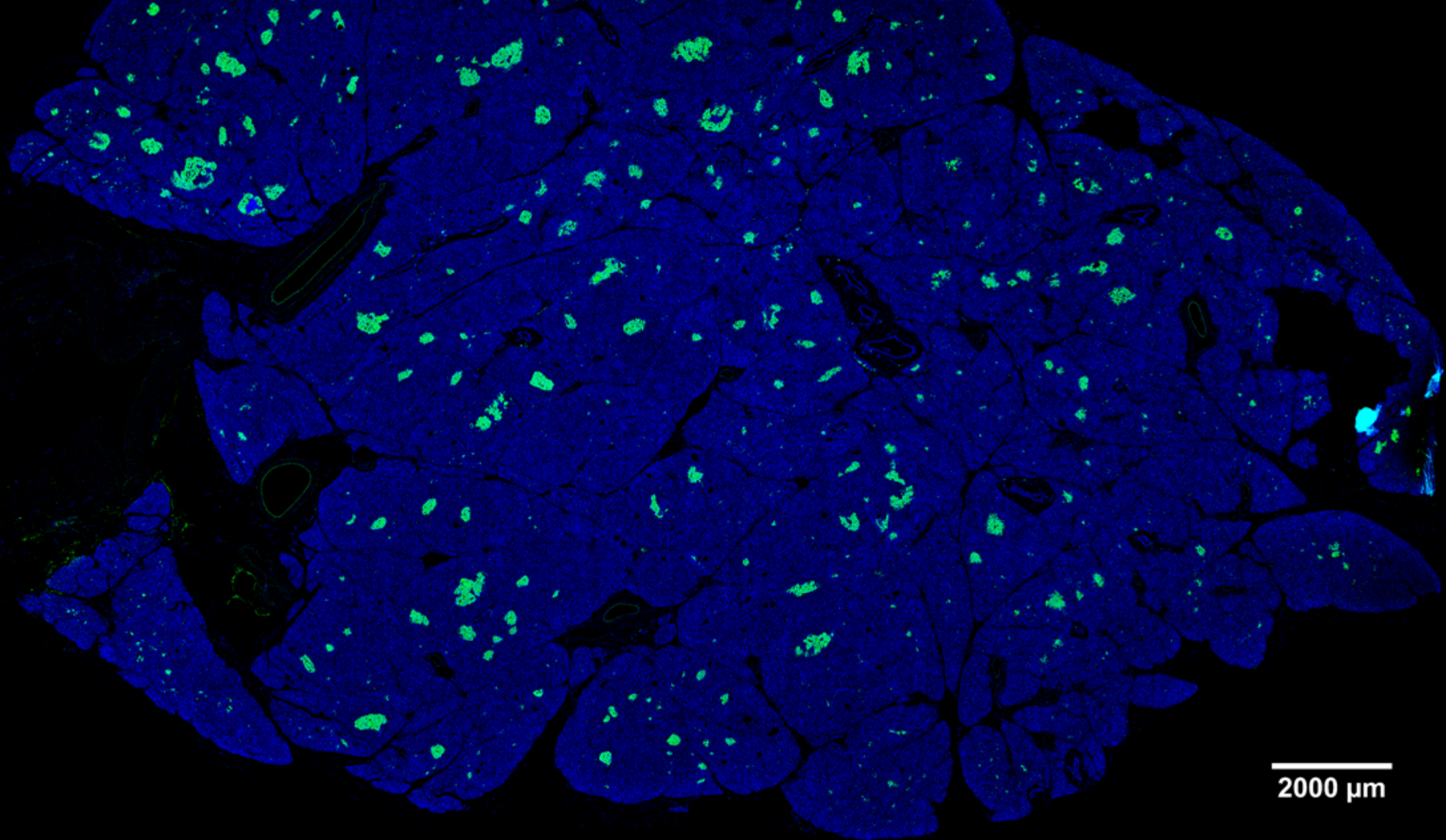
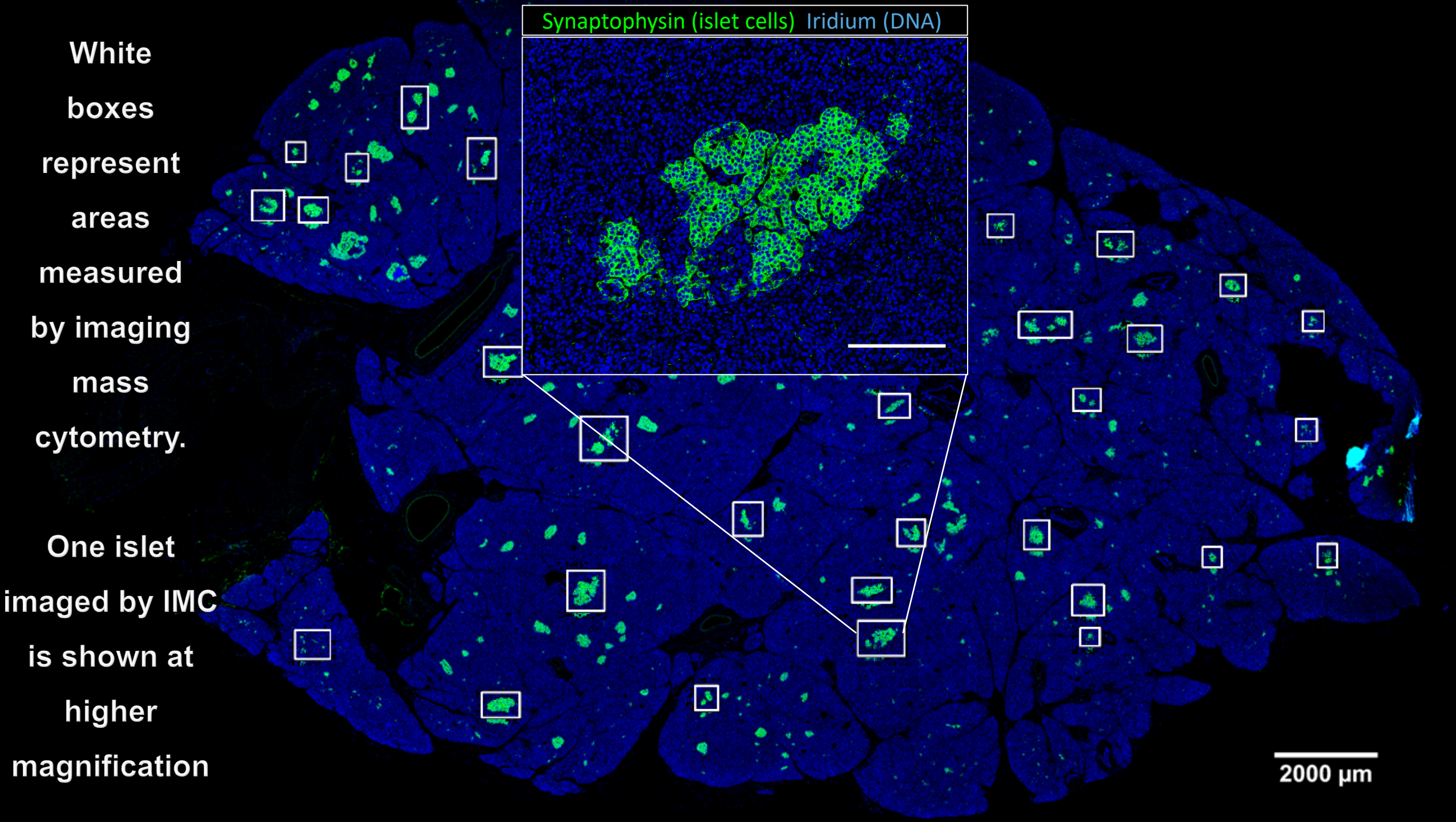


Pancreas section from a donor with recent-onset Type 1 Diabetes imaged by immunofluorescence, with pancreatic islets shown in green

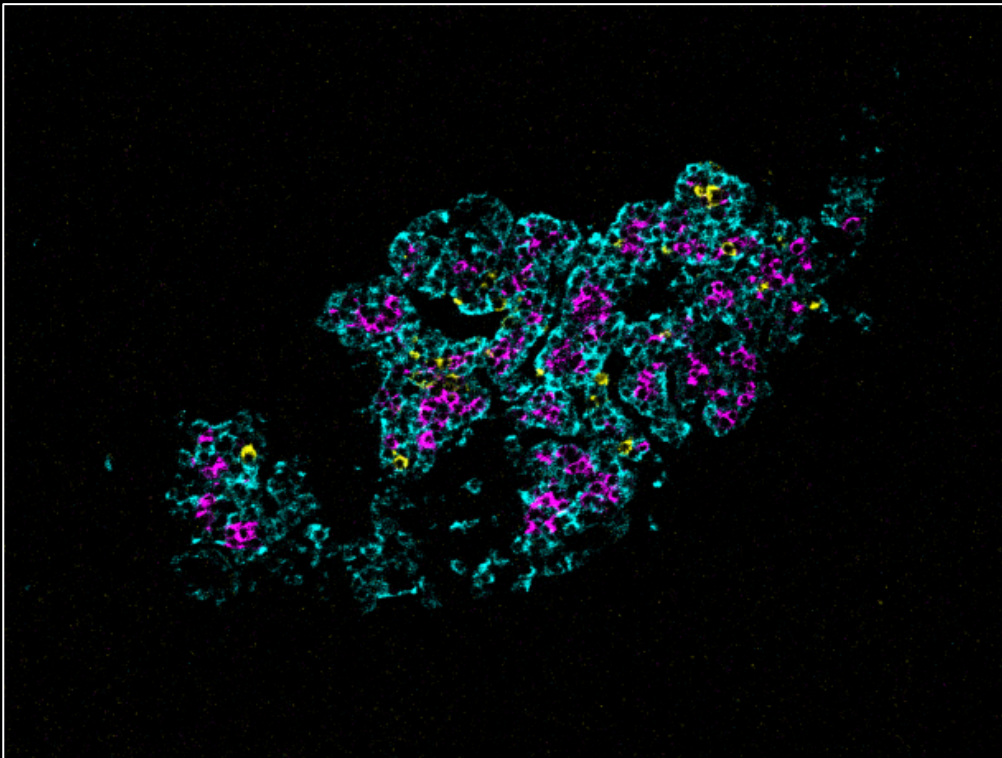




Same islet as on the previous slide, but different proteins are shown

Left: pancreatic hormones, each representing a different islet cell type.

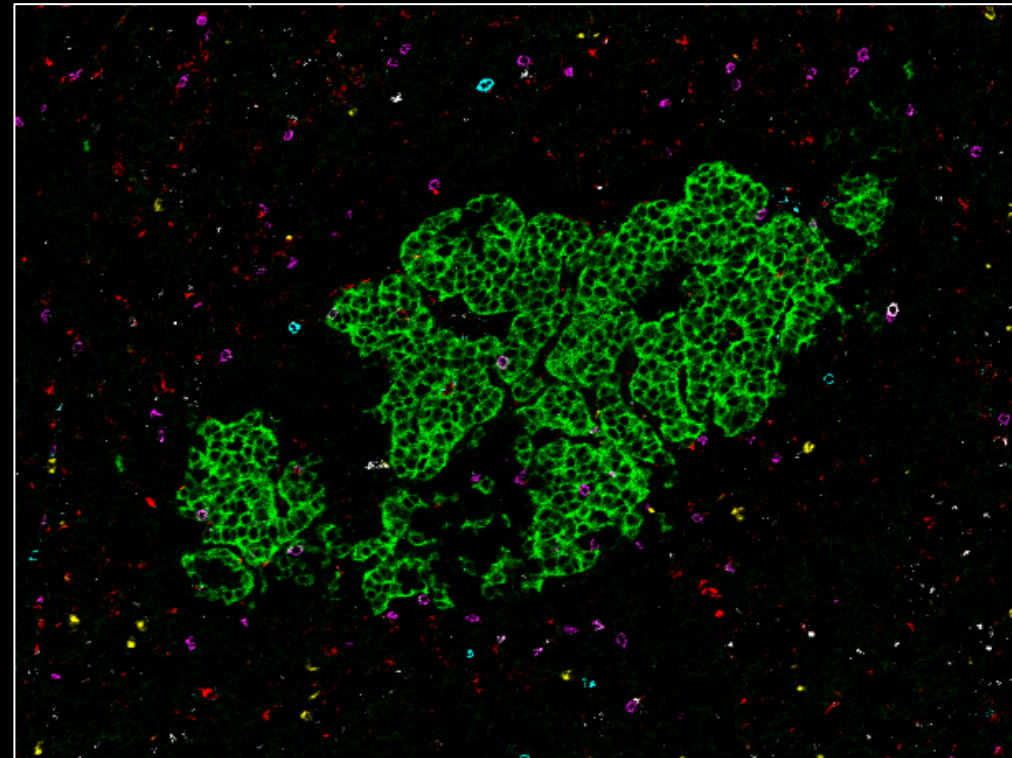
Insulin: β cells
Glucagon: α cells
Somatostatin: δ cells



Glucagon Insulin Somatostatin

Right: Immune cells surrounding the islet (shown in green).

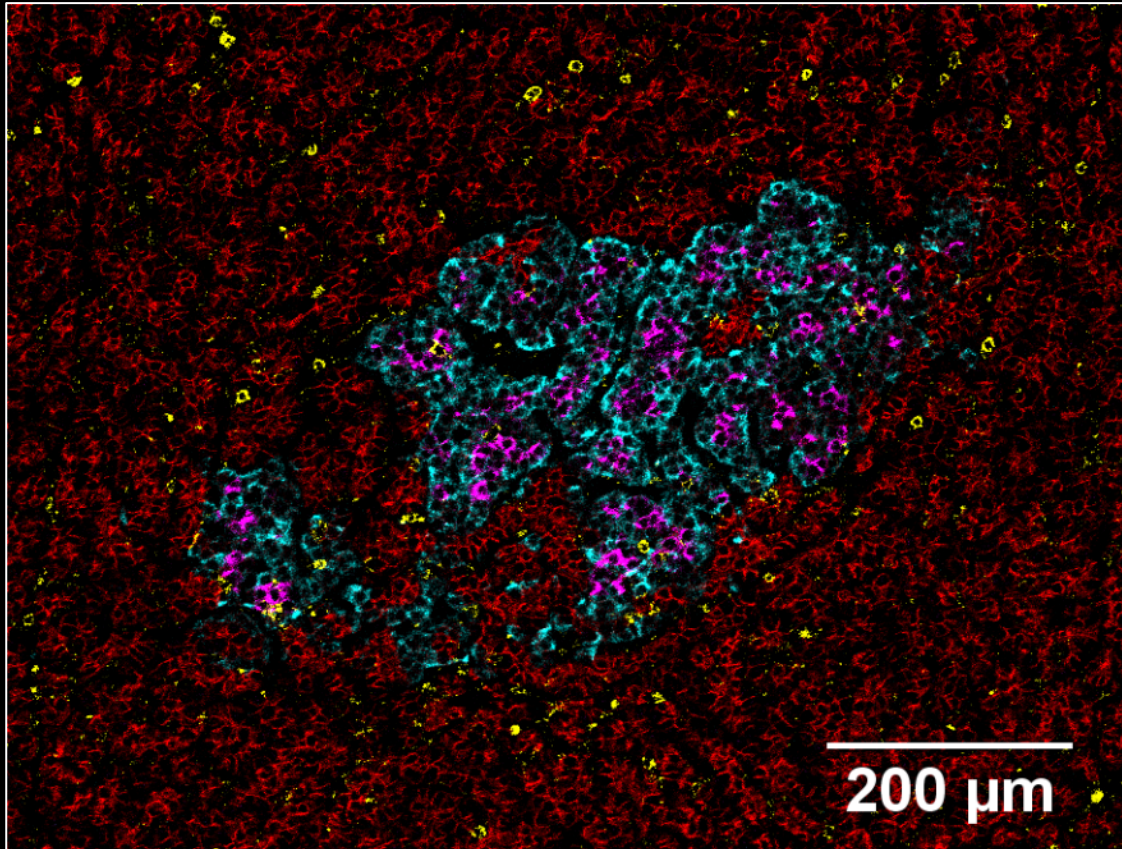
CD4: helper T cells
CD8: cytotoxic T cells
CD20: B cells
CD68: Macrophages
MPO: Neutrophils



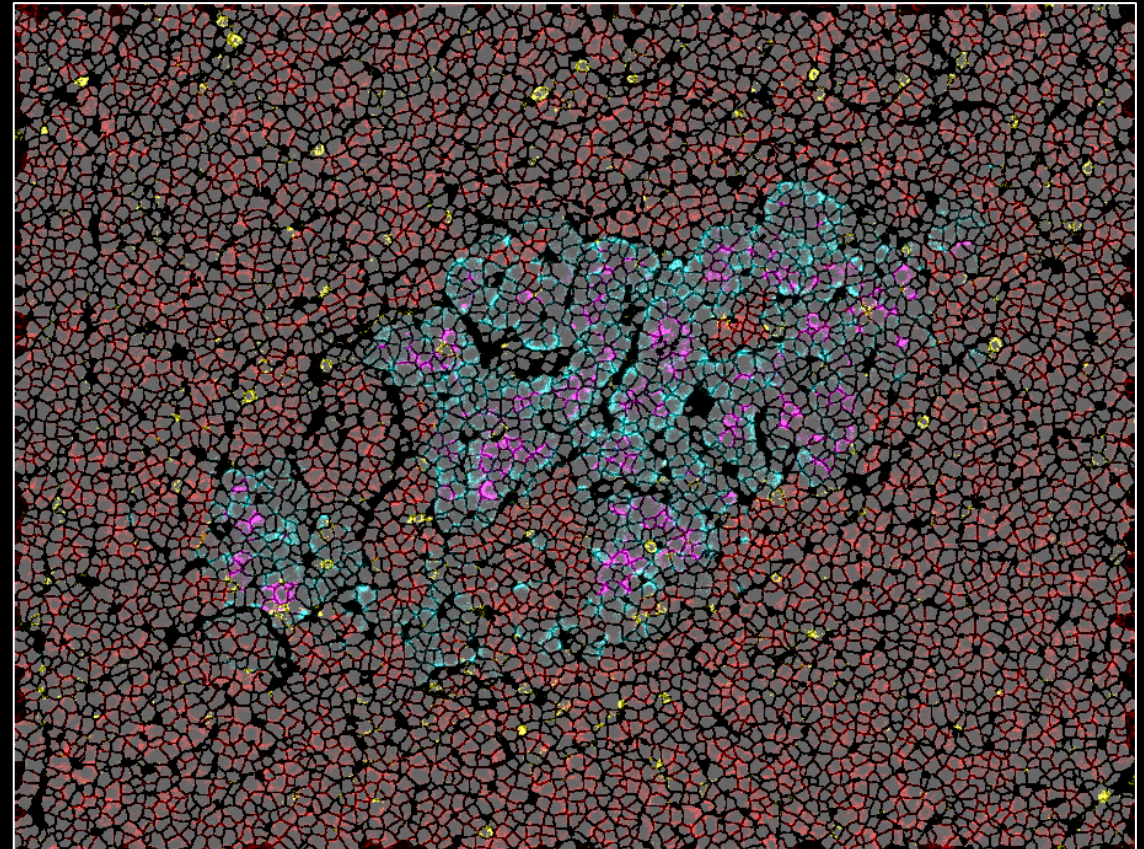
Synaptophysin CD4 CD8 CD68 MPO CD20

“Segmentation” enables extraction of single-cell information from images

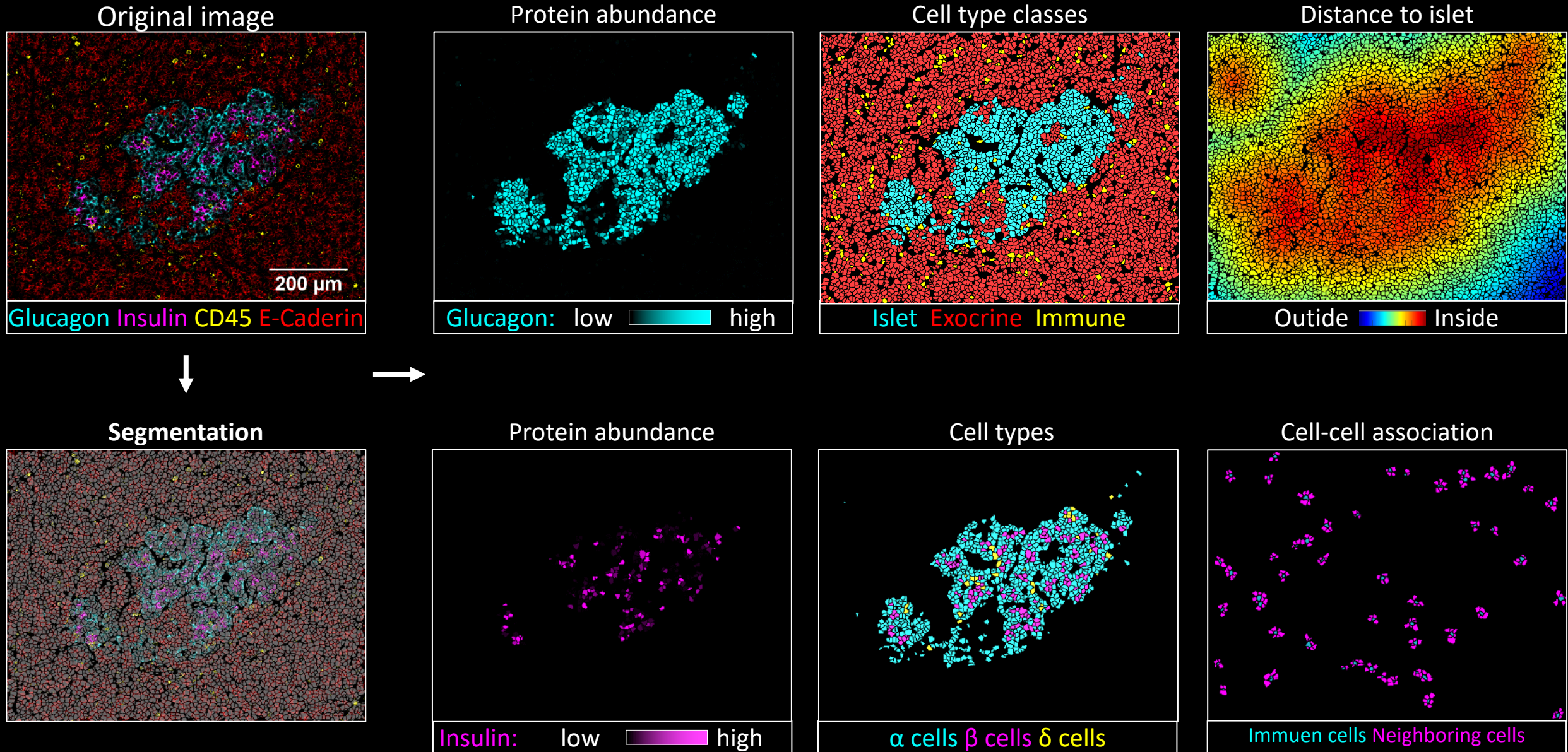
Original IMC image



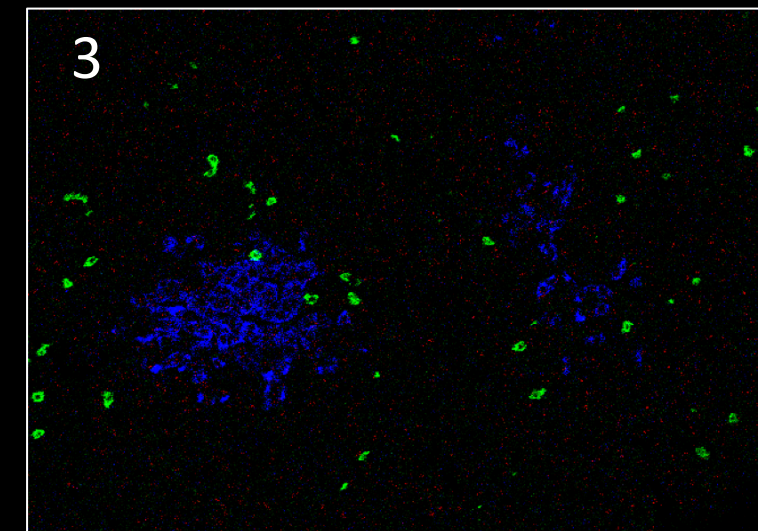
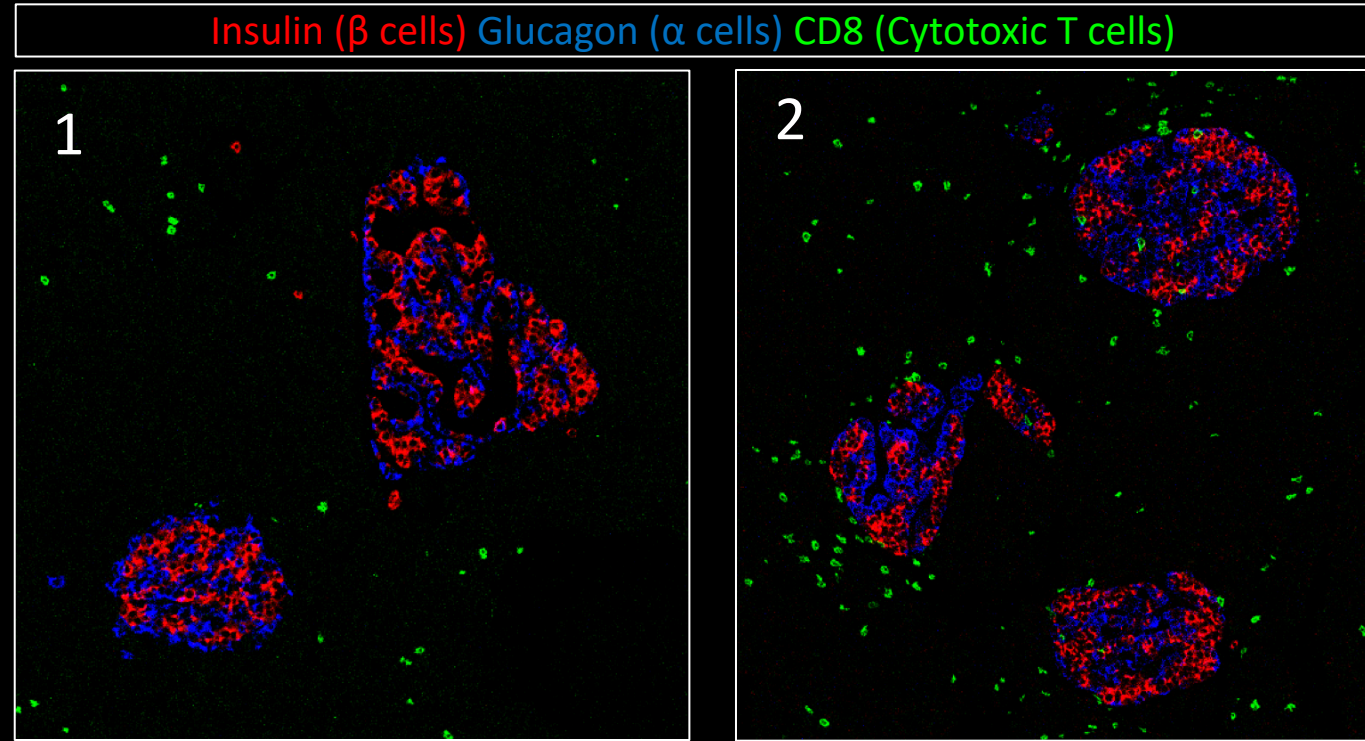
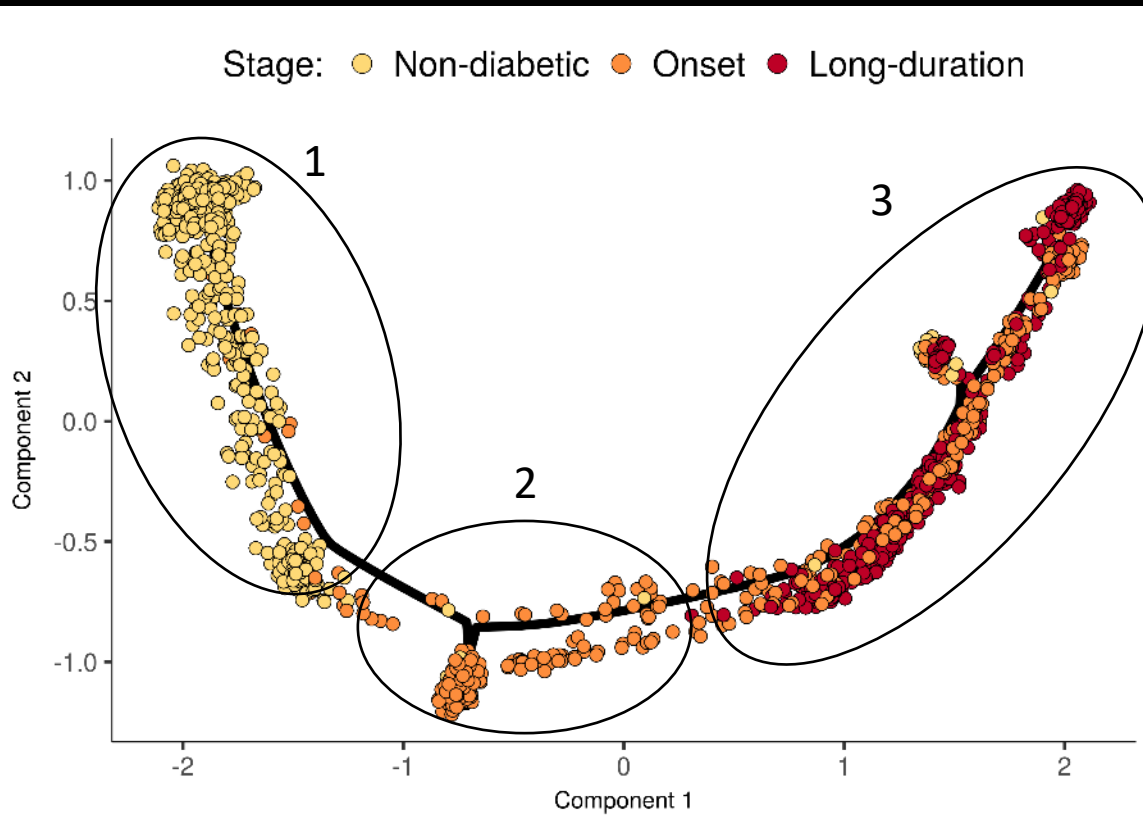
Mask showing cell borders overlaid on the image



Type of information that can be extracted from IMC images



Reconstruction of islet evolution based on islet expression profiles



1. Healthy islet (from a non-diabetic donor)

2. Early stages (around diagnosis): β cells are still present but have an altered phenotype (not visible here). Islets are surrounded and infiltrated by immune cells

3. Late stages (from diagnosis to > 10 years later): β cells have been destroyed. Less immune cells around the islets