



Cell types search

User guide for OmnibusX web tools

Introduction

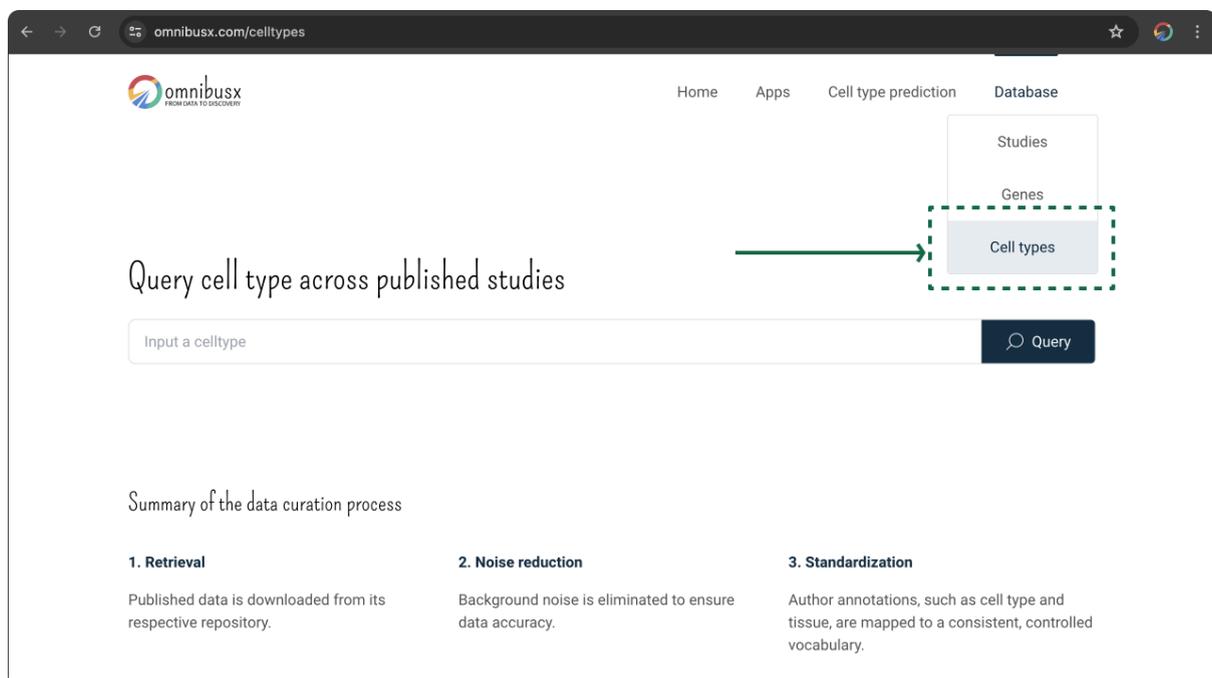
Single-cell RNA sequencing (scRNA-Seq) technologies have revolutionized the field of single-cell biology, providing unprecedented insights into the complexities of biological systems. However, the rapid growth of data generation has presented significant challenges in data management and utilization. Researchers often face difficulties in accessing and integrating vast datasets, requiring extensive computational resources and coding effort.

To address these challenges, we have developed a comprehensive database with advanced computational tools that efficiently index massive datasets, enabling swift access to author annotations and detailed cell expression profiles. Our user-friendly interface allows researchers to quickly retrieve cell type-specific markers and characteristics, significantly reducing the time required for data processing.

The Cell Type Search tool, powered by our extensive database, helps identify cell type-specific markers and characteristics across the whole database. This guide will help you fully leverage the capabilities of the Cell Type Search tool to enhance your research outcomes.

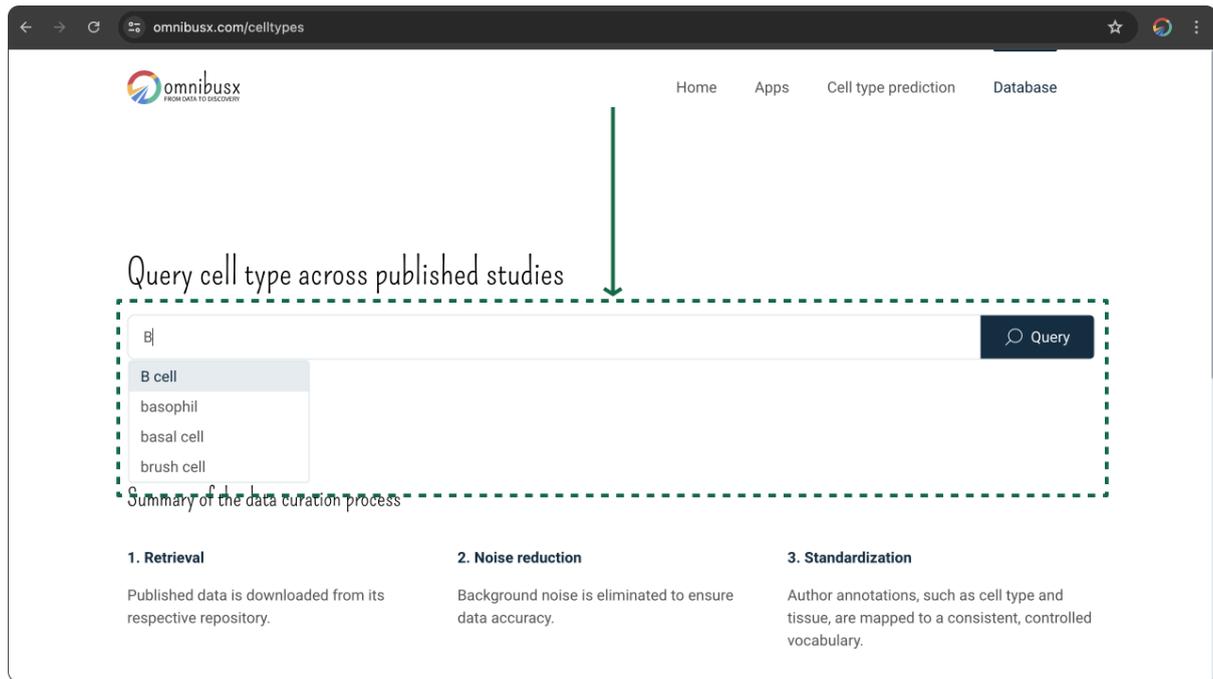
Cell types search

You can access the search tool directly at <https://omnibusx.com/celltypes>.



1. Queries

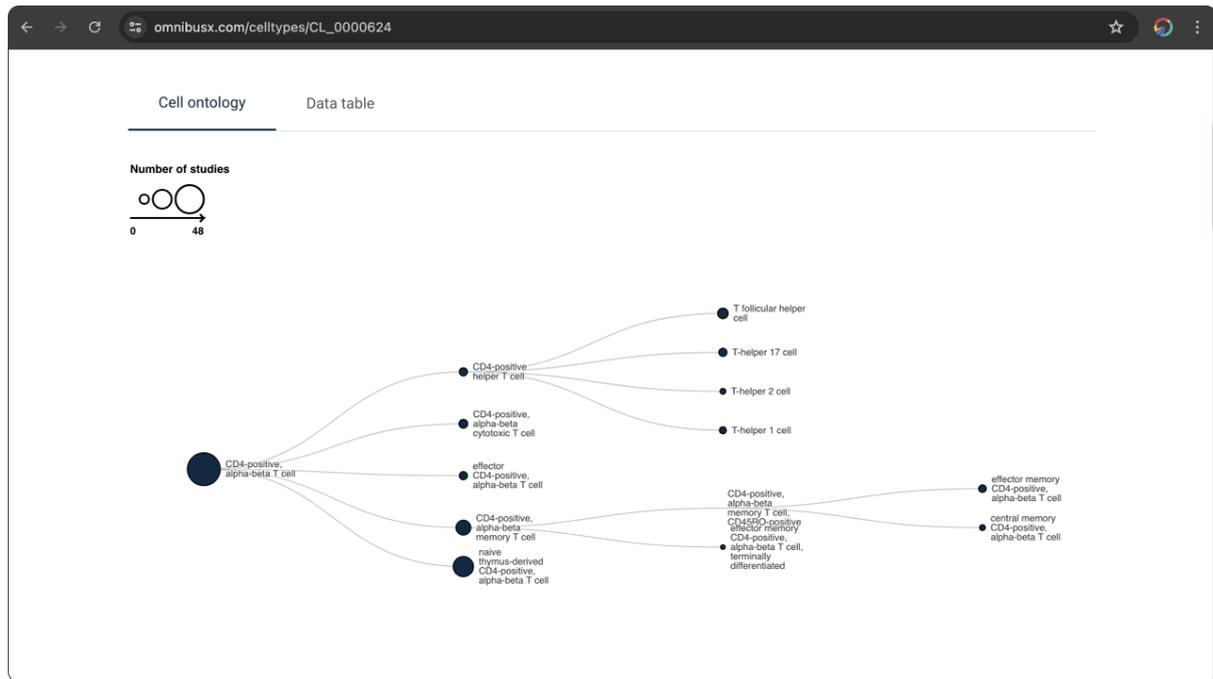
You can begin by entering the target cell type name into the input box on the **Cell type search** page. As you type, OmnibusX will dynamically suggest related cell type names, allowing you to select the correct one directly from the dropdown menu.



2. Explore

2.1. Cell type lineage

All available subtypes of the queried cell types from the database are retrieved, illustrating their relationships using Cell Ontology as a sub-ontology. This visualization provides insights into the lineage and hierarchy of cell types.



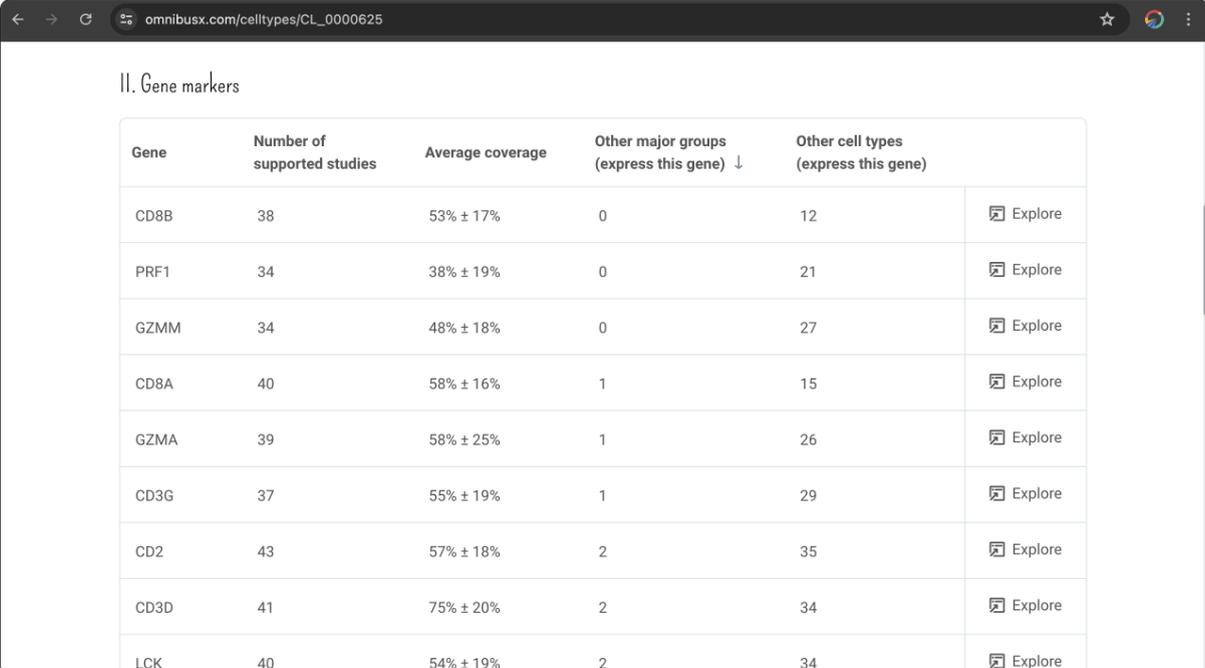
From the result table, you can access a list of studies that contain each cell subtype by clicking on the **Explore** button associated with each subtype. By clicking on a cell type ID in the table, you can trigger a detailed query for information specific to that cell type.

ID	Name	Number of studies ↑	
CL_0000624	CD4-positive, alpha-beta T cell	48	Explore
CL_0000895	naive thymus-derived CD4-positive, alpha-beta T cell	27	Explore
CL_0000897	CD4-positive, alpha-beta memory T cell	18	Explore
CL_0002038	T follicular helper cell	11	Explore
CL_0000934	CD4-positive, alpha-beta cytotoxic T cell	8	Explore
CL_0000492	CD4-positive helper T cell	7	Explore
CL_0000899	T-helper 17 cell	7	Explore
CL_0001044	effector CD4-positive, alpha-beta T cell	7	Explore

2.2. Cell type markers

The top 30 potential cell type markers, pre-calculated across the entire database, are displayed in a tabular format. This table includes:

- **Number of supporting studies:** Indicates how many studies have observed the cell type expresses the gene.
- **Average coverage:** Shows the average percentage of cells expressing the gene across supported studies.
- **Other major groups:** Number of other major cell types that also express the gene.
- **Other cell types:** Number of other cell types in the same major group with queried cell type that also express the gene.



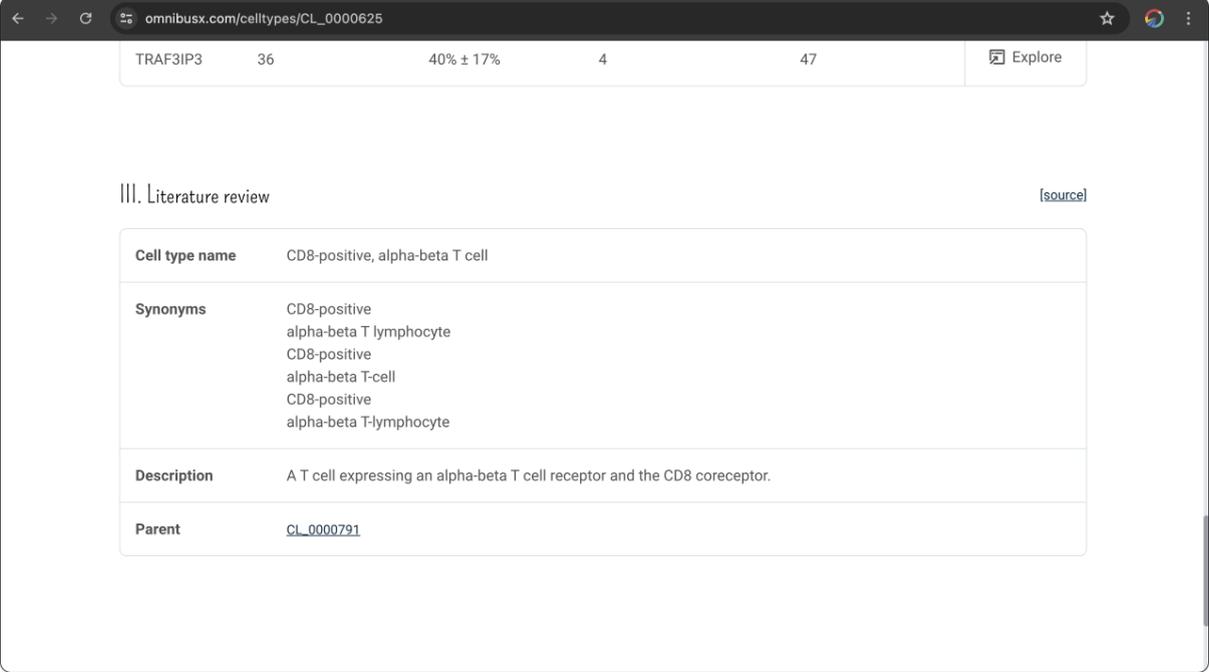
II. Gene markers

Gene	Number of supported studies	Average coverage	Other major groups (express this gene) ↓	Other cell types (express this gene)	
CD8B	38	53% ± 17%	0	12	Explore
PRF1	34	38% ± 19%	0	21	Explore
GZMM	34	48% ± 18%	0	27	Explore
CD8A	40	58% ± 16%	1	15	Explore
GZMA	39	58% ± 25%	1	26	Explore
CD3G	37	55% ± 19%	1	29	Explore
CD2	43	57% ± 18%	2	35	Explore
CD3D	41	75% ± 20%	2	34	Explore
LCK	40	54% ± 19%	2	34	Explore

A marker is considered more reliable if it is supported by a higher number of studies and has a higher average expression coverage. A marker is deemed more specific if fewer other cell types and subtypes express the gene. By clicking on the **Explore** button next to each marker, you can access the list of studies that support the expression of the marker on the queried cell type.

2.3. Literature review

Other literature information about the cell type, retrieved from Cell Ontology, is also presented to provide more detailed information on the queried cell type.



The screenshot shows a web browser window with the URL `omnibusx.com/celltypes/CL_0000625`. At the top, there is a navigation bar with the text "TRAF3IP3 36 40% ± 17% 4 47" and an "Explore" button. Below this, the section "III. Literature review" is displayed, with a "[source]" link to the right. The main content is a table with the following information:

Cell type name	CD8-positive, alpha-beta T cell
Synonyms	CD8-positive alpha-beta T lymphocyte CD8-positive alpha-beta T-cell CD8-positive alpha-beta T-lymphocyte
Description	A T cell expressing an alpha-beta T cell receptor and the CD8 coreceptor.
Parent	CL_0000791

Thank you!

We extend our heartfelt gratitude to all users of the OmnibusX Studies Search platform. Your engagement and feedback are invaluable to us and are what drive continuous improvement and innovation within our database. We are committed to supporting the scientific community by providing robust tools that facilitate groundbreaking research and discovery.

If you have suggestions, feedback, or would like to share how OmnibusX has assisted in your research endeavors, please do not hesitate to reach out to us at support@omnibus.com. Your stories inspire us, and your feedback helps us refine our tools to better serve your needs.