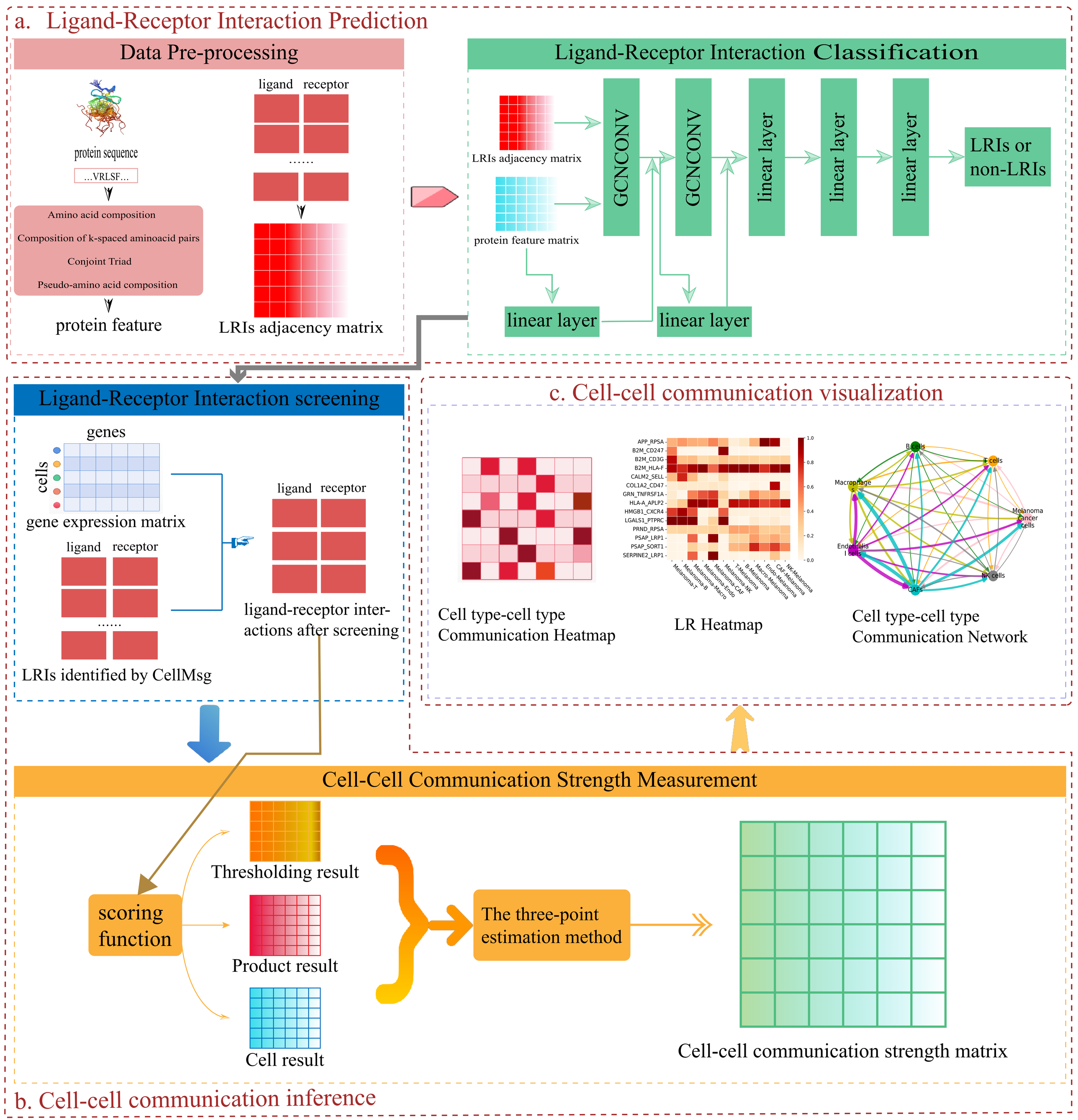
a. Ligand-Receptor Interaction Prediction
Data Pre-processing
protein sequence
...VRLSF...
Amino acid composition
Composition of k-spaced aminoacid pairs
Conjoint Triad
Pseudo-amino acid composition
protein feature
ligand
receptor
.....
LRIs adjacency matrix
Ligand-Receptor Interaction Classification
LRIs adjacency matrix
protein feature matrix
GCNCONV
GCNCONV
linear layer
linear layer
linear layer
linear layer
linear layer
LRIs or non-LRIs
Ligand-Receptor Interaction screening
genes
cells
gene expression matrix
ligand
receptor
.....
LRIs identified by CellMsg
ligand
receptor
ligand-receptor inter-actions after screening
c. Cell-cell communication visualization
Cell type-cell type Communication Heatmap
LR Heatmap
Cell type-cell type Communication Network
Cell-Cell Communication Strength Measurement
scoring function
Thresholding result
Product result
Cell result
The three-point estimation method
Cell-cell communication strength matrix
b. Cell-cell communication inference