Input

scRNA-seq transcriptomics

- Cell Type A
- Cell Type B
- Cell Type C

SOCIAL
Single-cell Transcript**O**mics
Cell-Cell **I**nteraction **AL**gorithm
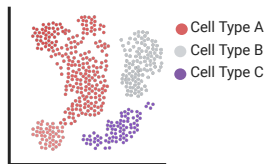
1) Query the LIRICS database

Ligands | Receptors

Cell Type A | Cell Type B
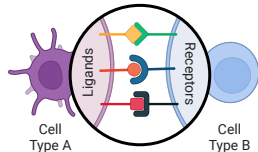
2) Compute Interaction Score

Ligand X
Receptor Y

Cell Type A | Cell Type B
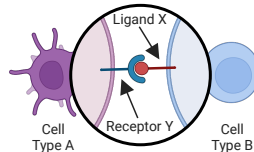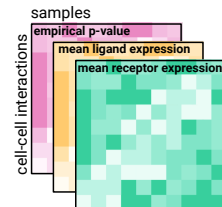
Interaction Score = Cell Type A Receptor Y * Cell Type B Ligand X

3) Permutation test (via shuffling cell type)

Proportion

empirical p-value
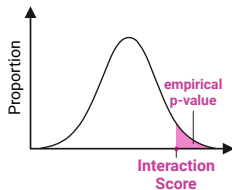
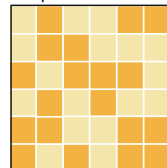Interaction Score

4) Accommodate for variations across samples (optional)

samples

empirical p-value
mean ligand expression
mean receptor expression

cell-cell interactions

Output

cell-type-specific ligand-receptor interaction activity

samples

- Likely to occur
- Unlikely to occur