

Supplemental Material for

## IAS: Interaction specific GO term associations for predicting Protein-Protein Interaction Networks

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### Comparison of Protein-pair IAS and Funsim Scores

Organism	Protein1	Function	Protein2	Function	IAS score	Funsim score
<i>5 examples of protein pairs in Yeast with High IAS and Low Funsim Score</i>						
Yeast	Q06697	Cell division control protein	Q02457	Negatively regulates telomere length.	4637.223	0.249232
	P50945	MICOS complex subunit	P40341	Mitochondrial respiratory chain complexes assembly protein	3653.253	0.204759
	Q12149	Exosome complex exonuclease	Q06629	HDA1 complex subunit	2246.893	0.198034
	P39925	Mitochondrial respiratory chain complexes assembly protein	P50087	MICOS MIC26 subunit	2237.821	0.141551
	P39001	Transcriptional regulatory protein UME6	Q08773	ISWI chromatin-remodeling complex ATPase	1868.926	0.172188
<i>5 examples of protein pairs in Yeast with Low IAS and High Funsim Score</i>						
Yeast	P36001	Probable foylpolylglutamate synthase	Q08645	Foylpolylglutamate synthase	12.31534	0.944683
	Q02785	ATP-dependent permease PDR12	P53388	Dicarboxylic amino acid permease	11.52488	0.87668
	P25383	Transposon Ty2-C Gag polyprotein	Q99303	Transposon Ty2-DR3 Gag polyprotein	9.968839	0.811535
	P25384	Transposon Ty2-C Gag-Pol polyprotein	Q99303	Transposon Ty2-DR3 Gag polyprotein	9.968688	0.811535
	P40487	Diphthamide biosynthesis protein 1	P32461	Diphthamide biosynthesis protein 2	12.47936	0.745276
<i>5 examples of protein pairs in Human with High IAS and Low Funsim Score</i>						

Human	Q9H0E7	Ubiquitin carboxyl-terminal hydrolase 44	Q9Y4P3	Transducin beta-like protein 2	1182.945	0
	Q9Y239	Nucleotide-binding oligomerization domain-containing protein 1	P49662	Caspase-4. Involved in the activation cascade of caspases responsible for apoptosis execution.	1199.867	0.232841
	Q01718	Adrenocorticotrophic hormone receptor	Q8TCY5	Melanocortin-2 receptor accessory protein	853.1906	0.229533
	P52333	Tyrosine-protein kinase JAK3	P42229	STAT5A. Signal transducer and activator of transcription 5A.	583.231	0.274066
	Q99460	26S proteasome non-ATPase regulatory subunit 1	P53992	Protein transport protein Sec24C	547.2486	0.148838
<i>5 examples of protein pairs in Human with Low IAS and High Funsim Score</i>						
Human	Q9H9D4	Zinc finger protein 408	Q96BR9	Zinc finger and BTB domain-containing protein 8A	8.786128	0.860802
	Q9H9D4	Zinc finger protein 408	Q96C00	Zinc finger and BTB domain-containing protein 9	8.789851	0.860802
	Q9NX65	Zinc finger and SCAN domain-containing protein 32	Q9NWS9	Zinc finger protein 446	11.55142	0.90328
	Q96SU4	Oxysterol-binding protein-related protein 9	Q9BXB4	Oxysterol-binding protein-related protein 11	12.97526	0.991248
	P0CG13	Chromosome transmission fidelity protein 8 homolog	Q8WVB6	Chromosome transmission fidelity protein 18 homolog	14.01976	0.90241
<i>5 examples of protein pairs in Drosophila with High IAS and Low Funsim Score</i>						
	Q01842	Ets DNA-binding protein pokkuri	P42519	Protein Star; Involved in EGF receptor signaling	1006.967	0.158275
	Q00805	Protein giant-lens. Regulates cell determination	P20350	Protein rhomboid. Acts early in embryonic development	1036.235	0.168217
	P11346	Raf homolog serine/threonine-protein kinase	P42519	Protein Star. Involved in EGF receptor signaling.	1045.979	0.139545

Drosophila				Has an early role in photoreceptor development.		
	P07713	Protein decapentaplegic. Required during oogenesis for eggshell patterning and dorsal/ventral patterning of the embryo.	P20350	Protein rhomboid. Acts early in embryonic development	832.3764	0.182522
	P18491	Protein extra-macrochaetae. Participates in sensory organ patterning	P20350	Protein rhomboid. Acts early in embryonic development	685.1987	0.175612
<i>5 examples of protein pairs in Drosophila with Low IAS and High Funsim Score</i>						
Drosophila	Q9VI93	Zinc finger protein rotund	P13360	Protein glass. Transcription factor required for gene expression specific to photoreceptor cells.	8.074299	0.756588
	P35600	Replication factor C subunit 1	Q8IRH5	Zinc finger protein CG2199	8.910923	0.747238
	Q8IRH5	Zinc finger protein CG2199	Q95V55	Forkhead box protein O	9.675376	0.653116
	P02516	Heat shock protein 23	P02518	Heat shock protein 27	10.97506	0.694021
	Q9V411	Probable nucleolar GTP-binding protein 1	Q9VGN9	Probable ribosome biogenesis protein RLP24	14.39676	0.652824
<i>5 examples of protein pairs in C. Elegans with High IAS and Low Funsim Score</i>						
C. Elegans	Q20334	Troponin I 1. Troponin I is the inhibitory subunit of troponin, the thin filament regulatory complex which confers calcium-sensitivity to muscle actomyosin ATPase activity.	Q09665	Troponin C, isoform 2	497.067	0.088341
	Q9XUN9	Troponin I 3	Q09665	Troponin C, isoform 2	497.067	0.088341
	P29355	Sex muscle abnormal protein 5	O01501	G1/S-specific cyclin-E. Essential for the control of the cell cycle at the G1/S (start) transition.	248.059	0.114085
	Q23670	Probable DNA topoisomerase 2.	Q21993	Probable prefoldin	221.9866	0.024751

		Control of topological states of DNA by transient breakage and subsequent rejoining of DNA strands.		subunit 5. Binds specifically to cytosolic chaperonin (c-CPN) and transfers target proteins to it.		
	P34547	Ubiquitin carboxyl-terminal hydrolase 46.	P34299	Glutamate receptor 1	184.6148	0.120908
<i>5 examples of protein pairs in C. Elegans with Low IAS and High Funsim Score</i>						
C. Elegans	O45521	Nuclear hormone receptor family member nhr-111	Q9TZ93	Transcription elongation factor SPT4	10.54549	0.891234
	O76828	Nuclear hormone receptor family member nhr-42	Q17905	Nuclear hormone receptor family member nhr-28	12.30861	0.899786
	O62389	Nuclear hormone receptor family member nhr-61	O45436	Nuclear hormone receptor family member nhr-4	12.30861	0.899786
	Q09528	Nuclear hormone receptor family member nhr-19	O45666	Nuclear hormone receptor family member nhr-49	12.80703	0.898184
	Q17635	Kinetochore protein ndc-80	O45406	Kinetochore-binding protein 3	25.66909	0.803771
<i>5 examples of protein pairs in Arabidopsis with High IAS and Low Funsim Score</i>						
Arabidopsis	P43254	E3 ubiquitin-protein ligase COP1	P42497	Phytochrome D	1405.465	0.25954
	O22267	Histidine kinase CK11	Q9SAZ5	Histidine-containing phosphotransfer protein 3	1001.034	0.272953
	O22267	Histidine kinase CK11	Q9ZNV8	Histidine-containing phosphotransfer protein 2	879.829	0.272953
	Q9C5U2	Histidine kinase 2	Q9C671	Phosphatidylinositol 4-kinase gamma 5	643.2171	0.179525
	P18064	Guanine nucleotide-binding protein alpha-1 subunit	Q9ZUY3	Arogenate dehydratase 3	508.0973	0.287969
<i>5 examples of protein pairs in Arabidopsis with Low IAS and High Funsim Score</i>						
Arabidopsis	P42777	G-box-binding factor 4	P42776	G-box-binding factor 3	7.323059	0.9006
	O23310	Nuclear transcription factor Y subunit B-3	Q4PSE2	Nuclear transcription factor Y subunit C-8	7.384414	0.9006
	O04027	Nuclear transcription factor Y subunit B-4	Q9SIT9	Nuclear transcription factor Y subunit B-7	7.432829	0.910229
	P48000	Homeobox protein knotted-1-like 3	P48001	Homeobox protein knotted-1-like 4	8.329465	0.956769
	Q9LDU5	Protein TIFY 11A	Q9C5K8	Protein TIFY 3B	9.510421	0.907479

<i>5 examples of protein pairs in S. Pombe with High IAS and Low Funsim Score</i>							
S. Pombe	O74977	VMS1 homolog C1827.04	O13987	Ankyrin and IPT/TIG repeat- containing protein C26H5.05	2704.054	0.0972	
	O74518	Poly(A) RNA polymerase cid12	O94687	RNA-induced transcriptional silencing complex protein tas3	1461.007	0.266294	
	O14285	DASH complex subunit spc34	P56523	Histone deacetylase clr3	1358.634	0.172559	
	Q9HGP4	Bromodomain- containing protein C631.02	P17478	60S acidic ribosomal protein P2-beta	1346.455	0.017111	
	Q9HGP4	Bromodomain- containing protein C631.02	O14049	40S ribosomal protein S8-A	1303.368	0.058298	
<i>5 examples of protein pairs in S. Pombe with Low IAS and High Funsim Score</i>							
S. Pombe	O74824	GTP-binding protein gtr1	O74544	GTP-binding protein gtr2	6.865696	0.86719	
	Q09702	Negative regulator of differentiation 1	Q10277	Multicopy suppressor of sporulation protein msa1	14.93026	0.876174	
	O74954	Transcription factor cbf11	O59744	Uncharacterized transcriptional regulatory protein C530.08	18.95079	0.839583	
	O43019	Putative transcription factor sre2	Q10424	Transcription factor zip1	19.93215	0.853209	
	Q9UTH8	Zinc finger protein sfp1	O94720	GATA zinc finger domain-containing protein C1393.08	21.34255	0.839883	