1

Single Cell Data

- HALO
- QuPath
- CSV files
- Visiopharm
- IMC

Single cell data

2

Data Ingestion

- Add new annotations
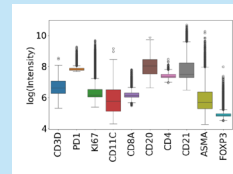- Manual phenotyping
- Subsampling
- Pin color mapping

Manual phenotyping via phenotypes codes

3

Visualization

- Histogram
- Relational heatmap
- Boxplot
- Sankey plot
- Heatmap
- Scatter plot
- Hierarchical clustering

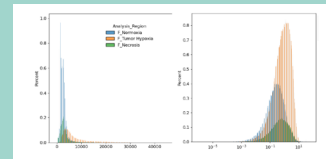**Distribution of annotations or features**

Relation analysis between annotations

4

Data Preprocessing

- Arcsinh transformation
- Z-score normalization
- Quantile normalization
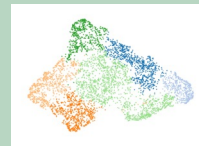- Batch correction
- Rescaling

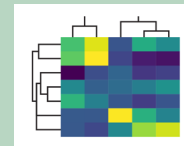**Feature expression before vs. after z-score normalization**

5

Clustering and Phenotyping

- Phenograph clustering
- tSNE/UMAP
- UTAG clustering
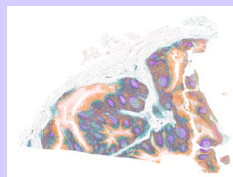- Spatial UMAP

Clustering and phenotyping identification

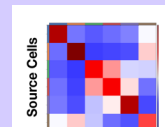**Hierarchical clustering and feature expression**
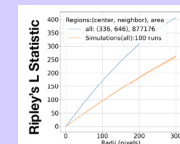
6

Spatial Analysis

- Interactive spatial plot
- Nearest neighbor
- Cluster interaction matrix
- Neighborhood enrichment
- Ripley's L
- Spatial hypothesis testing

Spatial distribution

Neighborhood enrichment

Ripley's L