Supplementary materials

Section A: Query sequences used to retrieve secondary transporters based on their substrate specificities

The sample query sequence below is used to find Amino acid transporters.

(cc_scl_term:SL-0162) AND (existence:1) AND (active:true) AND (precursor:false) AND (fragment:false) AND (taxonomy_id:7742) AND (keyword:KW-0029) AND (reviewed:true)

Other types of transporters were retrieved with similar queries based on the UniProt keywords in the 3rd column of Table S1 below and further reviewed by analyzing the transporters.

No.	Substrate specificities of transporter	Keyword	Number of protein sequence retrieved
1	Amino acid	KW-0029	137
2	Sugar	KW-0762	77
3	Calcium	KW-0109	201
4	Sodium	KW-0739	295
5	Zinc	KW-0864	40
6	Neurotransmitter	KW-0532	94
7	Phosphate	KW-0592	15
8	peptide	KW-0571	22
9	Potassium	KW-0633	281
10	Copper	KW-0187	10
11	Electron transport	KW-0249	177
	Total		**1349**

Table S1: Detailed statistics of retrieved protein sequences of the secondary active transporters

As in my study, if I utilized these transporters, then they should be included in my given classes as follows:

1. Amino acids and peptides:

- Amino acids
- peptides

2. Other Secondary Active Transporters (SATs):

- Sugar
- Calcium
- Sodium
- Zinc

- Neurotransmitter
- Phosphate
- Potassium
- Copper
- Electron

Section B: solute carrier proteins data collected based on the paper title" A guide to plasma membrane solute carrier proteins"

Solute carrier protein data collection was obtained from the paper Titled "A guide to plasma membrane solute carrier proteins" Table 1 of the given paper mentions the details of the SLC proteins, and we obtained these proteins from the Transporter Classification Database (TCDB) through the given name of the protein. The following table provides details about SLC proteins.

S.No	Class	Family	Proteins at cell membrane
1	Amino acids and peptides	SLC1	SLC1A1, SLC1A2, SLC1A3, SLC1A4, SLC1A5, SLC1A6, SLC1A7
		SLC3	SLC3A1, SLC3A2; SLC7A1, SLC7A2,
		SLC7	SLC7A3, SLC7A4, SLC7A5, SLC7A7, SLC7A8, SLC7A9, SLC7A10, SLC7A11, SLC7A13
		SLC6	SLC6A1, SLC6A2, SLC6A3, SLC6A4, SLC6A5, SLC6A6, SLC6A7, SLC6A8, SLC6A9, SLC6A11, SLC6A12, SLC6A13, SLC6A14, SLC6A15, SLC6A18, SLC6A19, SLC6A20
		SLC38	SLC38A1, SLC38A2, SLC38A4, SLC38A10
		SLC43	SLC43A1, SLC43A2, SLC43A3
2	Other SATs	SLC2	SLC2A1, SLC2A2, SLC2A3, SLC2A4, SLC2A5, SLC2A7, SLC2A9, SLC2A10, SLC2A11, SLC2A12, SLC2A13, SLC2A14
		SLC5	SLC5A1, SLC5A2, SLC5A3, SLC5A4, SLC5A4, SLC5A5, SLC5A6, SLC5A7, SLC5A8, SLC5A12
		SLC12	SLC12A1, SLC12A2, SLC12A3, SLC12A4, SLC12A5, SLC12A6, SLC12A7

Table S2: Detailed statistics of retrieved protein sequences of the SLC

References

1. Pizzagalli, M.D., A. Bensimon, and G. Superti-Furga, A guide to plasma membrane solute carrier proteins. The FEBS journal, 2021. 288(9): p. 2784-2835.