

# Cell-Cell Communication

## Infering Cell-Cell Interactions from scRNA-seq

**Ligand-Receptor Interaction**

TNF→TNFR | IL6→IL6R | VEGFA→FLT1

**Communication Inference Tools**

- CellPhoneDB**
  - Statistical framework
    - Permutation test
    - Multi-subunit
    - Spatial optional
- NicheNet**
  - Gene regulatory
    - Prior knowledge
    - Target prediction
    - Prioritization
- CellChat**
  - Network analysis
    - Pattern recognition
      - Visualization
      - Comparison

**Typical Analysis Outputs**

- Interaction Heatmap**

	T	B	Mo	DC
T	High	Low	Low	Low
B	Low	High	Low	Low
Mo	High	Low	High	Low

Cell type pairs
- Network Graph**

Interaction strength
- Dot Plot**

Size: p-value  
Color: mean expr
- Spatial Context**

Physical proximity → Higher confidence



Infer cellular communication from expression patterns