

Supplementary Material

1 SUPPLEMENTARY TABLES AND FIGURES

Due to the limitation of article length, some experimental results are presented below. Table. S1 and Table. S2 represent the statistical information of data sets A and B, respectively. Based on the same experimental data set (Dataset A: *S.cerevisiae*), Table. S3, Table. S4 and Table. S5 indicate the performance differences between similarity indices, the effect of the number of similarity-inferred edges k and that of the parameter λ , respectively.

1.1 Tables

Table S1. Statistics of Dataset A.

Namespaces	<i>S.cerevisiae</i>		<i>M.musculus</i>	
	proteins	interactions	proteins	interactions
molecular function	1147	20013	715	1855
biological process	3277	54983	1046	2729
cellular component	4497	74422	1406	3614

Table S2. Statistics of Dataset B.

MIPS Functional Category	CYGD	MfunGD
01 METABOLISM	942	2662
02 ENERGY	151	603
04 STORAGE PROTEIN	0	0
10 CELL CYCLE AND DNA PROCESSING	1010	1113
11 TRANSCRIPTION	1078	2119
12 PROTEIN SYNTHESIS	480	490
14 PROTEIN FATE	1155	2484
16 PROTEIN WITH BINDING FUNCTION OR COFACTOR REQUIREMENT	1049	8369
18 REGULATION OF METABOLISM AND PROTEIN FUNCTION	249	1112
20 CELLULAR TRANSPORT, TRANSPORT FACILITIES AND TRANSPORT ROUTES	1042	2407
30 CELLULAR COMMUNICATION/SIGNAL TRANSDUCTION MECHANISM	234	4061
32 CELL RESCUE, DEFENSE AND VIRULENCE	554	769
34 INTERACTION WITH THE ENVIRONMENT	463	1486
36 SYSTEMIC INTERACTION WITH THE ENVIRONMENT	0	2073
38 TRANSPOSABLE ELEMENTS, VIRAL AND PLASMID PROTEINS	120	11
40 CELL FATE	273	1312
41 DEVELOPMENT (Systemic)	69	1042
42 BIOGENESIS OF CELLULAR COMPONENTS	863	979
43 CELL TYPE DIFFERENTIATION	452	370
45 TISSUE DIFFERENTIATION	0	426
47 ORGAN DIFFERENTIATION	0	559
70 SUBCELLULAR LOCALIZATION	0	9739
73 CELL TYPE LOCALIZATION	0	273
75 TISSUE LOCALIZATION	0	366
77 ORGAN LOCALIZATION	0	619

Table S3. Comparison of performance differences between similarity indices (Dataset A: *S.cerevisiae*).

Indices	molecular function		biological process		cellular component	
	1st	2nd	1st	2nd	1st	2nd
Origin	1.083	0.136	0.587	0.190	0.923	0.408
CN	0.493	0.163	0.370	0.136	0.528	0.266
Jaccard	0.885	0.176	0.493	0.163	0.982	0.408
FS	1.041	0.149	0.613	0.220	1.003	0.449
CN+	0.887	0.191	0.492	0.205	0.818	0.389
Jaccard+	1.043	0.203	0.563	0.187	1.128	0.429
FS+	1.222	0.176	0.639	0.235	1.086	0.493
Katz	0.923	0.169	0.471	0.192	0.881	0.351
RWR	0.961	0.176	0.563	0.176	0.961	0.408
Katz+	1.128	0.193	0.570	0.217	0.924	0.370
RWR+	1.273	0.190	0.613	0.220	1.000	0.446

Table S4. The effect of the number of similarity-inferred edges k (Dataset A: *S.cerevisiae*).

Indices	molecular function		biological process		cellular component	
	1st	2nd	1st	2nd	1st	2nd
Origin	1.083	0.136	0.587	0.190	0.923	0.408
BLAST 1	0.923	0.113	0.471	0.087	0.563	0.177
BLAST 5	1.128	0.123	0.515	0.120	0.754	0.297
BLAST 10	1.147	0.138	0.493	0.139	0.724	0.289
BLAST 15	1.040	0.122	0.447	0.150	0.696	0.282
BLAST+1	1.439	0.219	0.689	0.190	1.010	0.429
BLAST+5	1.703	0.250	0.818	0.239	1.174	0.493
BLAST+10	1.630	0.265	0.786	0.206	1.225	0.467
BLAST+15	1.615	0.239	0.754	0.224	1.130	0.449
FS 10	0.924	0.159	0.495	0.196	0.885	0.370
FS 30	1.041	0.146	0.613	0.220	1.003	0.449
FS 50	1.010	0.161	0.587	0.213	1.040	0.425
FS 100	0.963	0.152	0.563	0.207	0.981	0.429
FS+10	1.130	0.155	0.580	0.204	1.035	0.437
FS+30	1.222	0.176	0.639	0.235	1.086	0.493
FS+50	1.243	0.167	0.622	0.220	1.031	0.472
FS+100	1.235	0.161	0.610	0.232	1.042	0.440
RWR 10	0.639	0.126	0.374	0.116	0.657	0.356
RWR 30	0.961	0.176	0.563	0.176	0.961	0.408
RWR 50	0.923	0.185	0.519	0.139	0.875	0.380
RWR 100	0.864	0.173	0.470	0.151	0.827	0.357
RWR+10	1.033	0.145	0.538	0.176	0.852	0.415
RWR+30	1.273	0.190	0.613	0.220	1.000	0.446
RWR+50	1.222	0.205	0.587	0.192	0.967	0.420
RWR+100	1.150	0.176	0.552	0.216	0.910	0.461

Table S5. The effect of the parameter λ (Dataset A: *S.cerevisiae*).

Indices	molecular function		biological process		cellular component	
	1st	2nd	1st	2nd	1st	2nd
Origin	1.083	0.136	0.587	0.190	0.923	0.408
BLAST+0.1	1.273	0.178	0.617	0.195	0.873	0.378
BLAST+0.3	1.513	0.226	0.692	0.210	1.053	0.445
BLAST+0.5	1.630	0.267	0.781	0.223	1.133	0.407
BLAST+0.7	1.703	0.250	0.818	0.239	1.174	0.493
BLAST+0.9	1.381	0.197	0.648	0.201	0.983	0.429
FS+0.1	1.053	0.143	0.609	0.220	1.037	0.438
FS+0.3	1.133	0.161	0.641	0.239	1.093	0.417
FS+0.5	1.174	0.196	0.673	0.261	0.995	0.468
FS+0.7	1.222	0.176	0.639	0.235	1.086	0.493
FS+0.9	1.103	0.150	0.597	0.209	0.987	0.438
RWR+0.1	1.013	0.186	0.562	0.178	0.923	0.415
RWR+0.3	1.090	0.210	0.589	0.202	0.955	0.409
RWR+0.5	1.207	0.202	0.627	0.245	0.943	0.431
RWR+0.7	1.273	0.190	0.673	0.220	1.000	0.446
RWR+0.9	1.123	0.151	0.567	0.192	0.978	0.390