Supplementary Material (ESI) for Molecular BioSystems

Supplementary Material

Resilience of protein-protein interaction networks as determined by their large-scale topological features

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1 – Dynamic Entropy

As following, we present the 50 proteins with the highest scores of dynamic entropy for all considered databases. More specifically, we took into account two databases for each species:

1. *Saccharomyces cerevisiae*: the database of the Center for Cancer Systems Biology (CCSB) and the database based on Ito-core and Uetz-screens (Sce-Union).

2. *Caenorhabditis elegans*: the CCSB data (Cel-Wi) from Vital Lab 2007 and Biogrid version 3.0.65 (Cel-BG).

3. *Drosophila melanogaster*: the database from the Biogrid version 3.0.65 (Dme-BG) and the data from the Drosophila Interaction Database (Dme-FI).

4. *Homo sapiens*: the database from the Biogrid version 3.0.65 (Hsa-BG) and the Human Protein Reference Database release 9 (Has-HPRD).

1.1 - *Saccharomyces cerevisiae*

CCSB

Rank	Protein	Hd
1	YLR291C	0.183
2	YLR423C	0.112
3	YIR038C	0.095
4	YBR261C	0.076
5	YDR510W	0.069
6	YDR479C	0.063
7	YDR100W	0.047
8	YML051W	0.047
9	YPL094C	0.043
10	YPL049C	0.041
11	YPL070W	0.041
12	YAR027W	0.037
13	YDL100C	0.033
14	YNL189W	0.033
15	YDR448W	0.031
16	YCR106W	0.029
17	YKR034W	0.025
18	YIR033W	0.023
19	YML029W	0.022
20	YHR113W	0.020
21	YCR086W	0.018
22	YER125W	0.018
23	YCL028W	0.016
24	YKL103C	0.016
25	YPL004C	0.016
26	YGL153W	0.014
27	YJL019W	0.014
28	YOR284W	0.014
29	YPL031C	0.014
30	YDL239C	0.013
31	YDR480W	0.013
32	YJL112W	0.013
33	YNL044W	0.013
34	YBR233W	0.011
35	YGR120C	0.011
36	YJL058C	0.011
37	YKR048C	0.011
38	YLR424W	0.011
39	YLR438CA	0.011
40	YNL229C	0.011
41	YOL034W	0.011
42	YGL181W	0.010
43	YKL142W	0.010
44	YLR098C	0.010
45	YMR071C	0.010
46	YMR095C	0.010
47	YNL288W	0.010
48	YOR380W	0.010
49	YPR113W	0.010
50	YAL032C	0.008

Sce-Union

Rank	Protein	Hd
1	YLR291C	0.114
2	YNL189W	0.102
3	YLR423C	0.100
4	YIR038C	0.056
5	YDR510W	0.048
6	YBR261C	0.045
7	YDR479C	0.038
8	YDR100W	0.029
9	YDL100C	0.028
10	YML051W	0.028
11	YPL070W	0.027
12	YPL049C	0.025
13	YPL094C	0.025
14	YJR091C	0.024
15	YAR027W	0.022
16	YDL239C	0.022
17	YDR448W	0.021
18	YML064C	0.018
19	YCR086W	0.017
20	YCR106W	0.017
21	YHR114W	0.017
22	YGL153W	0.016
23	YGR120C	0.016
24	YKL103C	0.015
25	YKR034W	0.015
26	YMR047C	0.015
27	YIR033W	0.014
28	YER081W	0.013
29	YHR113W	0.013
30	YML029W	0.013
31	YOL082W	0.012
32	YER125W	0.011
33	YOR047C	0.011
34	YOR284W	0.011
35	YCL028W	0.010
36	YDR480W	0.010
37	YJL058C	0.010
38	YKR048C	0.010
39	YNL044W	0.010
40	YPL004C	0.010
41	YGL181W	0.009
42	YJL019W	0.009
43	YJL030W	0.009
44	YJL112W	0.009
45	YKL142W	0.009
46	YLR424W	0.009
47	YOR355W	0.009
48	YPL031C	0.009
49	YGL122C	0.008
50	YIL144W	0.008

1.2 - *Caenorhabditis elegans*

Cel-Wi

Rank	Protein	Hd
1	R05F9.10	0.179
2	Y40B10A.2	0.092
3	R02F2.5	0.082
4	Y69H2.3	0.082
5	T11B7.1	0.080
6	C06A5.9	0.069
7	K09B11.9	0.051
8	Y65B4BR.4	0.051
9	ZK121.2	0.051
10	F52E1.7	0.045
11	ZK849.2	0.045
12	ZK1053.5	0.037
13	W09C2.1	0.035
14	W05H7.4	0.033
15	DH11.4	0.031
16	C06G1.5	0.027
17	M04G12.1	0.027
18	C50F4.1	0.025
19	F01G10.2	0.025
20	K12C11.2	0.023
21	W10C8.2	0.023
22	C36C9.1	0.021
23	F44G3.9	0.021
24	F46A9.5	0.020
25	T21G5.5	0.020
26	ZK858.4	0.020
27	C18G1.2	0.018
28	ZK1055.7	0.018
29	F32B4.4	0.016
30	Y54E2A.3	0.016
31	C18H9.7	0.014
32	C49A1.4	0.014
33	C52B11.2	0.014
34	F37B1.4	0.014
35	T11B7.4	0.014
36	Y37D8A.21	0.014
37	Y49E10.14	0.014
38	Y53H1A.1	0.014
39	F54G8.4	0.013
40	Y55F3C.6	0.013
41	C25A1.4	0.011
42	C38D9.1	0.011
43	C44B9.2	0.011
44	F17E9.5	0.011
45	H06I04.1	0.011
46	R05F9.1	0.011
47	W02D3.9	0.011
48	Y59A8B.7	0.011
49	F14F3.2	0.010
50	F15C11.1	0.010

Cel-BG

Rank	Protein	Hd
1	C32F10.2	0.367
2	C05D11.4	0.120
3	W07B3.2	0.105
4	C54D1.6	0.103
5	Y55D5A.5	0.094
6	F58A3.2	0.082
7	ZK792.6	0.074
8	C14F5.5	0.060
9	ZK1067.1	0.056
10	T17H7.4	0.055
11	C07H6.6	0.046
12	T11B7.4	0.045
13	T04H1.2	0.044
14	C32D5.2	0.040
15	K09B11.9	0.040
16	F02A9.6	0.038
17	T05C12.6	0.038
18	C49A1.4	0.036
19	W04D2.1	0.033
20	C38D4.6	0.033
21	Y41C4A.14	0.031
22	F44G3.9	0.030
23	T28F12.3	0.029
24	F35H12.3	0.025
25	F43C1.2	0.024
26	W02G9.3	0.021
27	ZK849.1	0.021
28	R09B5.5	0.020
29	C03A7.4	0.018
30	F14F3.1	0.018
31	M03A1.1	0.018
32	B0024.14	0.017
33	W09H1.6	0.017
34	R05F9.10	0.014
35	D1007.6	0.013
36	F47G6.1	0.013
37	K01G5.1	0.013
38	R12B2.1	0.013
39	T01D1.6	0.013
40	T26A5.9	0.012
41	W06F12.1	0.011
42	F32E10.4	0.011
43	F38A6.1	0.011
44	F44B9.6	0.011
45	Y39B6A.1	0.011
46	C18H9.7	0.010
47	F47D12.4	0.010
48	Y79H2A.11	0.010
49	R11E3.6	0.009
50	F08G2.5	0.009

1.3 - *Drosophila melanogaster*

Dme-BG

Rank	Protein	Hd
1	Dmel_CG12470	0.026
2	Dmel_CG9986	0.020
3	Dmel_CG33336	0.017
4	Dmel_CG9375	0.016
5	Dmel_CG11164	0.015
6	Dmel_CG3936	0.015
7	Dmel_CG3052	0.014
8	Dmel_CG17666	0.014
9	Dmel_CG8942	0.013
10	Dmel_CG15631	0.012
11	Dmel_CG4394	0.012
12	Dmel_CG3938	0.011
13	Dmel_CG13458	0.011
14	Dmel_CG4303	0.011
15	Dmel_CG15218	0.010
16	Dmel_CG8128	0.010
17	Dmel_CG11525	0.010
18	Dmel_CG10263	0.010
19	Dmel_CG2865	0.010
20	Dmel_CG5072	0.010
21	Dmel_CG13030	0.010
22	Dmel_CG4617	0.010
23	Dmel_CG1391	0.009
24	Dmel_CG14534	0.009
25	Dmel_CG6779	0.009
26	Dmel_CG7386	0.009
27	Dmel_CG10079	0.008
28	Dmel_CG2199	0.008
29	Dmel_CG17050	0.008
30	Dmel_CG3510	0.008
31	Dmel_CG3978	0.008
32	Dmel_CG7570	0.008
33	Dmel_CG1071	0.008
34	Dmel_CG11138	0.008
35	Dmel_CG11579	0.008
36	Dmel_CG6459	0.008
37	Dmel_CG10388	0.008
38	Dmel_CG33980	0.008
39	Dmel_CG5792	0.008
40	Dmel_CG10327	0.008
41	Dmel_CG9083	0.008
42	Dmel_CG14425	0.008
43	Dmel_CG15109	0.007
44	Dmel_CG2948	0.007
45	Dmel_CG4818	0.007
46	Dmel_CG5460	0.007
47	Dmel_CG3929	0.007
48	Dmel_CG10032	0.007
49	Dmel_CG3114	0.007
50	Dmel_CG11327	0.007

Dme-FI

Rank	Protein	Hd
1	FBgn0030668	0.088753
2	FBgn0016131	0.078486
3	FBgn0025637	0.073427
4	FBgn0004107	0.070917
5	FBgn0031768	0.068421
6	FBgn0039858	0.058581
7	FBgn0037345	0.056159
8	FBgn0026371	0.051366
9	FBgn0039395	0.051366
10	FBgn0025674	0.048996
11	FBgn0259168	0.045475
12	FBgn0003479	0.04431
13	FBgn0259220	0.043151
14	FBgn0035640	0.038567
15	FBgn0010316	0.037434
16	FBgn0000063	0.036307
17	FBgn0013762	0.036307
18	FBgn0026176	0.036307
19	FBgn0024371	0.035186
20	FBgn0036257	0.035186
21	FBgn0003302	0.034071
22	FBgn0010379	0.031859
23	FBgn0028509	0.031859
24	FBgn0031129	0.029674
25	FBgn0033879	0.029674
26	FBgn0250791	0.029674
27	FBgn0003114	0.028591
28	FBgn0015624	0.028591
29	FBgn0032192	0.027515
30	FBgn0042102	0.027515
31	FBgn0010317	0.026446
32	FBgn0013435	0.026446
33	FBgn0036977	0.026446
34	FBgn0010235	0.025385
35	FBgn0005683	0.024332
36	FBgn0022936	0.024332
37	FBgn0029522	0.024332
38	FBgn0032956	0.024332
39	FBgn0000166	0.023286
40	FBgn0011648	0.023286
41	FBgn0031997	0.023286
42	FBgn0032196	0.023286
43	FBgn0000546	0.022249
44	FBgn0014001	0.022249
45	FBgn0025334	0.022249
46	FBgn0040290	0.022249
47	FBgn0032906	0.02122
48	FBgn0010602	0.0202
49	FBgn0035641	0.0202
50	FBgn0038213	0.0202

1.4 - *Homo sapiens*

Hsa-BG

Rank	Protein	Hd
1	ETG7316	0.041017
2	ETG7157	0.034517
3	ETG1956	0.019722
4	ETG56257	0.01958
5	ETG2885	0.018449
6	ETG672	0.018168
7	ETG7186	0.016079
8	RP4-811H24.2	0.015803
9	ETG7046	0.015665
10	ETG8517	0.015116
11	ETG11007	0.01457
12	RP1-130E4.1	0.014434
13	RP11-383C12.1	0.013352
14	ETG6714	0.012415
15	ETG10980	0.012282
16	AC002059.7	0.011752
17	ETG1499	0.011752
18	RP1-85F18.1	0.011752
19	ETG1387	0.01162
20	ETG2810	0.011488
21	ETG6622	0.010964
22	ETG7322	0.010964
23	ETG7329	0.010964
24	RP4-696P19.1	0.010573
25	ETG4089	0.010443
26	ETG5925	0.010313
27	ETG55791	0.010054
28	ETG3725	0.009797
29	RP1-66H14.1	0.009668
30	ETG3066	0.00954
31	ETG5970	0.00954
32	ETG7321	0.00954
33	ETG4609	0.009412
34	ETG7189	0.009412
35	ETG6908	0.009157
36	ETG4088	0.00903
37	ETG7323	0.008903
38	ETG9146	0.008776
39	ETG57154	0.008524
40	ETG10856	0.008398
41	ETG10971	0.008273
42	RP11-307C12.1	0.008147
43	ETG3064	0.008022
44	ETG9094	0.008022
45	ETG4087	0.007898
46	ETG5295	0.007898
47	RP11-124N14.1	0.007773
48	RP11-228B15.5	0.007773
49	ETG2908	0.007649
50	ETG51619	0.007649

Has-HPRD

Rank	Protein	Hd
1	TP53	0.029594
2	YWHAG	0.026643
3	EP300	0.02186
4	SRC	0.021736
5	CREBBP	0.0205
6	GRB2	0.019886
7	ESR1	0.019274
8	SMAD3	0.018422
9	-	0.017334
10	PRKCA	0.017334
11	CSNK2A1	0.016854
12	SMAD2	0.016614
13	EGFR	0.016017
14	MAPK1	0.015898
15	ATXN1	0.015305
16	FYN	0.015069
17	SMAD4	0.014951
18	TGFBR1	0.014951
19	AR	0.014715
20	UBQLN4	0.01448
21	PRKACA	0.014128
22	TRAF2	0.014011
23	CTNNB1	0.012965
24	RB1	0.01285
25	CASP3	0.012389
26	CCDC85B	0.012274
27	HDAC1	0.012159
28	PIK3R1	0.012159
29	YWHAB	0.011702
30	YWHAZ	0.011475
31	CDK1	0.011135
32	AKT1	0.010909
33	SHC1	0.010909
34	EWSR1	0.010796
35	JUN	0.010683
36	MAPK3	0.010683
37	CALM1	0.010459
38	RELA	0.010459
39	VIM	0.010235
40	SMAD1	0.010123
41	SMAD9	0.010123
42	ABL1	0.0099
43	PTPN11	0.0099
44	BRCA1	0.009789
45	LCK	0.009567
46	UBE2I	0.009346
47	LYN	0.009236
48	PRKCD	0.009236
49	MDFI	0.009126
50	STAT3	0.009126