

Cell Label Transfer Report

Methods

Reference data (human) with labels A/B was used to query two datasets:

- Matched query: cells with expected labels (from same distribution)
- Unmatched query: cells from outside distribution (query-unmatched)

Cosine kNN (k=3) with min vote fraction 0.6 was performed. For unmatched query, max cosine distance was set to 0.001 to increase stringency.

Results

Annotation Summary

Query Set	Assigned	Count
matched	True	4
unmatched	False	4

Detailed Annotations

Cell	Query Set	Predicted Label	Candidate Label	Vote Fraction	Assigned	Nearest Cosine Distance	Reference Neighbors
query0	matched	A	A	1.000000	True	0.000000	cell0;cell5;cell11
query1	matched	A	A	1.000000	True	0.000000	cell1;cell11;cell6
query2	matched	B	B	1.000000	True	0.000000	cell24;cell36;cell47
query3	matched	B	B	1.000000	True	0.000000	cell25;cell46;cell43
query0	unmatched	Unassigned	A	1.000000	False	0.022470	cell22;cell20;cell17
query1	unmatched	Unassigned	A	1.000000	False	0.022470	cell22;cell20;cell17
query2	unmatched	Unassigned	A	1.000000	False	0.022470	cell22;cell20;cell17
query3	unmatched	Unassigned	A	1.000000	False	0.022470	cell22;cell20;cell17

Assignment Visualization

image("out/assignment_bar.svg", width: 80%)

Conclusion

When using the reference data with default parameters (max cosine distance 0.5), all query cells were assigned with high confidence (vote fraction=1.0, distance 0). When increasing stringency for the unmatched query (max cosine distance 0.001), none of the query cells were assigned (all Unassigned), as their nearest cosine distance (0.022) exceeded the threshold. This demonstrates that the reference transfer tool correctly distinguishes between in-distribution and out-of-distribution inputs when appropriate distance thresholds are applied.

Generated Files

- Combined annotations: out/combined_annotations.csv
- Annotated H5AD (matched): out/reference-transfer-06443190c057/annotated-query.h5ad
- Annotated H5AD (unmatched): out/reference-transfer-805a7b4d9ad6/annotated-query.h5ad
- Bar plot (SVG): out/assignment_bar.svg
- Bar plot (PNG): out/assignment_bar.png
- This report: out/report.pdf