

**Supplementary Table 1.** Baseline demographic and cognitive characteristics of the participants.

<b>Characteristics</b>	<b>MCI (n=6)</b>
Age, mean $\pm$ SD, y	70.16 $\pm$ 3.43
Sex, No. (%)	
Men	3 (50 %)
Women	3 (50 %)
Education level, No. (%)	
Less than six years	2 (33%)
More than six years	4 (66%)
Occupation, No. (%)	
Employee	2 (33 %)
Unemployed	4 (66 %)
Alcohol intake, No. (%)	
No	4 (66 %)
Current	2 (33 %)
Smoking status, No. (%)	
No	3 (50 %)
Past smoking	3 (50 %)
Cognitive status, mean $\pm$ SD	
MoCA-K	19.00 $\pm$ 3.10

MoCA-K, Korean version of Montreal Cognitive Assessment.

**Supplementary Table 2.** Ingredients and content of herbal medicines

Herbal medicine	Gamiguibi-tang		Yukmijihwang-tang		Banhasasim-tang	
	Ingredient name	Amount (g)	Ingredient name	Amount (g)	Ingredient name	Amount (g)
Main ingredient	<i>Panax ginseng</i> C.A. Meyer	1.00	<i>Rehmannia glutinosa</i> Liboschitz	2.00	<i>Pinellia ternata</i> Breitenbach	2.50
	<i>Atractylodes japonica</i> Koidzumi	1.00	<i>Dioscorea batatas</i> Decaisne	1.00	<i>Scutellaria baicalensis</i> Georgi	1.88
	<i>Poria cocos</i> Wolf	1.00	<i>Cornus officinalis</i> Siebold	1.00	<i>Panax ginseng</i> C.A. Meyer	1.88
	<i>Dimocarpus longan</i> Loureiro	1.00	<i>Paeonia suffruticosa</i> Andrew	1.00	<i>Glycyrrhiza uralensis</i> Fischer	1.88
	<i>Astragalus membranaceus</i> Bunge	1.00	<i>Poria cocos</i> Wolf	1.00	<i>Zingiber officinale</i> Roscoe	1.25
	<i>Angelica gigas</i> Nakai	0.67	<i>Alisma orientale</i> Juzepzuk	1.00	<i>Coptis japonica</i> Makino	0.63
	<i>Polygala tenuifolia</i> Willdenow	0.67			<i>Zingiber officinale</i> Roscoe	0.50
	<i>Bupleurum falcatum</i> Linné	1.00			<i>Zizyphus jujuba</i> Miller	0.67
	<i>Gardenia jasminoides</i> Ellis	0.67				
	<i>Glycyrrhiza uralensis</i> Fischer	0.33				
<i>Aucklandia lappa</i> Decne.	0.33					

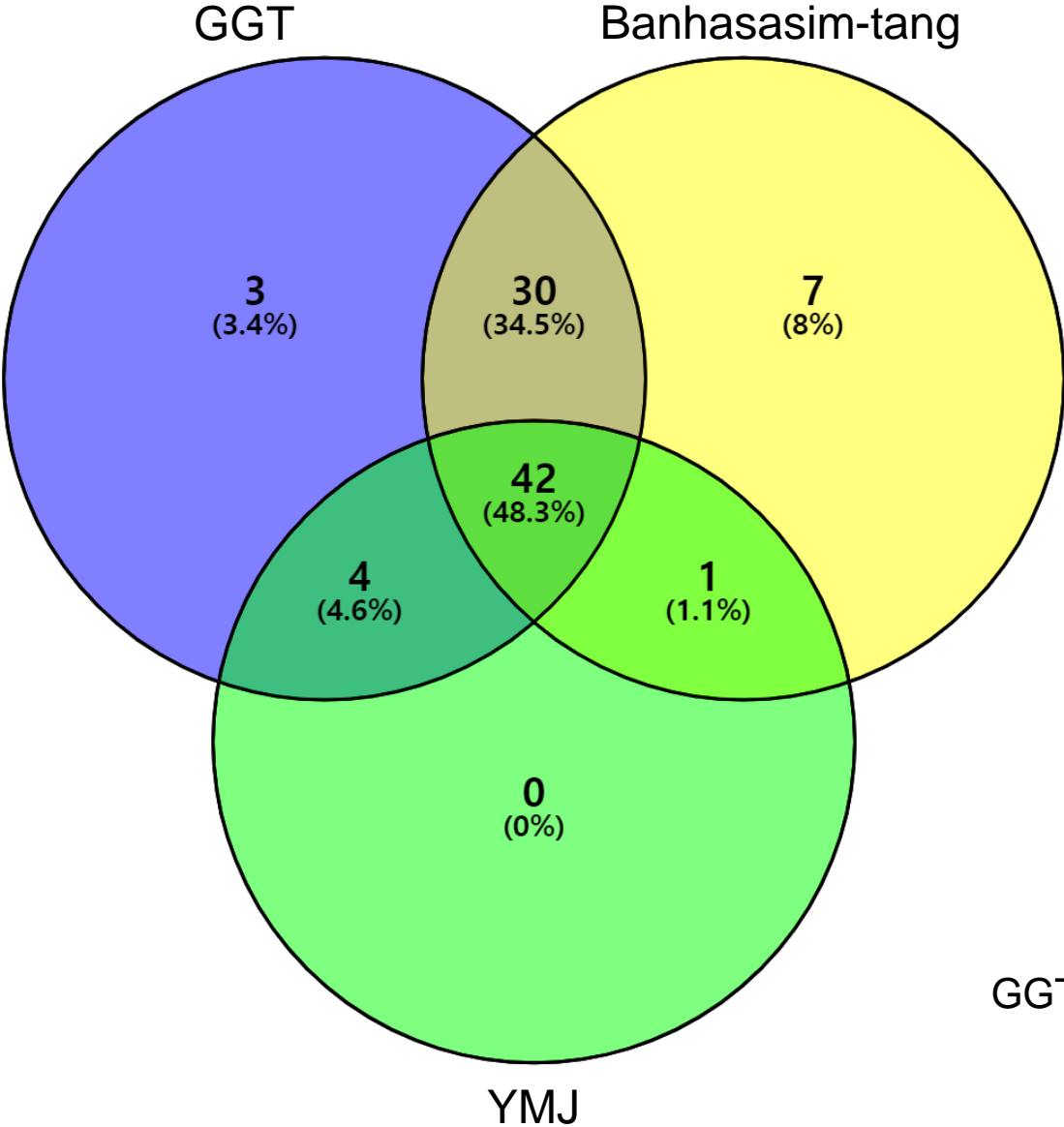
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<i>Zizyphus jujuba</i> Miller var. <i>inermis</i> Rehder	0.67		
<i>Zingiber officinale</i> Roscoe (dried)	0.33		
<i>Zizyphus jujuba</i> Miller var. <i>spinosa</i> Hu ex H. F. Chou	1.00		
<i>Paeonia suffruticosa</i> Andrew	0.67		
<b>Total</b>	11.34	7.00	11.19

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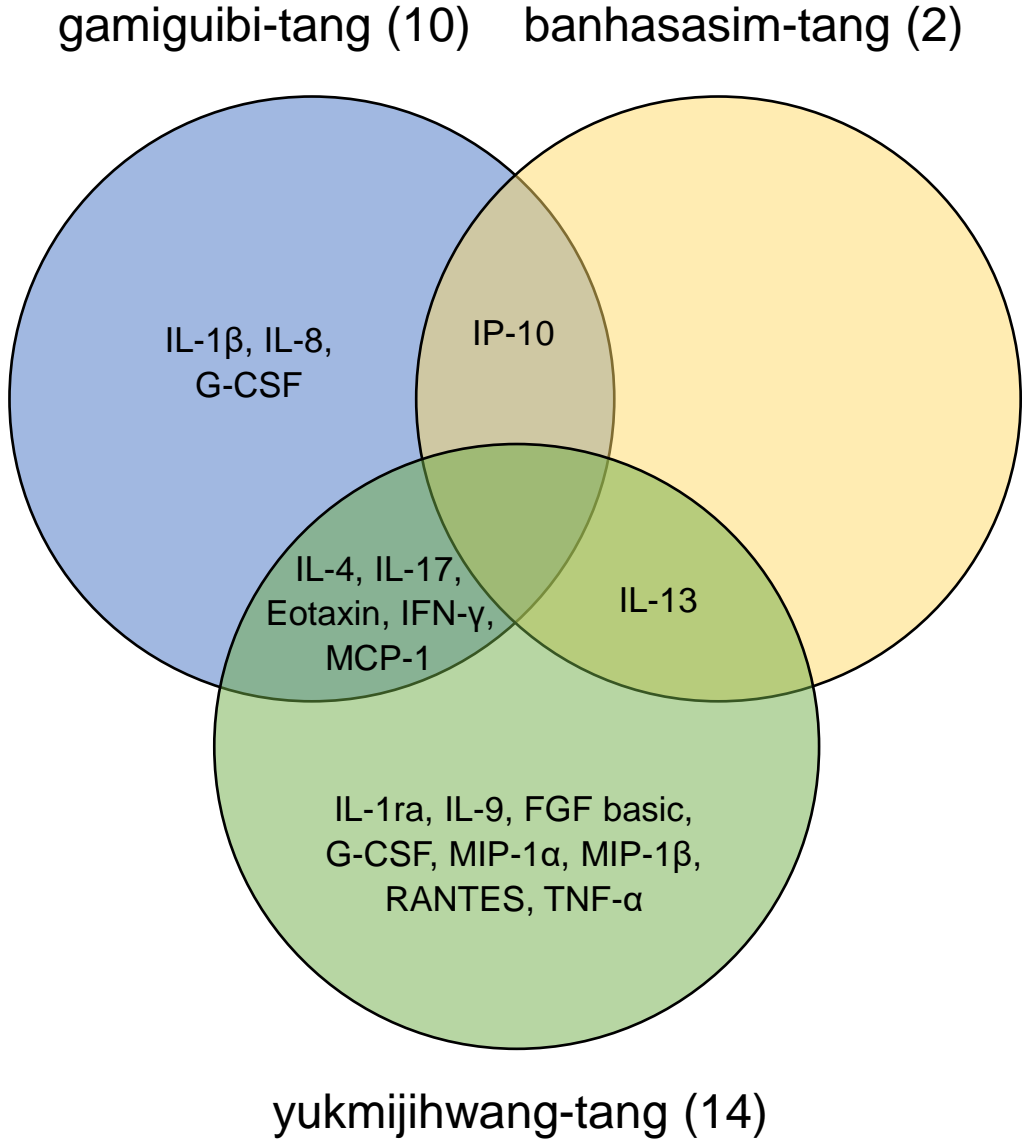


**Supplementary Figure 1.** Distribution of common and unique targets across the three formulas.



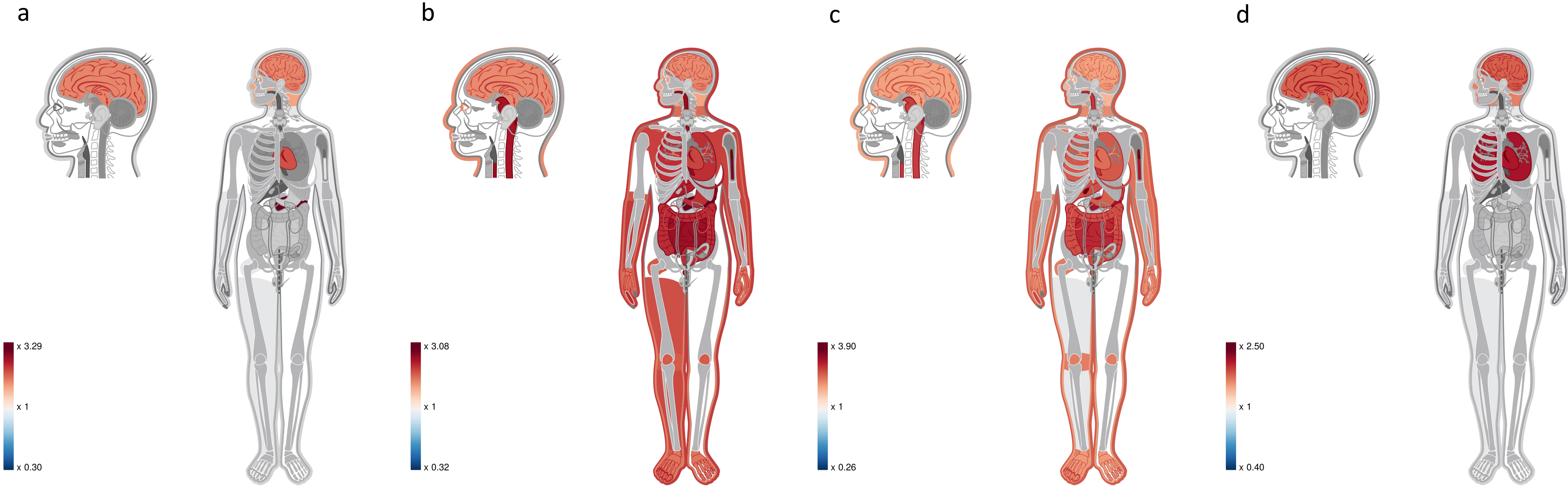
GGT, Gamiguibi-tang; YMJ, Yukmijihwang-tang

**Supplementary Figure 2.** Herbal formula-induced cytokine alterations in patients with MCI, assessed using a human cytokine multiplex assay.



MCI, mild cognitive impairment; IL, interleukin; G-CSF, granulocyte-colony-stimulating factor; IP, inducible protein; IFN, interferon; MCP, monocyte chemoattractant protein; FGF, fibroblast growth factor; MIP, macrophage inflammatory protein; RANTES, regulated on activation normal T-cell expressed and presumably secreted; TNF, tumor necrosis factor

**Supplementary Figure 3.** Organ enrichment (red) and depletion (blue) of (a) common, and individual [(b) GGT, (c) Banhasasim-tang, and (d) YMJ], targets of the three formulas.



GGT, Gamiguibi-tang; YMJ, Yukmijihwang-tang

## Supplementary 1

### <GGT target list>

#	Symbol	Description (Query "mild cognitive impairment")	Type	Score	-Log10(p)	Average Disease Causing Likelihood
1	MAPT	Microtubule Associated Protein Tau	Protein	19.5	4.06	14.1
2	DGUOK	Deoxyguanosine Kinase	Protein	11.98	3.64	52.5
3	BCHE	Butyrylcholinesterase	Protein	11.7	3.59	18
4	ACHE	Acetylcholinesterase (Cartwright Blood Group)	Protein	9.93	3.14	43.9
5	IL1B	Interleukin 1 Beta	Protein	9.64	3.11	81.8
6	ADRA2B	Adrenoceptor Alpha 2B	Protein	8.77	2.96	49.7
7	ABCA7	ATP Binding Cassette Subfamily A Member 7	Protein	8.36	2.94	2
8	DLG4	Discs Large MAGUK Scaffold Protein 4	Protein	7.99	2.91	82.8
9	SLC6A3	Solute Carrier Family 6 Member 3	Protein	7.28	2.89	84.9
10	INS	Insulin	Protein	6.89	2.87	74.5
11	TNF	Tumor Necrosis Factor	Protein	6.53	2.82	70.4
12	NOS3	Nitric Oxide Synthase 3	Protein	5.56	2.74	58.5
13	MTHFR	Methylenetetrahydrofolate Reductase	Protein	4.92	2.71	22.2
14	COMT	Catechol-O-Methyltransferase	Protein	4.59	2.68	11.8
15	ACE	Angiotensin I Converting Enzyme	Protein	4.59	2.68	15.8
16	TP53	Tumor Protein P53	Protein	4.15	2.65	72.8
17	HMOX1	Heme Oxygenase 1	Protein	3.9	2.62	31.9
18	CHRNA7	Cholinergic Receptor Nicotinic Alpha 7 Subunit	Protein	3.84	2.61	58.3
19	BCL2	BCL2 Apoptosis Regulator	Protein	3.64	2.57	48.6
20	DNMT3A	DNA Methyltransferase 3 Alpha	Protein	3.64	2.57	86.7
21	DRD2	Dopamine Receptor D2	Protein	3.62	2.56	63.3
22	HTR2A	5-Hydroxytryptamine Receptor 2A	Protein	3.5	2.54	62.1
23	MAOB	Monoamine Oxidase B	Protein	3.42	2.52	84.5
24	ESR1	Estrogen Receptor 1	Protein	3.38	2.52	68.5
25	BLVRA	Biliverdin Reductase A	Protein	3.19	2.47	39.8
26	VDR	Vitamin D Receptor	Protein	3.12	2.44	64.2
27	ADORA2A	Adenosine A2a Receptor	Protein	3.08	2.44	64.8
28	DRD3	Dopamine Receptor D3	Protein	3.08	2.44	60.2
29	HMGCR	3-Hydroxy-3-Methylglutaryl-CoA Reductase	Protein	2.97	2.4	83.1
30	ITPR1	Inositol 1,4,5-Trisphosphate Receptor Type 1	Protein	2.91	2.4	73.5
31	AIFM1	Apoptosis Inducing Factor Mitochondria Associated 1	Protein	2.91	2.4	72.5



32	MPO	Myeloperoxidase	Protein	2.91	2.4	33.8
33	PIK3R1	Phosphoinositide-3-Kinase Regulatory Subunit 1	Protein	2.91	2.4	54.4
34	SCN4A	Sodium Voltage-Gated Channel Alpha Subunit 4	Protein	2.91	2.4	43.3
35	ABCB1	ATP Binding Cassette Subfamily B Member 1	Protein	2.49	2.22	58
36	DRD5	Dopamine Receptor D5	Protein	2.49	2.22	34.6
37	SIGMAR1	Sigma Non-Opioid Intracellular Receptor 1	Protein	2.49	2.22	36.3
38	RAB7A	RAB7A, Member RAS Oncogene Family	Protein	2.49	2.22	82
39	PTGS2	Prostaglandin-Endoperoxide Synthase 2	Protein	2.47	2.19	66.5
40	ABCA1	ATP Binding Cassette Subfamily A Member 1	Protein	2.47	2.19	51.7
41	ALB	Albumin	Protein	2.47	2.19	82.3
42	ESR2	Estrogen Receptor 2	Protein	2.47	2.19	54.1
43	SLC6A4	Solute Carrier Family 6 Member 4	Protein	2.47	2.19	73
44	GSTO1	Glutathione S-Transferase Omega 1	Protein	2.47	2.19	17.7
45	GRIN2A	Glutamate Ionotropic Receptor NMDA Type Subunit 2A	Protein	2.35	2.16	78.3
46	OPRM1	Opioid Receptor Mu 1	Protein	2.35	2.16	7.8
47	GLUL	Glutamate-Ammonia Ligase	Protein	2.35	2.16	87.5
48	ALDH2	Aldehyde Dehydrogenase 2 Family Member	Protein	2.35	2.16	51.1
49	MMP9	Matrix Metalloproteinase 9	Protein	2.22	2.13	20.3
50	VCAM1	Vascular Cell Adhesion Molecule 1	Protein	1.87	2.09	53.5
51	DAO	D-Amino Acid Oxidase	Protein	1.87	2.09	51
52	DPP4	Dipeptidyl Peptidase 4	Protein	1.87	2.09	68.7
53	CBS	Cystathionine Beta-Synthase	Protein	1.85	2.05	54.7
54	DBH	Dopamine Beta-Hydroxylase	Protein	1.77	2.05	16.1
55	NCF1	Neutrophil Cytosolic Factor 1	Protein	1.76	2.04 ND	
56	CYBB	Cytochrome B-245 Beta Chain	Protein	1.76	2.04	71.2
57	OPRK1	Opioid Receptor Kappa 1	Protein	1.76	2.04	72.1
58	PLG	Plasminogen	Protein	1.76	2.04	38.2
59	CHGA	Chromogranin A	Protein	1.76	2.04	15.2
60	PRKAA1	Protein Kinase AMP-Activated Catalytic Subunit Alpha 1	Protein	1.76	2.04	83.4
61	GPX3	Glutathione Peroxidase 3	Protein	1.76	2.04	74.2
62	SLC25A20	Solute Carrier Family 25 Member 20	Protein	1.76	2.04	70.3
63	ACO2	Aconitase 2	Protein	1.76	2.04	80.9
64	TH	Tyrosine Hydroxylase	Protein	1.45	1.94	22.6
65	MAP2	Microtubule Associated Protein 2	Protein	1.45	1.94	67.5
66	CACNA1A	Calcium Voltage-Gated Channel Subunit Alpha1 A	Protein	1.2	1.92	51.4
67	HTR1A	5-Hydroxytryptamine Receptor 1A	Protein	1.13	1.91	56.9

68	TLR4	Toll Like Receptor 4	Protein	1	1.9	25.4
69	MTR	5-Methyltetrahydrofolate-Homocysteine Methyltransferase	Protein	1	1.9	44.6
70	NOS2	Nitric Oxide Synthase 2	Protein	1	1.9	46.6
71	RAC1	Rac Family Small GTPase 1	Protein	1	1.9	78.2
72	GRK2	G Protein-Coupled Receptor Kinase 2	Protein	1	1.9	87.9
73	GRIA2	Glutamate Ionotropic Receptor AMPA Type Subunit 2	Protein	0.88	1.88	84.2
74	NOS1	Nitric Oxide Synthase 1	Protein	0.88	1.88	50.6
75	CNR1	Cannabinoid Receptor 1	Protein	0.88	1.88	87.5
76	GSR	Glutathione-Disulfide Reductase	Protein	0.88	1.88	31.7
77	PDE4A	Phosphodiesterase 4A	Protein	0.88	1.88	57.4
78	APLP1	Amyloid Beta Precursor Like Protein 1	Protein	0.88	1.88	71.1
79	GLRX	Glutaredoxin	Protein	0.88	1.88	67.2
80	AKT1	AKT Serine/Threonine Kinase 1	Protein	0.85	1.84	90.8
81	AFG3L2	AFG3 Like Matrix AAA Peptidase Subunit 2	Protein	0.85	1.84	86.3
82	SLC1A3	Solute Carrier Family 1 Member 3	Protein	0.85	1.84	58
83	MAOA	Monoamine Oxidase A	Protein	0.85	1.84	84.1
84	TUBA1A	Tubulin Alpha 1a	Protein	0.85	1.84 ND	
85	DNMT1	DNA Methyltransferase 1	Protein	0.85	1.84	73.2
86	CHRM1	Cholinergic Receptor Muscarinic 1	Protein	0.85	1.84	87.1
87	MAT1A	Methionine Adenosyltransferase 1A	Protein	0.63	1.81	84.3
88	TPH1	Tryptophan Hydroxylase 1	Protein	0.6	1.79	54.7
89	CALR	Calreticulin	Protein	0.6	1.79	60.5
90	PRKCB	Protein Kinase C Beta	Protein	0.6	1.79	87.4
91	HPRT1	Hypoxanthine Phosphoribosyltransferase 1	Protein	0.6	1.79	77.5
92	CASP9	Caspase 9	Protein	0.6	1.79	26.4
93	LDLR	Low Density Lipoprotein Receptor	Protein	0.6	1.79	58
94	CXCR4	C-X-C Motif Chemokine Receptor 4	Protein	0.6	1.79	78.3
95	VLDLR	Very Low Density Lipoprotein Receptor	Protein	0.6	1.79	60.6
96	LRP2	LDL Receptor Related Protein 2	Protein	0.6	1.79	23
97	GLO1	Glyoxalase I	Protein	0.6	1.79	42.6
98	HRH1	Histamine Receptor H1	Protein	0.6	1.79	43.3
99	PIK3CD	Phosphatidylinositol-4,5-Bisphosphate 3-Kinase Catalytic Subunit Delta	Protein	0.6	1.79	70.8
100	ATM	ATM Serine/Threonine Kinase	Protein	0.6	1.79	30.3
101	PAWR	Pro-Apoptotic WT1 Regulator	Protein	0.6	1.79	33.9
102	GSTM1	Glutathione S-Transferase Mu 1	Protein	0.6	1.79 ND	
103	AOC3	Amine Oxidase Copper Containing 3	Protein	0.6	1.79	19.4

104	CNR2	Cannabinoid Receptor 2	Protein	0.6	1.79	60.7
105	GRB2	Growth Factor Receptor Bound Protein 2	Protein	0.6	1.79	81.1
106	NCF2	Neutrophil Cytosolic Factor 2	Protein	0.6	1.79	13.9
107	GRIA1	Glutamate Ionotropic Receptor AMPA Type Subunit 1	Protein	0.6	1.79	61.3
108	MTNR1A	Melatonin Receptor 1A	Protein	0.6	1.79	41.6
109	KCNC3	Potassium Voltage-Gated Channel Subfamily C Member 3	Protein	0.6	1.79	67.5
110	CHRM2	Cholinergic Receptor Muscarinic 2	Protein	0.6	1.79	63.1
111	GSTP1	Glutathione S-Transferase Pi 1	Protein	0.6	1.79	33.1
112	SUCLA2	Succinate-CoA Ligase ADP-Forming Subunit Beta	Protein	0.6	1.79	34
113	NQO1	NAD(P)H Quinone Dehydrogenase 1	Protein	0.6	1.79	14.7
114	SUCLG1	Succinate-CoA Ligase GDP/ADP-Forming Subunit Alpha	Protein	0.6	1.79	57.2
115	ABL1	ABL Proto-Oncogene 1, Non-Receptor Tyrosine Kinase	Protein	0.6	1.79	74.1
116	ADORA1	Adenosine A1 Receptor	Protein	0.6	1.79	79
117	OGDH	Oxoglutarate Dehydrogenase	Protein	0.6	1.79	68.5
118	PTGS1	Prostaglandin-Endoperoxide Synthase 1	Protein	0.6	1.79	25.3
119	ITGB2	Integrin Subunit Beta 2	Protein	0.6	1.79	71.5
120	ALDH5A1	Aldehyde Dehydrogenase 5 Family Member A1	Protein	0.6	1.79	22.2
121	COX5A	Cytochrome C Oxidase Subunit 5A	Protein	0.6	1.79	78.9
122	PGR	Progesterone Receptor	Protein	0.6	1.79	37.9
123	PRKCA	Protein Kinase C Alpha	Protein	0.6	1.79	89.4
124	SOAT1	Sterol O-Acyltransferase 1	Protein	0.6	1.79	48.2
125	CHRNB2	Cholinergic Receptor Nicotinic Beta 2 Subunit	Protein	0.6	1.79	84.8
126	HTR3D	5-Hydroxytryptamine Receptor 3D	Protein	0.6	1.79	11.2
127	GRIA3	Glutamate Ionotropic Receptor AMPA Type Subunit 3	Protein	0.6	1.79	90
128	PLD2	Phospholipase D2	Protein	0.6	1.79	11.5
129	CHRNA4	Cholinergic Receptor Nicotinic Alpha 4 Subunit	Protein	0.6	1.79	82.9
130	TYR	Tyrosinase	Protein	0.6	1.79	50.7
131	PPARG	Peroxisome Proliferator Activated Receptor Gamma	Protein	0.6	1.79	58.4
132	JUN	Jun Proto-Oncogene, AP-1 Transcription Factor Subunit	Protein	0.6	1.79	79.9
133	HTR6	5-Hydroxytryptamine Receptor 6	Protein	0.6	1.79	70.3
134	PPARA	Peroxisome Proliferator Activated Receptor Alpha	Protein	0.6	1.79	37
135	P4HB	Prolyl 4-Hydroxylase Subunit Beta	Protein	0.6	1.79	76.3
136	ALOX5	Arachidonate 5-Lipoxygenase	Protein	0.6	1.79	77.2
137	HTR2C	5-Hydroxytryptamine Receptor 2C	Protein	0.6	1.79	33.3
138	HSPA5	Heat Shock Protein Family A (Hsp70) Member 5	Protein	0.6	1.79	81.7
139	NFKBIA	NFKB Inhibitor Alpha	Protein	0.6	1.79	80.1

140	DRD1	Dopamine Receptor D1	Protein	0.6	1.79	73.9
141	SLC6A2	Solute Carrier Family 6 Member 2	Protein	0.6	1.79	57.5
142	BLVRB	Biliverdin Reductase B	Protein	0.6	1.79	32.4
143	CREB1	CAMP Responsive Element Binding Protein 1	Protein	0.6	1.79	63
144	ADRB2	Adrenoceptor Beta 2	Protein	0.6	1.79	41
145	POR	Cytochrome P450 Oxidoreductase	Protein	0.6	1.79 ND	
146	GRIN1	Glutamate Ionotropic Receptor NMDA Type Subunit 1	Protein	0.6	1.79	95.9
147	GRIN2B	Glutamate Ionotropic Receptor NMDA Type Subunit 2B	Protein	0.6	1.79	87.2
148	DRD4	Dopamine Receptor D4	Protein	0.6	1.79 ND	
149	CYP19A1	Cytochrome P450 Family 19 Subfamily A Member 1	Protein	0.57	1.52	49.3
150	KCNC1	Potassium Voltage-Gated Channel Subfamily C Member 1	Protein	0.57	1.52	89.6
151	GPX1	Glutathione Peroxidase 1	Protein	0.49	1.51	29.7
152	KCNQ2	Potassium Voltage-Gated Channel Subfamily Q Member 2	Protein	0.49	1.51	70.8
153	GSTM3	Glutathione S-Transferase Mu 3	Protein	0.49	1.51	41.3
154	SCN8A	Sodium Voltage-Gated Channel Alpha Subunit 8	Protein	0.49	1.51	80
155	MTRR	5-Methyltetrahydrofolate-Homocysteine Methyltransferase Reductase	Protein	0.4	1.51	21.3
156	HDAC2	Histone Deacetylase 2	Protein	0.4	1.51	50
157	GPX4	Glutathione Peroxidase 4	Protein	0.28	1.47 ND	
158	HTR3A	5-Hydroxytryptamine Receptor 3A	Protein	0.28	1.47	58.6
159	CAT	Catalase	Protein	0.28	1.47	66.8
160	SLC23A2	Solute Carrier Family 23 Member 2	Protein	0.28	1.47	85.8
161	NPPA	Natriuretic Peptide A	Protein	0.28	1.47	21.3
162	SERPINE1	Serpin Family E Member 1	Protein	0.28	1.47	47.4
163	TXNRD1	Thioredoxin Reductase 1	Protein	0.28	1.47	69
164	SLC23A1	Solute Carrier Family 23 Member 1	Protein	0.28	1.47	43.3
165	PGRMC1	Progesterone Receptor Membrane Component 1	Protein	0.28	1.47	58.2
166	IFNG	Interferon Gamma	Protein	0.28	1.47	81
167	ASRGL1	Asparaginase And Isoaspartyl Peptidase 1	Protein	0.28	1.47	64.4
168	SST	Somatostatin	Protein	0.28	1.47	51.1
169	TUBA4A	Tubulin Alpha 4a	Protein	0.28	1.47	92.8
170	GAMT	Guanidinoacetate N-Methyltransferase	Protein	0.28	1.47	48.2

<Banhasasim-tang target list>

#	Symbol	Description (Query "mild cognitive impairment")	Type	Score	-Log10(p)	Average Disease Causing Likelihood
1	BACE1	Beta-Secretase 1	Protein	14.05	3.76	78.7
2	BCHE	Butyrylcholinesterase	Protein	11.7	3.59	18
3	WARS2	Tryptophanyl TRNA Synthetase 2, Mitochondrial	Protein	11.23	3.54	30.3
4	ACHE	Acetylcholinesterase (Cartwright Blood Group)	Protein	9.93	3.14	43.9
5	IL1B	Interleukin 1 Beta	Protein	9.64	3.11	81.8
6	ADRA2B	Adrenoceptor Alpha 2B	Protein	8.77	2.96	49.7
7	ABCA7	ATP Binding Cassette Subfamily A Member 7	Protein	8.36	2.94	2
8	DLG4	Discs Large MAGUK Scaffold Protein 4	Protein	7.99	2.91	82.8
9	SLC6A3	Solute Carrier Family 6 Member 3	Protein	7.28	2.89	84.9
10	INS	Insulin	Protein	6.89	2.87	74.5
11	TNF	Tumor Necrosis Factor	Protein	6.53	2.82	70.4
12	NOS3	Nitric Oxide Synthase 3	Protein	5.56	2.74	58.5
13	MTHFR	Methylenetetrahydrofolate Reductase	Protein	4.92	2.71	22.2
14	COMT	Catechol-O-Methyltransferase	Protein	4.59	2.68	11.8
15	ACE	Angiotensin I Converting Enzyme	Protein	4.59	2.68	15.8
16	TP53	Tumor Protein P53	Protein	4.15	2.65	72.8
17	CHRNA7	Cholinergic Receptor Nicotinic Alpha 7 Subunit	Protein	3.84	2.61	58.3
18	BCL2	BCL2 Apoptosis Regulator	Protein	3.64	2.57	48.6
19	DRD2	Dopamine Receptor D2	Protein	3.62	2.56	63.3
20	HTR2A	5-Hydroxytryptamine Receptor 2A	Protein	3.5	2.54	62.1
21	MAOB	Monoamine Oxidase B	Protein	3.42	2.52	84.5
22	ESR1	Estrogen Receptor 1	Protein	3.38	2.52	68.5
23	BLVRA	Biliverdin Reductase A	Protein	3.19	2.47	39.8
24	VDR	Vitamin D Receptor	Protein	3.12	2.44	64.2
25	ADORA2A	Adenosine A2a Receptor	Protein	3.08	2.44	64.8
26	DRD3	Dopamine Receptor D3	Protein	3.08	2.44	60.2
27	HMGCR	3-Hydroxy-3-Methylglutaryl-CoA Reductase	Protein	2.97	2.4	83.1
28	MPO	Myeloperoxidase	Protein	2.91	2.4	33.8
29	AIFM1	Apoptosis Inducing Factor Mitochondria Associated 1	Protein	2.91	2.4	72.5
30	ITPR1	Inositol 1,4,5-Trisphosphate Receptor Type 1	Protein	2.91	2.4	73.5
31	PIK3R1	Phosphoinositide-3-Kinase Regulatory Subunit 1	Protein	2.91	2.4	54.4
32	SCN4A	Sodium Voltage-Gated Channel Alpha Subunit 4	Protein	2.91	2.4	43.3

33	ABCB1	ATP Binding Cassette Subfamily B Member 1	Protein	2.49	2.22	58
34	RAB7A	RAB7A, Member RAS Oncogene Family	Protein	2.49	2.22	82
35	SIGMAR1	Sigma Non-Opioid Intracellular Receptor 1	Protein	2.49	2.22	36.3
36	DRD5	Dopamine Receptor D5	Protein	2.49	2.22	34.6
37	SLC6A4	Solute Carrier Family 6 Member 4	Protein	2.47	2.19	73
38	ABCA1	ATP Binding Cassette Subfamily A Member 1	Protein	2.47	2.19	51.7
39	ESR2	Estrogen Receptor 2	Protein	2.47	2.19	54.1
40	GSTO1	Glutathione S-Transferase Omega 1	Protein	2.47	2.19	17.7
41	ALB	Albumin	Protein	2.47	2.19	82.3
42	PTGS2	Prostaglandin-Endoperoxide Synthase 2	Protein	2.47	2.19	66.5
43	ALDH2	Aldehyde Dehydrogenase 2 Family Member	Protein	2.35	2.16	51.1
44	GRIN2A	Glutamate Ionotropic Receptor NMDA Type Subunit 2A	Protein	2.35	2.16	78.3
45	MAPK1	Mitogen-Activated Protein Kinase 1	Protein	2.35	2.16	73.8
46	GLUL	Glutamate-Ammonia Ligase	Protein	2.35	2.16	87.5
47	OPRM1	Opioid Receptor Mu 1	Protein	2.35	2.16	7.8
48	MMP9	Matrix Metalloproteinase 9	Protein	2.22	2.13	20.3
49	VCAM1	Vascular Cell Adhesion Molecule 1	Protein	1.87	2.09	53.5
50	DAO	D-Amino Acid Oxidase	Protein	1.87	2.09	51
51	CBS	Cystathionine Beta-Synthase	Protein	1.85	2.05	54.7
52	DBH	Dopamine Beta-Hydroxylase	Protein	1.77	2.05	16.1
53	GPX3	Glutathione Peroxidase 3	Protein	1.76	2.04	74.2
54	PKM	Pyruvate Kinase M1/2	Protein	1.76	2.04	82
55	PLG	Plasminogen	Protein	1.76	2.04	38.2
56	ACO2	Aconitase 2	Protein	1.76	2.04	80.9
57	CXCL8	C-X-C Motif Chemokine Ligand 8	Protein	1.76	2.04	70.1
58	PRKAA1	Protein Kinase AMP-Activated Catalytic Subunit Alpha 1	Protein	1.76	2.04	83.4
59	OPRK1	Opioid Receptor Kappa 1	Protein	1.76	2.04	72.1
60	CYBB	Cytochrome B-245 Beta Chain	Protein	1.76	2.04	71.2
61	SLC25A20	Solute Carrier Family 25 Member 20	Protein	1.76	2.04	70.3
62	NCF1	Neutrophil Cytosolic Factor 1	Protein	1.76	2.04 ND	
63	TH	Tyrosine Hydroxylase	Protein	1.45	1.94	22.6
64	PARK7	Parkinsonism Associated Deglycase	Protein	1.45	1.94	54
65	CACNA1A	Calcium Voltage-Gated Channel Subunit Alpha1 A	Protein	1.2	1.92	51.4
66	HTR1A	5-Hydroxytryptamine Receptor 1A	Protein	1.13	1.91	56.9
67	NOS2	Nitric Oxide Synthase 2	Protein	1	1.9	46.6

68	RAC1	Rac Family Small GTPase 1	Protein	1	1.9	78.2
69	TLR4	Toll Like Receptor 4	Protein	1	1.9	25.4
70	MTR	5-Methyltetrahydrofolate-Homocysteine Methyltransferase	Protein	1	1.9	44.6
71	GRK2	G Protein-Coupled Receptor Kinase 2	Protein	1	1.9	87.9
72	CNR1	Cannabinoid Receptor 1	Protein	0.88	1.88	87.5
73	PDE4A	Phosphodiesterase 4A	Protein	0.88	1.88	57.4
74	NOS1	Nitric Oxide Synthase 1	Protein	0.88	1.88	50.6
75	GRIA2	Glutamate Ionotropic Receptor AMPA Type Subunit 2	Protein	0.88	1.88	84.2
76	GSR	Glutathione-Disulfide Reductase	Protein	0.88	1.88	31.7
77	SRR	Serine Racemase	Protein	0.88	1.88	86.3
78	APLP1	Amyloid Beta Precursor Like Protein 1	Protein	0.88	1.88	71.1
79	GLRX	Glutaredoxin	Protein	0.88	1.88	67.2
80	VDAC1	Voltage Dependent Anion Channel 1	Protein	0.88	1.88	80.1
81	SLC1A3	Solute Carrier Family 1 Member 3	Protein	0.85	1.84	58
82	TUBA1A	Tubulin Alpha 1a	Protein	0.85	1.84 ND	
83	MAOA	Monoamine Oxidase A	Protein	0.85	1.84	84.1
84	CHRM1	Cholinergic Receptor Muscarinic 1	Protein	0.85	1.84	87.1
85	DNMT1	DNA Methyltransferase 1	Protein	0.85	1.84	73.2
86	AKT1	AKT Serine/Threonine Kinase 1	Protein	0.85	1.84	90.8
87	AFG3L2	AFG3 Like Matrix AAA Peptidase Subunit 2	Protein	0.85	1.84	86.3
88	MAT1A	Methionine Adenosyltransferase 1A	Protein	0.63	1.81	84.3
89	NCF2	Neutrophil Cytosolic Factor 2	Protein	0.6	1.79	13.9
90	PIK3CD	Phosphatidylinositol-4,5-Bisphosphate 3-Kinase Catalytic Subunit Delta	Protein	0.6	1.79	70.8
91	ATM	ATM Serine/Threonine Kinase	Protein	0.6	1.79	30.3
92	HRH1	Histamine Receptor H1	Protein	0.6	1.79	43.3
93	AOC3	Amine Oxidase Copper Containing 3	Protein	0.6	1.79	19.4
94	HPRT1	Hypoxanthine Phosphoribosyltransferase 1	Protein	0.6	1.79	77.5
95	SUCLG1	Succinate-CoA Ligase GDP/ADP-Forming Subunit Alpha	Protein	0.6	1.79	57.2
96	CHRNA4	Cholinergic Receptor Nicotinic Alpha 4 Subunit	Protein	0.6	1.79	82.9
97	SUCLA2	Succinate-CoA Ligase ADP-Forming Subunit Beta	Protein	0.6	1.79	34
98	GRIA1	Glutamate Ionotropic Receptor AMPA Type Subunit 1	Protein	0.6	1.79	61.3
99	MTNR1A	Melatonin Receptor 1A	Protein	0.6	1.79	41.6
100	PPARA	Peroxisome Proliferator Activated Receptor Alpha	Protein	0.6	1.79	37
101	GSTM1	Glutathione S-Transferase Mu 1	Protein	0.6	1.79 ND	
102	CHRNB2	Cholinergic Receptor Nicotinic Beta 2 Subunit	Protein	0.6	1.79	84.8

103	GLO1	Glyoxalase I	Protein	0.6	1.79	42.6
104	HSPA5	Heat Shock Protein Family A (Hsp70) Member 5	Protein	0.6	1.79	81.7
105	ITGB2	Integrin Subunit Beta 2	Protein	0.6	1.79	71.5
106	POR	Cytochrome P450 Oxidoreductase	Protein	0.6	1.79 ND	
107	NFKBIA	NFKB Inhibitor Alpha	Protein	0.6	1.79	80.1
108	GRIA3	Glutamate Ionotropic Receptor AMPA Type Subunit 3	Protein	0.6	1.79	90
109	VLDLR	Very Low Density Lipoprotein Receptor	Protein	0.6	1.79	60.6
110	GRB2	Growth Factor Receptor Bound Protein 2	Protein	0.6	1.79	81.1
111	HTR3D	5-Hydroxytryptamine Receptor 3D	Protein	0.6	1.79	11.2
112	CASP9	Caspase 9	Protein	0.6	1.79	26.4
113	PRKCB	Protein Kinase C Beta	Protein	0.6	1.79	87.4
114	ABL1	ABL Proto-Oncogene 1, Non-Receptor Tyrosine Kinase	Protein	0.6	1.79	74.1
115	SLC1A2	Solute Carrier Family 1 Member 2	Protein	0.6	1.79	85
116	DRD1	Dopamine Receptor D1	Protein	0.6	1.79	73.9
117	GRIN1	Glutamate Ionotropic Receptor NMDA Type Subunit 1	Protein	0.6	1.79	95.9
118	GSTP1	Glutathione S-Transferase Pi 1	Protein	0.6	1.79	33.1
119	JUN	Jun Proto-Oncogene, AP-1 Transcription Factor Subunit	Protein	0.6	1.79	79.9
120	PTGS1	Prostaglandin-Endoperoxide Synthase 1	Protein	0.6	1.79	25.3
121	PPIG	Peptidylprolyl Isomerase G	Protein	0.6	1.79	47.6
122	GRIN2B	Glutamate Ionotropic Receptor NMDA Type Subunit 2B	Protein	0.6	1.79	87.2
123	KCNC3	Potassium Voltage-Gated Channel Subfamily C Member 3	Protein	0.6	1.79	67.5
124	PPARG	Peroxisome Proliferator Activated Receptor Gamma	Protein	0.6	1.79	58.4
125	ADORA1	Adenosine A1 Receptor	Protein	0.6	1.79	79
126	PLD2	Phospholipase D2	Protein	0.6	1.79	11.5
127	TPH1	Tryptophan Hydroxylase 1	Protein	0.6	1.79	54.7
128	DRD4	Dopamine Receptor D4	Protein	0.6	1.79 ND	
129	PGR	Progesterone Receptor	Protein	0.6	1.79	37.9
130	ALDH5A1	Aldehyde Dehydrogenase 5 Family Member A1	Protein	0.6	1.79	22.2
131	CREB1	CAMP Responsive Element Binding Protein 1	Protein	0.6	1.79	63
132	P4HB	Prolyl 4-Hydroxylase Subunit Beta	Protein	0.6	1.79	76.3
133	TYR	Tyrosinase	Protein	0.6	1.79	50.7
134	SLC6A2	Solute Carrier Family 6 Member 2	Protein	0.6	1.79	57.5
135	ALOX5	Arachidonate 5-Lipoxygenase	Protein	0.6	1.79	77.2
136	CXCR4	C-X-C Motif Chemokine Receptor 4	Protein	0.6	1.79	78.3
137	PAWR	Pro-Apoptotic WT1 Regulator	Protein	0.6	1.79	33.9



138	CNR2	Cannabinoid Receptor 2	Protein	0.6	1.79	60.7
139	NQO1	NAD(P)H Quinone Dehydrogenase 1	Protein	0.6	1.79	14.7
140	PRKCA	Protein Kinase C Alpha	Protein	0.6	1.79	89.4
141	FXN	Frataxin	Protein	0.6	1.79	57.3
142	SOAT1	Sterol O-Acyltransferase 1	Protein	0.6	1.79	48.2
143	CHRM2	Cholinergic Receptor Muscarinic 2	Protein	0.6	1.79	63.1
144	COX5A	Cytochrome C Oxidase Subunit 5A	Protein	0.6	1.79	78.9
145	HTR2C	5-Hydroxytryptamine Receptor 2C	Protein	0.6	1.79	33.3
146	OGDH	Oxoglutarate Dehydrogenase	Protein	0.6	1.79	68.5
147	ADRB2	Adrenoceptor Beta 2	Protein	0.6	1.79	41
148	LDLR	Low Density Lipoprotein Receptor	Protein	0.6	1.79	58
149	KCNC1	Potassium Voltage-Gated Channel Subfamily C Member 1	Protein	0.57	1.52	89.6
150	CYP19A1	Cytochrome P450 Family 19 Subfamily A Member 1	Protein	0.57	1.52	49.3
151	GPX1	Glutathione Peroxidase 1	Protein	0.49	1.51	29.7
152	KCNQ2	Potassium Voltage-Gated Channel Subfamily Q Member 2	Protein	0.49	1.51	70.8
153	SCN8A	Sodium Voltage-Gated Channel Alpha Subunit 8	Protein	0.49	1.51	80
154	GSTM3	Glutathione S-Transferase Mu 3	Protein	0.49	1.51	41.3
155	MTRR	5-Methyltetrahydrofolate-Homocysteine Methyltransferase Reductase	Protein	0.4	1.51	21.3
156	SLC16A4	Solute Carrier Family 16 Member 4	Protein	0.4	1.51	55.3
157	MMP2	Matrix Metalloproteinase 2	Protein	0.4	1.51	71.8
158	HDAC2	Histone Deacetylase 2	Protein	0.4	1.51	50
159	PGRMC1	Progesterone Receptor Membrane Component 1	Protein	0.28	1.47	58.2
160	ASRGL1	Asparaginase And Isoaspartyl Peptidase 1	Protein	0.28	1.47	64.4
161	CAT	Catalase	Protein	0.28	1.47	66.8
162	TXNRD1	Thioredoxin Reductase 1	Protein	0.28	1.47	69
163	GAMT	Guanidinoacetate N-Methyltransferase	Protein	0.28	1.47	48.2
164	PLPBP	Pyridoxal Phosphate Binding Protein	Protein	0.28	1.47	63.2
165	SERPINE1	Serpin Family E Member 1	Protein	0.28	1.47	47.4
166	NPPA	Natriuretic Peptide A	Protein	0.28	1.47	21.3
167	TUBA4A	Tubulin Alpha 4a	Protein	0.28	1.47	92.8
168	IFNG	Interferon Gamma	Protein	0.28	1.47	81
169	HTR3A	5-Hydroxytryptamine Receptor 3A	Protein	0.28	1.47	58.6
170	GPX4	Glutathione Peroxidase 4	Protein	0.28	1.47 ND	

<YMJ target list>

#	Symbol	Description (Query "mild cognitive impairment")	Type	Score	-Log10(p)	Average Disease Causing Likelihood
1	MAPT	Microtubule Associated Protein Tau	Protein	19.5	4.06	14.1
2	BCHE	Butyrylcholinesterase	Protein	11.7	3.59	18
3	ACHE	Acetylcholinesterase (Cartwright Blood Group)	Protein	9.93	3.14	43.9
4	ADRA2B	Adrenoceptor Alpha 2B	Protein	8.77	2.96	49.7
5	DLG4	Discs Large MAGUK Scaffold Protein 4	Protein	7.99	2.91	82.8
6	SLC6A3	Solute Carrier Family 6 Member 3	Protein	7.28	2.89	84.9
7	INS	Insulin	Protein	6.89	2.87	74.5
8	TNF	Tumor Necrosis Factor	Protein	6.53	2.82	70.4
9	COMT	Catechol-O-Methyltransferase	Protein	4.59	2.68	11.8
10	ACE	Angiotensin I Converting Enzyme	Protein	4.59	2.68	15.8
11	CHRNA7	Cholinergic Receptor Nicotinic Alpha 7 Subunit	Protein	3.84	2.61	58.3
12	BCL2	BCL2 Apoptosis Regulator	Protein	3.64	2.57	48.6
13	DNMT3A	DNA Methyltransferase 3 Alpha	Protein	3.64	2.57	86.7
14	DRD2	Dopamine Receptor D2	Protein	3.62	2.56	63.3
15	HTR2A	5-Hydroxytryptamine Receptor 2A	Protein	3.5	2.54	62.1
16	ESR1	Estrogen Receptor 1	Protein	3.38	2.52	68.5
17	VDR	Vitamin D Receptor	Protein	3.12	2.44	64.2
18	ADORA2A	Adenosine A2a Receptor	Protein	3.08	2.44	64.8
19	DRD3	Dopamine Receptor D3	Protein	3.08	2.44	60.2
20	HMGCR	3-Hydroxy-3-Methylglutaryl-CoA Reductase	Protein	2.97	2.4	83.1
21	ITPR1	Inositol 1,4,5-Trisphosphate Receptor Type 1	Protein	2.91	2.4	73.5
22	SCN4A	Sodium Voltage-Gated Channel Alpha Subunit 4	Protein	2.91	2.4	43.3
23	PIK3R1	Phosphoinositide-3-Kinase Regulatory Subunit 1	Protein	2.91	2.4	54.4
24	RAB7A	RAB7A, Member RAS Oncogene Family	Protein	2.49	2.22	82
25	ABCB1	ATP Binding Cassette Subfamily B Member 1	Protein	2.49	2.22	58
26	DRD5	Dopamine Receptor D5	Protein	2.49	2.22	34.6
27	ESR2	Estrogen Receptor 2	Protein	2.47	2.19	54.1
28	SLC6A4	Solute Carrier Family 6 Member 4	Protein	2.47	2.19	73
29	PTGS2	Prostaglandin-Endoperoxide Synthase 2	Protein	2.47	2.19	66.5
30	ALB	Albumin	Protein	2.47	2.19	82.3
31	ALDH2	Aldehyde Dehydrogenase 2 Family Member	Protein	2.35	2.16	51.1
32	MAPK1	Mitogen-Activated Protein Kinase 1	Protein	2.35	2.16	73.8
33	OPRM1	Opioid Receptor Mu 1	Protein	2.35	2.16	7.8
34	GRIN2A	Glutamate Ionotropic Receptor NMDA Type Subunit 2A	Protein	2.35	2.16	78.3

35	VCAM1	Vascular Cell Adhesion Molecule 1	Protein	1.87	2.09	53.5
36	CBS	Cystathionine Beta-Synthase	Protein	1.85	2.05	54.7
37	DBH	Dopamine Beta-Hydroxylase	Protein	1.77	2.05	16.1
38	CHGA	Chromogranin A	Protein	1.76	2.04	15.2
39	PLG	Plasminogen	Protein	1.76	2.04	38.2
40	PRKAA1	Protein Kinase AMP-Activated Catalytic Subunit Alpha 1	Protein	1.76	2.04	83.4
41	OPRK1	Opioid Receptor Kappa 1	Protein	1.76	2.04	72.1
42	MAP2	Microtubule Associated Protein 2	Protein	1.45	1.94	67.5
43	HTR1A	5-Hydroxytryptamine Receptor 1A	Protein	1.13	1.91	56.9
44	APLP1	Amyloid Beta Precursor Like Protein 1	Protein	0.88	1.88	71.1
45	CNR1	Cannabinoid Receptor 1	Protein	0.88	1.88	87.5
46	PDE4A	Phosphodiesterase 4A	Protein	0.88	1.88	57.4
47	GRIA2	Glutamate Ionotropic Receptor AMPA Type Subunit 2	Protein	0.88	1.88	84.2
48	CHRM1	Cholinergic Receptor Muscarinic 1	Protein	0.85	1.84	87.1
49	MAT1A	Methionine Adenosyltransferase 1A	Protein	0.63	1.81	84.3
50	DRD4	Dopamine Receptor D4	Protein	0.6	1.79 ND	
51	SLC6A2	Solute Carrier Family 6 Member 2	Protein	0.6	1.79	57.5
52	PIK3CD	Phosphatidylinositol-4,5-Bisphosphate 3-Kinase Catalytic Subunit Delta	Protein	0.6	1.79	70.8
53	ITGB2	Integrin Subunit Beta 2	Protein	0.6	1.79	71.5
54	HPRT1	Hypoxanthine Phosphoribosyltransferase 1	Protein	0.6	1.79	77.5
55	ALDH5A1	Aldehyde Dehydrogenase 5 Family Member A1	Protein	0.6	1.79	22.2
56	CXCR4	C-X-C Motif Chemokine Receptor 4	Protein	0.6	1.79	78.3
57	OGDH	Oxoglutarate Dehydrogenase	Protein	0.6	1.79	68.5
58	DRD1	Dopamine Receptor D1	Protein	0.6	1.79	73.9
59	CREB1	CAMP Responsive Element Binding Protein 1	Protein	0.6	1.79	63
60	HTR6	5-Hydroxytryptamine Receptor 6	Protein	0.6	1.79	70.3
61	COX5A	Cytochrome C Oxidase Subunit 5A	Protein	0.6	1.79	78.9
62	PLD2	Phospholipase D2	Protein	0.6	1.79	11.5
63	ATM	ATM Serine/Threonine Kinase	Protein	0.6	1.79	30.3
64	PRKCB	Protein Kinase C Beta	Protein	0.6	1.79	87.4
65	PTGS1	Prostaglandin-Endoperoxide Synthase 1	Protein	0.6	1.79	25.3
66	ADORA1	Adenosine A1 Receptor	Protein	0.6	1.79	79
67	TYR	Tyrosinase	Protein	0.6	1.79	50.7
68	GRIN1	Glutamate Ionotropic Receptor NMDA Type Subunit 1	Protein	0.6	1.79	95.9
69	GRIN2B	Glutamate Ionotropic Receptor NMDA Type Subunit 2B	Protein	0.6	1.79	87.2
70	CHRNA4	Cholinergic Receptor Nicotinic Alpha 4 Subunit	Protein	0.6	1.79	82.9
71	ADRB2	Adrenoceptor Beta 2	Protein	0.6	1.79	41

72	ALOX5	Arachidonate 5-Lipoxygenase	Protein	0.6	1.79	77.2
73	CNR2	Cannabinoid Receptor 2	Protein	0.6	1.79	60.7
74	GRIA1	Glutamate Ionotropic Receptor AMPA Type Subunit 1	Protein	0.6	1.79	61.3
75	HTR3D	5-Hydroxytryptamine Receptor 3D	Protein	0.6	1.79	11.2
76	CHRN2	Cholinergic Receptor Nicotinic Beta 2 Subunit	Protein	0.6	1.79	84.8
77	GRIA3	Glutamate Ionotropic Receptor AMPA Type Subunit 3	Protein	0.6	1.79	90
78	AOC3	Amine Oxidase Copper Containing 3	Protein	0.6	1.79	19.4
79	KCNC3	Potassium Voltage-Gated Channel Subfamily C Member 3	Protein	0.6	1.79	67.5
80	PRKCA	Protein Kinase C Alpha	Protein	0.6	1.79	89.4
81	SOAT1	Sterol O-Acyltransferase 1	Protein	0.6	1.79	48.2
82	PGR	Progesterone Receptor	Protein	0.6	1.79	37.9
83	HRH1	Histamine Receptor H1	Protein	0.6	1.79	43.3
84	CHRM2	Cholinergic Receptor Muscarinic 2	Protein	0.6	1.79	63.1
85	HTR2C	5-Hydroxytryptamine Receptor 2C	Protein	0.6	1.79	33.3
86	CYP19A1	Cytochrome P450 Family 19 Subfamily A Member 1	Protein	0.57	1.52	49.3
87	KCNC1	Potassium Voltage-Gated Channel Subfamily C Member 1	Protein	0.57	1.52	89.6
88	SCN8A	Sodium Voltage-Gated Channel Alpha Subunit 8	Protein	0.49	1.51	80
89	HDAC2	Histone Deacetylase 2	Protein	0.4	1.51	50
90	HTR3A	5-Hydroxytryptamine Receptor 3A	Protein	0.28	1.47	58.6
91	CAT	Catalase	Protein	0.28	1.47	66.8
92	SERPINE1	Serpin Family E Member 1	Protein	0.28	1.47	47.4
93	TUBA4A	Tubulin Alpha 4a	Protein	0.28	1.47	92.8
94	GAMT	Guanidinoacetate N-Methyltransferase	Protein	0.28	1.47	48.2
95	IFNG	Interferon Gamma	Protein	0.28	1.47	81

**<Common target list>**

<b>#</b>	<b>Symbol</b>
1	BCHE
2	ACHE
3	ADRA2B
4	DLG4
5	SLC6A3
6	INS
7	TNF
8	COMT
9	ACE
10	CHRNA7
11	BCL2
12	DRD2
13	HTR2A
14	ESR1
15	VDR
16	ADORA2A
17	DRD3
18	HMGCR
19	ITPR1
20	PIK3R1
21	SCN4A
22	ABCB1
23	DRD5
24	RAB7A
25	PTGS2
26	ALB
27	ESR2
28	SLC6A4
29	GRIN2A
30	OPRM1
31	ALDH2
32	VCAM1
33	CBS
34	DBH
35	OPRK1
36	PLG
37	PRKAA1
38	HTR1A
39	GRIA2
40	CNR1

41 PDE4A  
42 APLP1

## Supplementary 2

### <GGT Superpath>

Score	Name	# Matched Genes (Total Genes)
63.85	SuperPath: Methylphenidate Pathway, Pharmacodynamics	10 (18)
50	SuperPath: Neuroscience	17 (341)
48.42	SuperPath: Monoamine Transport	9 (33)
43.51	SuperPath: Interleukin-4 and Interleukin-13 Signaling	11 (108)
40	SuperPath: Metabolism	30 (2121)
39.58	SuperPath: Neurotransmitter Clearance	6 (10)
37.8	SuperPath: Transmission Across Chemical Synapses	15 (410)
37.46	SuperPath: Immune Response IL-23 Signaling Pathway	11 (160)
35.95	SuperPath: Development Dopamine D2 Receptor Transactivation of EGFR	10 (128)
35.23	SuperPath: Signal Transduction	31 (2590)
33.81	SuperPath: Alzheimer's Disease and MiRNA Effects	12 (266)
33.61	SuperPath: Biogenic Amine Synthesis	6 (20)
32.54	SuperPath: Burn Wound Healing	8 (75)
32.52	SuperPath: Spinal Cord Injury	9 (115)
32.24	SuperPath: Insulin Receptor Recycling	8 (77)
28.82	SuperPath: IL-10 Pathway	6 (35)
28.47	SuperPath: Sudden Infant Death Syndrome (SIDS) Susceptibility Pathways	9 (159)
27.79	SuperPath: MIF Mediated Glucocorticoid Regulation	15 (681)
27.28	SuperPath: Nuclear Receptors Meta-pathway	11 (315)
27.07	SuperPath: Monoamine GPCRs	6 (43)
26.88	SuperPath: NO/cGMP/PKG Mediated Neuroprotection	6 (44)
26.14	SuperPath: Photodynamic Therapy-induced NF-kB Survival Signaling	6 (48)
25.67	SuperPath: Plasma Membrane Estrogen Receptor Signaling	5 (24)
25.58	SuperPath: Neuroinflammation and Glutamatergic Signaling	8 (140)
25.04	SuperPath: Development VEGF Signaling Via VEGFR2 - Generic Cascades	8 (147)
24.68	SuperPath: ATF-2 Transcription Factor Network	6 (57)
24.57	SuperPath: Doxorubicin Pathway, Pharmacokinetics	5 (28)

24.54 SuperPath: G-Beta Gamma Signaling	9 (219)
24.16 SuperPath: Blood-Brain Barrier and Immune Cell Transmigration: VCAM-1/CD106 Signaling	7 (104)
24.02 SuperPath: GPCR Downstream Signalling	14 (710)
23.77 SuperPath: Colorectal Cancer Metastasis	8 (165)
23.71 SuperPath: Ferroptosis	6 (64)
23.53 SuperPath: Sympathetic Nerve Pathway (Pre- and Post- Ganglionic Junction)	4 (12)
23.32 SuperPath: One-carbon Metabolism and Related Pathways	6 (67)
23.19 SuperPath: Methotrexate Pathway (Cancer Cell), Pharmacodynamics and Pharmacokinetics	5 (34)
23.18 SuperPath: Hepatocyte Growth Factor Receptor Signaling	7 (115)
23.14 SuperPath: ADORA2B Mediated Anti-inflammatory Cytokines Production	11 (419)
23.01 SuperPath: Signaling By Receptor Tyrosine Kinases	12 (524)
22.99 SuperPath: ACE Inhibitor Pathway, Pharmacodynamics	5 (35)
22.79 SuperPath: Amyotrophic Lateral Sclerosis (ALS)	5 (36)
22.79 SuperPath: Genetic Causes of Porto-sinusoidal Vascular Disease	5 (36)
22.65 SuperPath: RXR and RAR Heterodimerization With Other Nuclear Receptor	4 (14)
22.3 SuperPath: Ca, CAMP and Lipid Signaling	7 (126)
22.25 SuperPath: Etoposide Pathway, Pharmacokinetics/Pharmacodynamics	4 (15)
21.9 SuperPath: Innate Immune System	22 (2024)
21.89 SuperPath: Ethanol Degradation II	4 (16)
21.89 SuperPath: LDL Oxidation in Atherogenesis	4 (16)
21.64 SuperPath: Development Ligand-independent Activation of ESR1 and ESR2	7 (135)
21.21 SuperPath: Tyrosine Metabolism P.1 (dopamine)	4 (18)
20.9 SuperPath: Overview of Nanoparticle Effects	4 (19)
20.9 SuperPath: Cellular Roles of Anthrax Toxin	4 (19)
20.84 SuperPath: PI3K-Akt Signaling Pathway	10 (390)
20.76 SuperPath: MSP-RON Signaling	5 (48)
20.69 SuperPath: Apoptotic Pathways in Synovial Fibroblasts	13 (731)
20.67 SuperPath: Amino Acid Metabolism	6 (92)
20.58 SuperPath: Activation of NMDA Receptors and Postsynaptic Events	6 (93)
20.47 SuperPath: IL-18 Signaling Pathway	5 (50)
20.44 SuperPath: AMPK Enzyme Complex Pathway	7 (153)
20.33 SuperPath: Sildenafil Treatment	4 (21)



20.27 SuperPath: Dopamine-DARPP32 Feedback Onto CAMP Pathway	8 (228)
20.19 SuperPath: Phosphodiesterases in Neuronal Function	5 (52)
20.07 SuperPath: Nitric Oxide Stimulates Guanylate Cyclase	4 (22)
20.06 SuperPath: AMP-activated Protein Kinase Signaling	6 (99)
19.89 SuperPath: Toll Comparative Pathway	6 (101)
19.67 SuperPath: Prostaglandin Synthesis and Regulation	5 (56)
19.57 SuperPath: G-protein Signaling_Rac2 Regulation Pathway	4 (24)
19.34 SuperPath: Pathogenesis of ALS	4 (25)
19.34 SuperPath: Signaling By VEGF	6 (108)
18.7 SuperPath: Apoptosis and Survival_Anti-apoptotic Action of Nuclear ESR1 and ESR2	4 (28)
18.54 SuperPath: Fragile X Syndrome	6 (119)
18.31 SuperPath: N-cadherin Signaling Events	4 (30)
18.12 SuperPath: CAMKK2 Pathway	4 (31)
18.03 SuperPath: Cytokine Signaling in Immune System	12 (730)
18.01 SuperPath: Folate-alcohol and Cancer Pathway Hypotheses	3 (9)
17.95 SuperPath: Nuclear Events Mediated By NFE2L2	7 (199)
17.91 SuperPath: Toll-like Receptor Signaling Pathway	8 (285)
17.77 SuperPath: Oxidative Stress Response	4 (33)
17.77 SuperPath: Signaling Mediated By P38-alpha and P38-beta	4 (33)
17.69 SuperPath: GDNF Signaling	6 (132)
17.6 SuperPath: Thromboxane A2 Receptor Signaling	4 (34)
17.6 SuperPath: Vitamin D-sensitive Calcium Signaling in Depression	4 (34)
17.13 SuperPath: Glucose / Energy Metabolism	8 (307)
17.12 SuperPath: Detoxification of Reactive Oxygen Species	4 (37)
17.12 SuperPath: LKB1 Signaling Events	4 (37)
17.06 SuperPath: PIP3 Activates AKT Signaling	8 (309)
16.45 SuperPath: Peptide Hormone Metabolism	5 (89)
16.43 SuperPath: NO-dependent CFTR Activation (normal and CF)	3 (13)
16.43 SuperPath: Dopamine Metabolism	3 (13)
16.34 SuperPath: Class A/1 (Rhodopsin-like Receptors)	10 (556)
16.29 SuperPath: Beta-Adrenergic Signaling	8 (333)
16.27 SuperPath: Fibrin Complement Receptor 3 Signaling Pathway	4 (43)

15.93 SuperPath: Small Cell Lung Cancer	5 (96)
15.86 SuperPath: Bacterial Infections in CF Airways	5 (97)
15.82 SuperPath: Methionine Metabolism	3 (15)
15.78 SuperPath: LPA Receptor Mediated Events	4 (47)
15.78 SuperPath: Beta-2 Adrenergic-dependent CFTR Expression	6 (167)
15.69 SuperPath: IL-9 Signaling Pathways	6 (169)
15.59 SuperPath: Ascorbate Recycling (cytosolic)	2 (2)
15.54 SuperPath: SREBF and MiR33 in Cholesterol and Lipid Homeostasis	3 (16)
15.27 SuperPath: FMLP Pathway	7 (266)
15.21 SuperPath: Netrin-UNC5B Signaling Pathway	4 (52)
14.99 SuperPath: Response to Elevated Platelet Cytosolic Ca <sup>2+</sup>	10 (621)
14.9 SuperPath: Hepatitis C and Hepatocellular Carcinoma	4 (55)
14.88 SuperPath: Infectious Disease	17 (1747)
14.7 SuperPath: Microglia Pathogen Phagocytosis Pathway	4 (57)
14.59 SuperPath: Antipsychotics Pathway (Metabolic Side Effects), Pharmacodynamics	3 (20)
14.42 SuperPath: Defective SLC6A3 Causes Parkinsonism-dystonia Infantile (PKDYS)	2 (3)
14.38 SuperPath: MTHFR Deficiency	3 (21)
14.38 SuperPath: PKC-gamma Calcium Signaling Pathway in Ataxia	3 (21)
14.32 SuperPath: P75(NTR)-mediated Signaling	4 (61)
14.3 SuperPath: Endometrial Cancer	6 (201)
14.3 SuperPath: Metapathway Biotransformation Phase I and II	7 (296)
14.24 SuperPath: ESR-mediated Signaling	7 (298)
14.23 SuperPath: Transcriptional Regulation By MECP2	4 (62)
14.23 SuperPath: IL 10 Signaling Pathway	4 (62)
14.23 SuperPath: CREB Pathway	9 (529)
14.18 SuperPath: Unfolded Protein Response	3 (22)
14.18 SuperPath: Inhibition of Ribosome Biogenesis By P14(ARF)	3 (22)
14.18 SuperPath: Roles of Ceramides in Development of Insulin Resistance	3 (22)
14.14 SuperPath: Lung Fibrosis	4 (63)
14.13 SuperPath: Nanog in Mammalian ESC Pluripotency	9 (534)
14 SuperPath: Sympathetic Nerve Pathway (Neuroeffector Junction)	3 (23)
14 SuperPath: A-beta Plaque Formation and APP Metabolism	3 (23)

13.82 SuperPath: RHO GTPases Activate NADPH Oxidases	3 (24)
13.82 SuperPath: Doxorubicin Pathway (Cardiomyocyte Cell), Pharmacodynamics	3 (24)
13.77 SuperPath: Myometrial Relaxation and Contraction Pathways	6 (215)
13.72 SuperPath: Neurophysiological Process Glutamate Regulation of Dopamine D1A Receptor Signaling	4 (68)
13.71 SuperPath: Toll-Like Receptor Signaling Pathways	5 (133)
13.65 SuperPath: Prolactin Signaling	8 (432)
13.64 SuperPath: Alpha9 Beta1 Integrin Signaling Events	3 (25)
13.64 SuperPath: AP-1 Transcription Factor Network	4 (69)
13.61 SuperPath: PI5P, PP2A and IER3 Regulate PI3K/AKT Signaling	5 (135)
13.6 SuperPath: Aromatase Inhibitor Pathway (Breast Cell), Pharmacodynamics	2 (4)
13.48 SuperPath: Alpha-synuclein Signaling	3 (26)
13.42 SuperPath: MTOR Signaling	5 (139)
13.42 SuperPath: Integrin Pathway	9 (570)
13.41 SuperPath: NF-kappaB Signaling	7 (327)
13.35 SuperPath: GPCR Pathway	10 (712)
13.32 SuperPath: B Heme Biosynthesis From Glycine	3 (27)
13.32 SuperPath: Kynurenine Pathway and Links to Cell Senescence	3 (27)
13.32 SuperPath: Ponatinib Pathway, Pharmacokinetics/Pharmacodynamics	3 (27)
13.18 SuperPath: Acute Viral Myocarditis	4 (75)
13.17 SuperPath: Neuropathic Pain-Signaling in Dorsal Horn Neurons	6 (232)
13.16 SuperPath: Reelin Signaling Pathway	3 (28)
13.16 SuperPath: Prostaglandin Signaling	3 (28)
13.16 SuperPath: Selective Serotonin Reuptake Inhibitor Pathway, Pharmacodynamics	3 (28)
13.16 SuperPath: Anti-diabetic Drug Potassium Channel Inhibitors Pathway, Pharmacodynamics	3 (28)
13.09 SuperPath: Immune Response CCR3 Signaling in Eosinophils	5 (146)
13.01 SuperPath: Amb2 Integrin Signaling	3 (29)
13.01 SuperPath: NNOS Signaling at Neuronal Synapses	3 (29)
12.99 SuperPath: Regulation of Expression of SLITs and ROBOs	8 (462)
12.95 SuperPath: CNTF Signaling	5 (149)
12.86 SuperPath: Integrated Breast Cancer Pathway	5 (151)
12.82 SuperPath: NF-kappaB Pathway	5 (152)
12.75 SuperPath: MAPK Signaling Pathway	6 (245)

12.73 SuperPath: Statin Inhibition of Cholesterol Production	3 (31)
12.73 SuperPath: Ethanol Effects on Histone Modifications	3 (31)
12.73 SuperPath: Osteopontin-mediated Events	3 (31)
12.73 SuperPath: Syndecan-4-mediated Signaling Events	3 (31)
12.73 SuperPath: Antiviral and Anti-inflammatory Effects of Nrf2 on SARS-CoV-2 Pathway	3 (31)
12.6 SuperPath: Inflammasomes	3 (32)
12.6 SuperPath: A-beta Uptake and Degradation	3 (32)
12.56 SuperPath: IL-1 Family Signaling Pathways	5 (158)
12.55 SuperPath: Fc-GammaR Pathway	4 (84)
12.43 SuperPath: MicroRNA Network Associated With Chronic Lymphocytic Leukemia	2 (6)
12.43 SuperPath: Venlafaxine Pathway, Pharmacokinetics	2 (6)
12.43 SuperPath: LncRNA-mediated Mechanisms of Therapeutic Resistance	2 (6)
12.3 SuperPath: Platelet Homeostasis	4 (88)
12.3 SuperPath: MAPK Pathway	4 (88)
12.24 SuperPath: Angiogenesis (CST)	4 (89)
12.22 SuperPath: Nuclear Receptors in Lipid Metabolism and Toxicity	3 (35)
12.22 SuperPath: Validated Transcriptional Targets of AP1 Family Members Fra1 and Fra2	3 (35)
12.2 SuperPath: Regulation of Activated PAK-2p34 By Proteasome Mediated Degradation	11 (943)
12.07 SuperPath: TNF Superfamily - Human Ligand-Receptor Interactions and Their Associated Functions	5 (170)
11.98 SuperPath: Type II Interferon Signaling	3 (37)
11.98 SuperPath: Photodynamic Therapy-induced HIF-1 Survival Signaling	3 (37)
11.86 SuperPath: MAPK-Erk Pathway	6 (275)
11.83 SuperPath: TGF-beta Signaling Pathways	4 (96)
11.82 SuperPath: P70S6K Signaling	7 (392)
11.8 SuperPath: Sertoli-Sertoli Cell Junction Dynamics	7 (393)
11.76 SuperPath: Urokinase-type Plasminogen Activator (uPA) and UPAR-mediated Signaling	3 (39)
11.76 SuperPath: Immune Infiltration in Pancreatic Cancer	3 (39)
11.66 SuperPath: Bladder Cancer	3 (40)
11.66 SuperPath: Unblocking of NMDA Receptors, Glutamate Binding and Activation	3 (40)
11.61 SuperPath: Glycolysis in Senescence	2 (8)
11.55 SuperPath: Common Pathways Underlying Drug Addiction	3 (41)
11.55 SuperPath: GPCRs, Other	4 (101)

11.5 SuperPath: DNA Damage Response (only ATM Dependent)	4 (102)
11.5 SuperPath: Akt Signaling	9 (682)
11.45 SuperPath: Clomipramine Pathway, Pharmacokinetics	3 (42)
11.45 SuperPath: L-citrulline Metabolism	3 (42)
11.35 SuperPath: Signaling By SCF-KIT	3 (43)
11.35 SuperPath: Mechanisms of CFTR Activation By S-nitrosoglutathione (normal and CF)	3 (43)
11.34 SuperPath: Senescence and Autophagy in Cancer	4 (105)
11.34 SuperPath: TNFR1 Pathway	5 (190)
11.32 SuperPath: ERK Signaling	12 (1185)
11.31 SuperPath: Metabolism of Water-soluble Vitamins and Cofactors	5 (191)
11.26 SuperPath: Signal Transduction_JNK Pathway	3 (44)
11.21 SuperPath: Metabolism of Steroids	5 (194)
11.19 SuperPath: G-protein Signaling RAC1 in Cellular Process	4 (108)
11.16 SuperPath: Transcription_Role of VDR in Regulation of Genes Involved in Osteoporosis	3 (45)
11.07 SuperPath: Nonalcoholic Fatty Liver Disease	3 (46)
10.99 SuperPath: Gastrin Signaling Pathway	4 (112)
10.98 SuperPath: Statin Pathway - Generalized, Pharmacokinetics	3 (47)
10.98 SuperPath: Nicotine Pathway (Dopaminergic Neuron), Pharmacodynamics	3 (47)
10.98 SuperPath: Interleukin-10 Signaling	3 (47)
10.98 SuperPath: Glutathione Conjugation	3 (47)
10.97 SuperPath: Aspirin and MiRNAs	2 (10)
10.97 SuperPath: Vinka Alkaloid Pathway, Pharmacokinetics	2 (10)
10.97 SuperPath: Mammary Gland Development Pathway - Involution (Stage 4 of 4)	2 (10)
10.8 SuperPath: T-cell Activation SARS-CoV-2	4 (116)
10.71 SuperPath: Calmodulin Induced Events	4 (118)
10.7 SuperPath: Neuroinflammation	2 (11)
10.69 SuperPath: G-protein Signaling G-Protein Alpha-i Signaling Cascades	5 (210)
10.67 SuperPath: Death Receptor Signaling Pathway	4 (119)
10.64 SuperPath: Activation of NF-KappaB By PKR	3 (51)
10.64 SuperPath: Non-genomic Actions of 1,25 Dihydroxyvitamin D3	3 (51)
10.6 SuperPath: Programmed Cell Death	5 (213)
10.53 SuperPath: Drug ADME	4 (122)

10.45 SuperPath: Cell-type Dependent Selectivity of CCK2R Signaling	2 (12)
10.45 SuperPath: Methionine Degradation	2 (12)
10.33 SuperPath: MTOR Signalling	3 (55)
10.32 SuperPath: Immune Response CD16 Signaling in NK Cells	4 (127)
10.25 SuperPath: Matrix Metalloproteinases	3 (56)
10.25 SuperPath: Development Angiotensin Activation of ERK	5 (225)
10.25 SuperPath: RAC1 GTPase Cycle	5 (225)
10.24 SuperPath: Ebola Virus Infection in Host	4 (129)
10.18 SuperPath: CXCR4-mediated Signaling Events	3 (57)
10.16 SuperPath: Autophagy Pathway	5 (228)
10.15 SuperPath: 22q11.2 Copy Number Variation Syndrome	4 (131)
10.11 SuperPath: MTOR Pathway	3 (58)
10.11 SuperPath: Celecoxib Pathway, Pharmacodynamics	3 (58)
10.01 SuperPath: Trans-sulfuration Pathway	2 (14)
10.01 SuperPath: S1P1 Pathway	2 (14)
9.99 SuperPath: RAC2 GTPase Cycle	4 (135)
9.97 SuperPath: IL27-mediated Signaling Events	3 (60)
9.89 SuperPath: TCR Signaling (Qiagen)	5 (238)
9.84 SuperPath: Cellular Responses to Stimuli	9 (802)
9.83 SuperPath: MiRNA Role in Immune Response in Sepsis	3 (62)
9.83 SuperPath: Inhibitory Action of Lipoxins on Superoxide Production in Neutrophils	3 (62)
9.82 SuperPath: Quercetin and Nf-kB / AP-1 Induced Apoptosis	2 (15)
9.82 SuperPath: Lamotrigine Pathway, Pharmacokinetics and Pharmacodynamics	2 (15)

<Banhasasim-tang Superpath>

Score	Name	# Matched Genes (Total Genes)
63.65	SuperPath: Methylphenidate Pathway, Pharmacodynamics	10 (18)
53	SuperPath: Neuroscience	18 (341)
48.25	SuperPath: Monoamine Transport	9 (33)
43.3	SuperPath: Interleukin-4 and Interleukin-13 Signaling	11 (108)
42.33	SuperPath: Spinal Cord Injury	11 (115)
42.18	SuperPath: Metabolism	31 (2121)
41.99	SuperPath: Immune Response IL-23 Signaling Pathway	12 (160)
41.99	SuperPath: Alzheimer's Disease and MiRNA Effects	14 (266)
40.68	SuperPath: Development Dopamine D2 Receptor Transactivation of EGFR	11 (128)
39.72	SuperPath: Signal Transduction	33 (2590)
39.46	SuperPath: Neurotransmitter Clearance	6 (10)
37.75	SuperPath: Burn Wound Healing	9 (75)
37.53	SuperPath: Transmission Across Chemical Synapses	15 (410)
37.44	SuperPath: Photodynamic Therapy-induced NF-kB Survival Signaling	8 (48)
34.52	SuperPath: Neuroinflammation and Glutamatergic Signaling	10 (140)
33.89	SuperPath: MIF Mediated Glucocorticoid Regulation	17 (681)
33.5	SuperPath: Biogenic Amine Synthesis	6 (20)
29.93	SuperPath: ATF-2 Transcription Factor Network	7 (57)
29.8	SuperPath: GPCR Downstream Signalling	16 (710)
29.28	SuperPath: Development VEGF Signaling Via VEGFR2 - Generic Cascades	9 (147)
29.05	SuperPath: Toll Comparative Pathway	8 (101)
28.71	SuperPath: ACE Inhibitor Pathway, Pharmacodynamics	6 (35)
28.36	SuperPath: G-Beta Gamma Signaling	10 (219)
28.31	SuperPath: Sudden Infant Death Syndrome (SIDS) Susceptibility Pathways	9 (159)
27.85	SuperPath: Colorectal Cancer Metastasis	9 (165)
27.61	SuperPath: Hepatocyte Growth Factor Receptor Signaling	8 (115)
26.96	SuperPath: Monoamine GPCRs	6 (43)
26.96	SuperPath: Insulin Receptor Recycling	7 (77)
26.77	SuperPath: NO/cGMP/PKG Mediated Neuroprotection	6 (44)

25.96 SuperPath: Signaling By Receptor Tyrosine Kinases	13 (524)
25.83 SuperPath: Development Ligand-independent Activation of ESR1 and ESR2	8 (135)
25.68 SuperPath: IL-18 Signaling Pathway	6 (50)
25.58 SuperPath: Plasma Membrane Estrogen Receptor Signaling	5 (24)
25.22 SuperPath: Amino Acid Metabolism	7 (92)
24.8 SuperPath: Toll-like Receptor Signaling Pathway	10 (285)
24.48 SuperPath: Apoptosis and Survival_Anti-apoptotic Action of Nuclear ESR1 and ESR2	5 (28)
24.48 SuperPath: Doxorubicin Pathway, Pharmacokinetics	5 (28)
24.03 SuperPath: Blood-Brain Barrier and Immune Cell Transmigration: VCAM-1/CD106 Signaling	7 (104)
23.97 SuperPath: PI3K-Akt Signaling Pathway	11 (390)
23.72 SuperPath: Innate Immune System	23 (2024)
23.47 SuperPath: Nuclear Receptors Meta-pathway	10 (315)
23.46 SuperPath: Sympathetic Nerve Pathway (Pre- and Post- Ganglionic Junction)	4 (12)
23.27 SuperPath: Apoptotic Pathways in Synovial Fibroblasts	14 (731)
22.94 SuperPath: ADORA2B Mediated Anti-inflammatory Cytokines Production	11 (419)
22.9 SuperPath: IL-10 Pathway	5 (35)
22.73 SuperPath: Fragile X Syndrome	7 (119)
22.7 SuperPath: Genetic Causes of Porto-sinusoidal Vascular Disease	5 (36)
22.7 SuperPath: Amyotrophic Lateral Sclerosis (ALS)	5 (36)
22.58 SuperPath: RXR and RAR Heterodimerization With Other Nuclear Receptor	4 (14)
22.18 SuperPath: Etoposide Pathway, Pharmacokinetics/Pharmacodynamics	4 (15)
22.17 SuperPath: Ca, CAMP and Lipid Signaling	7 (126)
21.95 SuperPath: Bladder Cancer	5 (40)
21.81 SuperPath: LDL Oxidation in Atherogenesis	4 (16)
21.81 SuperPath: Ethanol Degradation II	4 (16)
21.73 SuperPath: GDNF Signaling	7 (132)
21.65 SuperPath: Toll-Like Receptor Signaling Pathways	7 (133)
21.14 SuperPath: Tyrosine Metabolism P.1 (dopamine)	4 (18)
20.83 SuperPath: Overview of Nanoparticle Effects	4 (19)
20.83 SuperPath: Cellular Roles of Anthrax Toxin	4 (19)
20.76 SuperPath: Immune Response CCR3 Signaling in Eosinophils	7 (146)
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20.32 SuperPath: Glucose / Energy Metabolism	9 (307)
20.31 SuperPath: AMPK Enzyme Complex Pathway	7 (153)
20.26 SuperPath: Sildenafil Treatment	4 (21)
20.24 SuperPath: Non-genomic Actions of 1,25 Dihydroxyvitamin D3	5 (51)
20.24 SuperPath: PIP3 Activates AKT Signaling	9 (309)
20.13 SuperPath: Dopamine-DARPP32 Feedback Onto CAMP Pathway	8 (228)
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20.1 SuperPath: Phosphodiesterases in Neuronal Function	5 (52)
20.1 SuperPath: Netrin-UNC5B Signaling Pathway	5 (52)
20 SuperPath: Nitric Oxide Stimulates Guanylate Cyclase	4 (22)
19.95 SuperPath: AMP-activated Protein Kinase Signaling	6 (99)
19.74 SuperPath: A-beta Plaque Formation and APP Metabolism	4 (23)
19.71 SuperPath: Hepatitis C and Hepatocellular Carcinoma	5 (55)
19.58 SuperPath: Prostaglandin Synthesis and Regulation	5 (56)
19.5 SuperPath: G-protein Signaling_Rac2 Regulation Pathway	4 (24)
19.5 SuperPath: RHO GTPases Activate NADPH Oxidases	4 (24)
19.46 SuperPath: Senescence and Autophagy in Cancer	6 (105)
19.37 SuperPath: IL-9 Signaling Pathways	7 (169)
19.27 SuperPath: Pathogenesis of ALS	4 (25)
19.23 SuperPath: Signaling By VEGF	6 (108)
19.05 SuperPath: Alpha-synuclein Signaling	4 (26)
18.97 SuperPath: Class A/1 (Rhodopsin-like Receptors)	11 (556)
18.87 SuperPath: Inhibitory Action of Lipoxins on Superoxide Production in Neutrophils	5 (62)
18.63 SuperPath: Prostaglandin Signaling	4 (28)
18.63 SuperPath: Integrin Pathway	11 (570)
18.5 SuperPath: FMLP Pathway	8 (266)
18.46 SuperPath: Glycolysis in Senescence	3 (8)
18.33 SuperPath: One-carbon Metabolism and Related Pathways	5 (67)
18.23 SuperPath: N-cadherin Signaling Events	4 (30)
18.13 SuperPath: AP-1 Transcription Factor Network	5 (69)

18.05 SuperPath: CAMKK2 Pathway	4 (31)
17.96 SuperPath: Folate-alcohol and Cancer Pathway Hypotheses	3 (9)
17.74 SuperPath: Endometrial Cancer	7 (201)
17.69 SuperPath: Signaling Mediated By P38-alpha and P38-beta	4 (33)
17.55 SuperPath: Acute Viral Myocarditis	5 (75)
17.53 SuperPath: Methotrexate Pathway (Cancer Cell), Pharmacodynamics and Pharmacokinetics	4 (34)
17.53 SuperPath: Thromboxane A2 Receptor Signaling	4 (34)
17.53 SuperPath: Vitamin D-sensitive Calcium Signaling in Depression	4 (34)
17.46 SuperPath: Response to Elevated Platelet Cytosolic Ca <sup>2+</sup>	11 (621)
17.4 SuperPath: PI5P, PP2A and IER3 Regulate PI3K/AKT Signaling	6 (135)
17.33 SuperPath: G-protein Signaling G-Protein Alpha-i Signaling Cascades	7 (210)
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17.16 SuperPath: MTOR Signaling	6 (139)
17.05 SuperPath: Photodynamic Therapy-induced HIF-1 Survival Signaling	4 (37)
17.05 SuperPath: Detoxification of Reactive Oxygen Species	4 (37)
16.8 SuperPath: CREB Pathway	10 (529)
16.75 SuperPath: Immune Infiltration in Pancreatic Cancer	4 (39)
16.49 SuperPath: Integrated Breast Cancer Pathway	6 (151)
16.49 SuperPath: Regulation of Activated PAK-2p34 By Proteasome Mediated Degradation	13 (943)
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16.38 SuperPath: Dopamine Metabolism	3 (13)
16.36 SuperPath: Prolactin Signaling	9 (432)
16.21 SuperPath: Corticotropin-releasing Hormone Signaling Pathway	5 (91)
16.2 SuperPath: Fibrin Complement Receptor 3 Signaling Pathway	4 (43)
16.16 SuperPath: Beta-Adrenergic Signaling	8 (333)
16.12 SuperPath: IL-1 Family Signaling Pathways	6 (158)
16.07 SuperPath: Immune Response_Role of Integrins in NK Cells Cytotoxicity	4 (44)
15.84 SuperPath: Small Cell Lung Cancer	5 (96)
15.84 SuperPath: TGF-beta Signaling Pathways	5 (96)
15.7 SuperPath: Interleukin-10 Signaling	4 (47)

15.7 SuperPath: LPA Receptor Mediated Events	4 (47)
15.68 SuperPath: Beta-2 Adrenergic-dependent CFTR Expression	6 (167)
15.63 SuperPath: GPCR Pathway	11 (712)
15.6 SuperPath: Regulation of Expression of SLITs and ROBOs	9 (462)
15.55 SuperPath: Ascorbate Recycling (cytosolic)	2 (2)
15.53 SuperPath: TNF Superfamily - Human Ligand-Receptor Interactions and Their Associated Functions	6 (170)
15.49 SuperPath: SREBF and MiR33 in Cholesterol and Lipid Homeostasis	3 (16)
15.43 SuperPath: DNA Damage Response (only ATM Dependent)	5 (102)
15.19 SuperPath: ERK Signaling	14 (1185)
15.04 SuperPath: IL-17 Family Signaling Pathways	5 (108)
14.85 SuperPath: MAPK-Erk Pathway	7 (275)
14.79 SuperPath: Gastrin Signaling Pathway	5 (112)
14.76 SuperPath: Angiogenesis (WikiPathways)	3 (19)
14.72 SuperPath: LT-BetaR Pathway	4 (56)
14.64 SuperPath: TNFR1 Pathway	6 (190)
14.63 SuperPath: Microglia Pathogen Phagocytosis Pathway	4 (57)
14.55 SuperPath: T-cell Activation SARS-CoV-2	5 (116)
14.54 SuperPath: Antipsychotics Pathway (Metabolic Side Effects), Pharmacodynamics	3 (20)
14.49 SuperPath: P70S6K Signaling	8 (392)
14.47 SuperPath: Sertoli-Sertoli Cell Junction Dynamics	8 (393)
14.43 SuperPath: Calmodulin Induced Events	5 (118)
14.39 SuperPath: Defective SLC6A3 Causes Parkinsonism-dystonia Infantile (PKDYS)	2 (3)
14.38 SuperPath: Death Receptor Signaling Pathway	5 (119)
14.33 SuperPath: PKC-gamma Calcium Signaling Pathway in Ataxia	3 (21)
14.28 SuperPath: Nuclear Events Mediated By NFE2L2	6 (199)
14.25 SuperPath: P75(NTR)-mediated Signaling	4 (61)
14.18 SuperPath: Metapathway Biotransformation Phase I and II	7 (296)
14.16 SuperPath: IL 10 Signaling Pathway	4 (62)
14.16 SuperPath: Transcriptional Regulation By MECP2	4 (62)
14.16 SuperPath: MiRNA Role in Immune Response in Sepsis	4 (62)
14.13 SuperPath: Unfolded Protein Response	3 (22)
14.13 SuperPath: Inhibition of Ribosome Biogenesis By P14(ARF)	3 (22)

14.13 SuperPath: Roles of Ceramides in Development of Insulin Resistance	3 (22)
14.13 SuperPath: Type II Diabetes Mellitus	3 (22)
14.07 SuperPath: Lung Fibrosis	4 (63)
13.99 SuperPath: Nanog in Mammalian ESC Pluripotency	9 (534)
13.98 SuperPath: Ferroptosis	4 (64)
13.94 SuperPath: Sympathetic Nerve Pathway (Neuroeffector Junction)	3 (23)
13.94 SuperPath: Epstein-Barr Virus LMP1 Signaling	3 (23)
13.94 SuperPath: Estrogen Signaling Pathway	3 (23)
13.94 SuperPath: MNAR-PELP1 and Estrogen Receptor Interaction	3 (23)
13.94 SuperPath: Immune Response CD16 Signaling in NK Cells	5 (127)
13.83 SuperPath: Ebola Virus Infection in Host	5 (129)
13.76 SuperPath: Doxorubicin Pathway (Cardiomyocyte Cell), Pharmacodynamics	3 (24)
13.71 SuperPath: Akt Signaling	10 (682)
13.67 SuperPath: Myometrial Relaxation and Contraction Pathways	6 (215)
13.65 SuperPath: Neurophysiological Process Glutamate Regulation of Dopamine D1A Receptor Signaling	4 (68)
13.64 SuperPath: PAK Pathway	10 (686)
13.59 SuperPath: Alpha9 Beta1 Integrin Signaling Events	3 (25)
13.56 SuperPath: Aromatase Inhibitor Pathway (Breast Cell), Pharmacodynamics	2 (4)
13.56 SuperPath: Cells and Molecules Involved in Local Acute Inflammatory Response	2 (4)
13.49 SuperPath: Development EGFR Signaling Via Small GTPases	4 (70)
13.49 SuperPath: CCR5 Pathway in Macrophages	7 (320)
13.31 SuperPath: Development Angiotensin Activation of ERK	6 (225)
13.26 SuperPath: Kynurenine Pathway and Links to Cell Senescence	3 (27)
13.26 SuperPath: Response of Mtb to Phagocytosis	3 (27)
13.11 SuperPath: Selective Serotonin Reuptake Inhibitor Pathway, Pharmacodynamics	3 (28)
13.11 SuperPath: Anti-diabetic Drug Potassium Channel Inhibitors Pathway, Pharmacodynamics	3 (28)
12.96 SuperPath: NNOS Signaling at Neuronal Synapses	3 (29)
12.96 SuperPath: Amb2 Integrin Signaling	3 (29)
12.87 SuperPath: TCR Signaling (Qiagen)	6 (238)
12.86 SuperPath: CNTF Signaling	5 (149)
12.8 SuperPath: Infectious Disease	16 (1747)
12.73 SuperPath: NF-kappaB Pathway	5 (152)

12.68 SuperPath: Ethanol Effects on Histone Modifications	3 (31)
12.68 SuperPath: Osteopontin-mediated Events	3 (31)
12.68 SuperPath: IL8- and CXCR2-mediated Signaling Events	3 (31)
12.68 SuperPath: Antiviral and Anti-inflammatory Effects of Nrf2 on SARS-CoV-2 Pathway	3 (31)
12.68 SuperPath: Syndecan-4-mediated Signaling Events	3 (31)
12.68 SuperPath: Statin Inhibition of Cholesterol Production	3 (31)
12.65 SuperPath: MAPK Signaling Pathway	6 (245)
12.64 SuperPath: Development EGFR Signaling Pathway	5 (154)
12.54 SuperPath: A-beta Uptake and Degradation	3 (32)
12.48 SuperPath: Fc-GammaR Pathway	4 (84)
12.48 SuperPath: BAFF in B-Cell Signaling	4 (84)
12.41 SuperPath: Apoptosis and Survival_Regulation of Apoptosis By Mitochondrial Proteins	3 (33)
12.41 SuperPath: Oxidative Stress Response	3 (33)
12.4 SuperPath: MicroRNA Network Associated With Chronic Lymphocytic Leukemia	2 (6)
12.4 SuperPath: Venlafaxine Pathway, Pharmacokinetics	2 (6)
12.4 SuperPath: LncRNA-mediated Mechanisms of Therapeutic Resistance	2 (6)
12.36 SuperPath: Regulation of Actin Dynamics For Phagocytic Cup Formation	4 (86)
12.29 SuperPath: Development A2A Receptor Signaling	4 (87)
12.29 SuperPath: NGF Pathway	4 (87)
12.23 SuperPath: MAPK Pathway	4 (88)
12.23 SuperPath: Platelet Homeostasis	4 (88)
12.17 SuperPath: Nuclear Receptors in Lipid Metabolism and Toxicity	3 (35)
12.17 SuperPath: Validated Transcriptional Targets of AP1 Family Members Fra1 and Fra2	3 (35)
12.17 SuperPath: Peptide Hormone Metabolism	4 (89)
11.99 SuperPath: PI3K / Akt Signaling	4 (92)
11.93 SuperPath: Type II Interferon Signaling	3 (37)
11.93 SuperPath: Allograft Rejection	4 (93)
11.93 SuperPath: Ceramide Pathway	4 (93)
11.87 SuperPath: 4-1BB Pathway	5 (173)
11.82 SuperPath: Parkinson's Disease Pathway	3 (38)
11.82 SuperPath: TGF-Beta Pathway	9 (653)
11.82 SuperPath: Cellular Responses to Stimuli	10 (802)

11.76 SuperPath: CCL18 Signaling Pathway	4 (96)
11.71 SuperPath: Urokinase-type Plasminogen Activator (uPA) and UPAR-mediated Signaling	3 (39)
11.6 SuperPath: Cytoskeleton Remodeling Role of PDGFs in Cell Migration	3 (40)
11.6 SuperPath: Unblocking of NMDA Receptors, Glutamate Binding and Activation	3 (40)
11.53 SuperPath: GDNF-Family Ligands and Receptor Interactions	4 (100)
11.51 SuperPath: Translation Insulin Regulation of Translation	5 (183)
11.48 SuperPath: GPCRs, Other	4 (101)
11.48 SuperPath: CCR3 Pathway in Eosinophils	4 (101)
11.4 SuperPath: Metabolic Reprogramming in Pancreatic Cancer	3 (42)
11.4 SuperPath: Clomipramine Pathway, Pharmacokinetics	3 (42)
11.4 SuperPath: L-citrulline Metabolism	3 (42)
11.3 SuperPath: Signaling By SCF-KIT	3 (43)
11.3 SuperPath: Mechanisms of CFTR Activation By S-nitrosoglutathione (normal and CF)	3 (43)
11.23 SuperPath: Metabolism of Water-soluble Vitamins and Cofactors	5 (191)
11.22 SuperPath: Development A3 Receptor Signaling	4 (106)
11.2 SuperPath: Interleukin-11 Signaling Pathway	3 (44)
11.2 SuperPath: Signal Transduction_JNK Pathway	3 (44)
11.12 SuperPath: G-protein Signaling RAC1 in Cellular Process	4 (108)
11.12 SuperPath: Metabolism of Steroids	5 (194)
11.11 SuperPath: Transcription_Role of VDR in Regulation of Genes Involved in Osteoporosis	3 (45)
11.02 SuperPath: Nonalcoholic Fatty Liver Disease	3 (46)
10.96 SuperPath: Breast Cancer Pathway	5 (199)
10.93 SuperPath: Arsenic Metabolism and Reactive Oxygen Species Generation	2 (10)
10.93 SuperPath: Aspirin and MiRNAs	2 (10)
10.93 SuperPath: Mammary Gland Development Pathway - Involution (Stage 4 of 4)	2 (10)
10.93 SuperPath: Vinka Alkaloid Pathway, Pharmacokinetics	2 (10)
10.93 SuperPath: Nicotine Pathway (Dopaminergic Neuron), Pharmacodynamics	3 (47)
10.93 SuperPath: Statin Pathway - Generalized, Pharmacokinetics	3 (47)
10.93 SuperPath: Glutathione Conjugation	3 (47)
10.92 SuperPath: MicroRNAs in Cardiomyocyte Hypertrophy	4 (112)
10.78 SuperPath: Development Endothelin-1/EDNRA Transactivation of EGFR	4 (115)
10.76 SuperPath: FCERI Mediated Ca <sup>2+</sup> Mobilization	3 (49)

10.66 SuperPath: Orexin Receptor Pathway	2 (11)
10.66 SuperPath: Neuroinflammation	2 (11)
10.6 SuperPath: L1CAM Interactions	4 (119)
10.59 SuperPath: Calcineurin-regulated NFAT-dependent Transcription in Lymphocytes	3 (51)
10.59 SuperPath: Synaptic Vesicle Pathway	3 (51)
10.59 SuperPath: Activation of NF-KappaB By PKR	3 (51)
10.52 SuperPath: Programmed Cell Death	5 (213)
10.47 SuperPath: NFAT and Cardiac Hypertrophy	6 (326)
10.46 SuperPath: Drug ADME	4 (122)
10.46 SuperPath: VEGF Pathway (Qiagen)	4 (122)
10.45 SuperPath: NF-kappaB Signaling	6 (327)
10.43 SuperPath: NRP1-triggered Signaling Pathways in Pancreatic Cancer	3 (53)
10.41 SuperPath: Methionine Degradation	2 (12)
10.41 SuperPath: MIF Action Through Endocytic Pathway	2 (12)
10.41 SuperPath: Cell-type Dependent Selectivity of CCK2R Signaling	2 (12)
10.35 SuperPath: Signaling Events Mediated By Focal Adhesion Kinase	3 (54)
10.35 SuperPath: HIF1Alpha Pathway	3 (54)
10.28 SuperPath: NF-kB (NFkB) Pathway	3 (55)
10.28 SuperPath: Intrinsic Pathway For Apoptosis	3 (55)
10.28 SuperPath: MTOR Signalling	3 (55)
10.2 SuperPath: Matrix Metalloproteinases	3 (56)
10.19 SuperPath: Osteopontin Signaling	2 (13)
10.17 SuperPath: Immune Response Fc Epsilon RI Pathway	4 (129)
10.17 SuperPath: RAC1 GTPase Cycle	5 (225)
10.13 SuperPath: CXCR4-mediated Signaling Events	3 (57)
10.09 SuperPath: 22q11.2 Copy Number Variation Syndrome	4 (131)
10.08 SuperPath: Autophagy Pathway	5 (228)
10.06 SuperPath: VEGF Pathway (Tocris)	3 (58)
10.06 SuperPath: MTOR Pathway	3 (58)
10.06 SuperPath: Celecoxib Pathway, Pharmacodynamics	3 (58)
9.98 SuperPath: S1P1 Pathway	2 (14)
9.98 SuperPath: Trans-sulfuration Pathway	2 (14)

9.97 SuperPath: Signaling By NTRKs	4 (134)
9.97 SuperPath: Development FGFR Signaling Pathway	4 (134)
9.93 SuperPath: RAC2 GTPase Cycle	4 (135)
9.92 SuperPath: IL27-mediated Signaling Events	3 (60)
9.88 SuperPath: Activation of CAMP-Dependent PKA	8 (632)



<YMJ Superpath>

Score	Name	# Matched Genes (Total Genes)
55.14	SuperPath: Methylphenidate Pathway, Pharmacodynamics	8 (18)
44.26	SuperPath: Neurotransmitter Clearance	6 (10)
43.86	SuperPath: Neuroscience	13 (341)
40.53	SuperPath: Transmission Across Chemical Synapses	13 (410)
34.6	SuperPath: GPCR Downstream Signalling	14 (710)
34.51	SuperPath: Signal Transduction	23 (2590)
33.97	SuperPath: Monoamine Transport	6 (33)
32.73	SuperPath: Development Dopamine D2 Receptor Transactivation of EGFR	8 (128)
31.7	SuperPath: Monoamine GPCRs	6 (43)
28.98	SuperPath: Alzheimer's Disease and MiRNA Effects	9 (266)
27.62	SuperPath: Ca, CAMP and Lipid Signaling	7 (126)
25.34	SuperPath: Sudden Infant Death Syndrome (SIDS) Susceptibility Pathways	7 (159)
25.12	SuperPath: Activation of NMDA Receptors and Postsynaptic Events	6 (93)
24.59	SuperPath: AMP-activated Protein Kinase Signaling	6 (99)
23.86	SuperPath: Interleukin-4 and Interleukin-13 Signaling	6 (108)
23.66	SuperPath: Biogenic Amine Synthesis	4 (20)
23.51	SuperPath: Class A/1 (Rhodopsin-like Receptors)	10 (556)
23.04	SuperPath: Fragile X Syndrome	6 (119)
22.17	SuperPath: GDNF Signaling	6 (132)
21.98	SuperPath: Development Ligand-independent Activation of ESR1 and ESR2	6 (135)
21.73	SuperPath: Apoptosis and Survival_Anti-apoptotic Action of Nuclear ESR1 and ESR2	4 (28)
21.27	SuperPath: Development VEGF Signaling Via VEGFR2 - Generic Cascades	6 (147)
20.47	SuperPath: Nanog in Mammalian ESC Pluripotency	9 (534)
20.46	SuperPath: ACE Inhibitor Pathway, Pharmacodynamics	4 (35)
20.21	SuperPath: Beta-2 Adrenergic-dependent CFTR Expression	6 (167)
20.11	SuperPath: IL-9 Signaling Pathways	6 (169)
19.56	SuperPath: Common Pathways Underlying Drug Addiction	4 (41)
18.76	SuperPath: Nuclear Receptors Meta-pathway	7 (315)
18.66	SuperPath: Photodynamic Therapy-induced NF-kB Survival Signaling	4 (48)
18.43	SuperPath: IL-18 Signaling Pathway	4 (50)
18.39	SuperPath: Hepatocyte Growth Factor Receptor Signaling	5 (115)

18.38 SuperPath: RXR and RAR Heterodimerization With Other Nuclear Receptor	3 (14)
18.31 SuperPath: G-protein Signaling G-Protein Alpha-i Signaling Cascades	6 (210)
18.23 SuperPath: Beta-Adrenergic Signaling	7 (333)
18.21 SuperPath: Phosphodiesterases in Neuronal Function	4 (52)
18.08 SuperPath: Etoposide Pathway, Pharmacokinetics/Pharmacodynamics	3 (15)
17.97 SuperPath: G-Beta Gamma Signaling	6 (219)
17.69 SuperPath: ATF-2 Transcription Factor Network	4 (57)
17.64 SuperPath: Dopamine-DARPP32 Feedback Onto CAMP Pathway	6 (228)
17.5 SuperPath: Neuropathic Pain-Signaling in Dorsal Horn Neurons	6 (232)
17.28 SuperPath: PI5P, PP2A and IER3 Regulate PI3K/AKT Signaling	5 (135)
17.27 SuperPath: Signaling By Receptor Tyrosine Kinases	8 (524)
17.21 SuperPath: Transcriptional Regulation By MECP2	4 (62)
17.17 SuperPath: CREB Pathway	8 (529)
17.07 SuperPath: Overview of Nanoparticle Effects	3 (19)
17.07 SuperPath: Cellular Roles of Anthrax Toxin	3 (19)
17.03 SuperPath: Neuroinflammation and Glutamatergic Signaling	5 (140)
16.71 SuperPath: P70S6K Signaling	7 (392)
16.69 SuperPath: Neurophysiological Process Glutamate Regulation of Dopamine D1A Receptor Signaling	4 (68)
16.44 SuperPath: Roles of Ceramides in Development of Insulin Resistance	3 (22)
16.41 SuperPath: AMPK Enzyme Complex Pathway	5 (153)
16.25 SuperPath: MNAR-PELP1 and Estrogen Receptor Interaction	3 (23)
16.25 SuperPath: Estrogen Signaling Pathway	3 (23)
16.14 SuperPath: Burn Wound Healing	4 (75)
16.1 SuperPath: Immune Response IL-23 Signaling Pathway	5 (160)
16.07 SuperPath: Plasma Membrane Estrogen Receptor Signaling	3 (24)
15.93 SuperPath: Defective SLC6A3 Causes Parkinsonism-dystonia Infantile (PKDYS)	2 (3)
15.89 SuperPath: Pathogenesis of ALS	3 (25)
15.56 SuperPath: Ponatinib Pathway, Pharmacokinetics/Pharmacodynamics	3 (27)
15.5 SuperPath: BAFF in B-Cell Signaling	4 (84)
15.41 SuperPath: Selective Serotonin Reuptake Inhibitor Pathway, Pharmacodynamics	3 (28)
15.41 SuperPath: Reelin Signaling Pathway	3 (28)
15.18 SuperPath: Peptide Hormone Metabolism	4 (89)
15.17 SuperPath: PIP3 Activates AKT Signaling	6 (309)
15.11 SuperPath: N-cadherin Signaling Events	3 (30)

15.1 SuperPath: Aromatase Inhibitor Pathway (Breast Cell), Pharmacodynamics	2 (4)
14.93 SuperPath: Ceramide Pathway	4 (93)
14.78 SuperPath: Metabolism of Steroids	5 (194)
14.76 SuperPath: TGF-beta Signaling Pathways	4 (96)
14.58 SuperPath: Vitamin D-sensitive Calcium Signaling in Depression	3 (34)
14.54 SuperPath: Endometrial Cancer	5 (201)
14.53 SuperPath: GDNF-Family Ligands and Receptor Interactions	4 (100)
14.47 SuperPath: GPCRs, Other	4 (101)
14.22 SuperPath: LKB1 Signaling Events	3 (37)
13.94 SuperPath: Venlafaxine Pathway, Pharmacokinetics	2 (6)
13.9 SuperPath: Gastrin Signaling Pathway	4 (112)
13.89 SuperPath: Unblocking of NMDA Receptors, Glutamate Binding and Activation	3 (40)
13.85 SuperPath: Apoptotic Pathways in Synovial Fibroblasts	8 (731)
13.71 SuperPath: T-cell Activation SARS-CoV-2	4 (116)
13.61 SuperPath: Calmodulin Induced Events	4 (118)
13.48 SuperPath: NO/cGMP/PKG Mediated Neuroprotection	3 (44)
13.48 SuperPath: Interleukin-11 Signaling Pathway	3 (44)
13.29 SuperPath: Nonalcoholic Fatty Liver Disease	3 (46)
13.2 SuperPath: Statin Pathway - Generalized, Pharmacokinetics	3 (47)
13.2 SuperPath: Immune Response CD16 Signaling in NK Cells	4 (127)
13 SuperPath: Metabolism	13 (2121)
12.95 SuperPath: Gene Expression (Transcription)	11 (1546)
12.86 SuperPath: Non-genomic Actions of 1,25 Dihydroxyvitamin D3	3 (51)
12.77 SuperPath: Netrin-UNC5B Signaling Pathway	3 (52)
12.71 SuperPath: MTOR Signaling	4 (139)
12.65 SuperPath: FMLP Pathway	5 (266)
12.47 SuperPath: Vinka Alkaloid Pathway, Pharmacokinetics	2 (10)
12.46 SuperPath: LT-BetaR Pathway	3 (56)
12.43 SuperPath: MAPK-Erk Pathway	5 (275)
12.33 SuperPath: CNTF Signaling	4 (149)
12.25 SuperPath: Integrated Breast Cancer Pathway	4 (151)
12.2 SuperPath: Orexin Receptor Pathway	2 (11)
11.97 SuperPath: Nuclear Receptors	3 (63)
11.97 SuperPath: Immune Response_IFN Gamma Signaling Pathway	3 (63)

11.97 SuperPath: Autophagy	3 (63)
11.95 SuperPath: Cell-type Dependent Selectivity of CCK2R Signaling	2 (12)
11.95 SuperPath: Sympathetic Nerve Pathway (Pre- and Post- Ganglionic Junction)	2 (12)
11.95 SuperPath: Methionine Degradation	2 (12)
11.9 SuperPath: ESR-mediated Signaling	5 (298)
11.77 SuperPath: Colorectal Cancer Metastasis	4 (165)
11.72 SuperPath: MIF Mediated Glucocorticoid Regulation	7 (681)
11.7 SuperPath: Glucose / Energy Metabolism	5 (307)
11.61 SuperPath: TNF Superfamily - Human Ligand-Receptor Interactions and Their Associated Functions	4 (170)
11.52 SuperPath: Development EGFR Signaling Via Small GTPases	3 (70)
11.52 SuperPath: Signaling By ERBB4	3 (70)
11.34 SuperPath: GPCR Pathway	7 (712)
11.31 SuperPath: Methionine Metabolism	2 (15)
11.31 SuperPath: Lamotrigine Pathway, Pharmacokinetics and Pharmacodynamics	2 (15)
11.29 SuperPath: Translation Translation Regulation By Alpha-1 Adrenergic Receptors	3 (74)
11.23 SuperPath: Development EPO-induced Jak-STAT Pathway	3 (75)
11.23 SuperPath: Acute Viral Myocarditis	3 (75)
11.21 SuperPath: Translation Insulin Regulation of Translation	4 (183)
11.12 SuperPath: Ethanol Degradation II	2 (16)
11.12 SuperPath: LDL Oxidation in Atherogenesis	2 (16)
11.12 SuperPath: SREBF and MiR33 in Cholesterol and Lipid Homeostasis	2 (16)
11.12 SuperPath: Cytokine Signaling in Immune System	7 (730)
11.01 SuperPath: TNFR1 Pathway	4 (190)
10.95 SuperPath: Drug Induction of Bile Acid Pathway	2 (17)
10.79 SuperPath: Tyrosine Metabolism P.1 (dopamine)	2 (18)
10.79 SuperPath: Nongenotropic Androgen Signaling	2 (18)
10.76 SuperPath: Breast Cancer Pathway	4 (199)
10.66 SuperPath: Regulation of Actin Dynamics For Phagocytic Cup Formation	3 (86)
10.61 SuperPath: Insulin Receptor Signalling Cascade	3 (87)
10.61 SuperPath: Development A2A Receptor Signaling	3 (87)
10.49 SuperPath: Cannabinoid Receptor Signaling	2 (20)
10.49 SuperPath: Hematopoietic Stem Cell Gene Regulation By GABP Alpha/beta Complex	2 (20)
10.49 SuperPath: Thyroxine (thyroid Hormone) Production	2 (20)
10.49 SuperPath: Serotonin and Anxiety	2 (20)

10.49 SuperPath: Antipsychotics Pathway (Metabolic Side Effects), Pharmacodynamics	2 (20)
10.35 SuperPath: PKC-gamma Calcium Signaling Pathway in Ataxia	2 (21)
10.35 SuperPath: Host-pathogen Interaction of Human Coronaviruses - Apoptosis	2 (21)
10.35 SuperPath: MFAP5 Effect on Permeability and Motility of Endothelial Cells Via Cytoskeleton Rearrangement	2 (21)
10.35 SuperPath: MTHFR Deficiency	2 (21)
10.22 SuperPath: Type II Diabetes Mellitus	2 (22)
10.21 SuperPath: CCL18 Signaling Pathway	3 (96)
10.21 SuperPath: Small Cell Lung Cancer	3 (96)
10.15 SuperPath: PI3K-Akt Signaling Pathway	5 (390)
10.1 SuperPath: Development Angiotensin Activation of ERK	4 (225)
10.09 SuperPath: A-beta Plaque Formation and APP Metabolism	2 (23)
10.09 SuperPath: Epstein-Barr Virus LMP1 Signaling	2 (23)
10.09 SuperPath: Gemtuzumab Ozogamicin Pathway, Pharmacokinetics/Pharmacodynamics	2 (23)
10.09 SuperPath: Sympathetic Nerve Pathway (Neuroeffector Junction)	2 (23)
10.08 SuperPath: Immune Response Antigen Presentation By MHC Class II	3 (99)
10.03 SuperPath: Autophagy Pathway	4 (228)
10 SuperPath: Toll Comparative Pathway	3 (101)
9.97 SuperPath: Signaling By Overexpressed Wild-Type EGFR in Cancer	2 (24)
9.97 SuperPath: Metabolism of Proteins	11 (1970)
9.96 SuperPath: DNA Damage Response (only ATM Dependent)	3 (102)
9.88 SuperPath: Blood-Brain Barrier and Immune Cell Transmigration: VCAM-1/CD106 Signaling	3 (104)
9.85 SuperPath: Role of Phospholipids in Phagocytosis	2 (25)
9.84 SuperPath: Senescence and Autophagy in Cancer	3 (105)
9.8 SuperPath: TCR Signaling (Qiagen)	4 (238)
9.78 SuperPath: Response to Elevated Platelet Cytosolic Ca <sup>2+</sup>	6 (621)
9.72 SuperPath: IL-17 Family Signaling Pathways	3 (108)
9.69 SuperPath: ADORA2B Mediated Anti-inflammatory Cytokines Production	5 (419)
9.63 SuperPath: Response of Mtb to Phagocytosis	2 (27)
9.63 SuperPath: IL-15 Signaling and Its Primary Biological Effects in Different Immune Cell Types	2 (27)

**<Common target Superpath>**

<b>Score</b>	<b>Name</b>	<b># Matched Genes (Total Genes)</b>
56.55	SuperPath: Methylphenidate Pathway, Pharmacodynamics	8 (18)
45.29	SuperPath: Neurotransmitter Clearance	6 (10)
36.48	SuperPath: Neuroscience	11 (341)
35.61	SuperPath: Signal Transduction	22 (2590)
34.99	SuperPath: Monoamine Transport	6 (33)
33.67	SuperPath: Transmission Across Chemical Synapses	11 (410)
33.06	SuperPath: GPCR Downstream Signalling	13 (710)
32.72	SuperPath: Monoamine GPCRs	6 (43)
28.81	SuperPath: Ca, CAMP and Lipid Signaling	7 (126)
28.65	SuperPath: Development Dopamine D2 Receptor Transactivation of EGFR	7 (128)
25.18	SuperPath: Class A/1 (Rhodopsin-like Receptors)	10 (556)
24.87	SuperPath: Interleukin-4 and Interleukin-13 Signaling	6 (108)
24.32	SuperPath: Biogenic Amine Synthesis	4 (20)
21.61	SuperPath: Sudden Infant Death Syndrome (SIDS) Susceptibility Pathways	6 (159)
21.51	SuperPath: Alzheimer's Disease and MiRNA Effects	7 (266)
21.2	SuperPath: Beta-2 Adrenergic-dependent CFTR Expression	6 (167)
19.9	SuperPath: Nuclear Receptors Meta-pathway	7 (315)
18.98	SuperPath: Fragile X Syndrome	5 (119)
18.88	SuperPath: RXR and RAR Heterodimerization With Other Nuclear Receptor	3 (14)
18.87	SuperPath: Phosphodiesterases in Neuronal Function	4 (52)
18.61	SuperPath: Dopamine-DARPP32 Feedback Onto CAMP Pathway	6 (228)
18.58	SuperPath: Etoposide Pathway, Pharmacokinetics/Pharmacodynamics	3 (15)
18.35	SuperPath: ATF-2 Transcription Factor Network	4 (57)
18.25	SuperPath: GDNF Signaling	5 (132)
18.1	SuperPath: Development Ligand-independent Activation of ESR1 and ESR2	5 (135)
17.87	SuperPath: Transcriptional Regulation By MECP2	4 (62)
17.56	SuperPath: Overview of Nanoparticle Effects	3 (19)
17.56	SuperPath: Cellular Roles of Anthrax Toxin	3 (19)
17.5	SuperPath: Development VEGF Signaling Via VEGFR2 - Generic Cascades	5 (147)

17.35 SuperPath: Neurophysiological Process Glutamate Regulation of Dopamine D1A Receptor Signaling	4 (68)
17.23 SuperPath: AMPK Enzyme Complex Pathway	5 (153)
16.93 SuperPath: Roles of Ceramides in Development of Insulin Resistance	3 (22)
16.79 SuperPath: Burn Wound Healing	4 (75)
16.56 SuperPath: Plasma Membrane Estrogen Receptor Signaling	3 (24)
16.54 SuperPath: IL-9 Signaling Pathways	5 (169)
16.39 SuperPath: Pathogenesis of ALS	3 (25)
16.26 SuperPath: Defective SLC6A3 Causes Parkinsonism-dystonia Infantile (PKDYS)	2 (3)
15.9 SuperPath: Selective Serotonin Reuptake Inhibitor Pathway, Pharmacodynamics	3 (28)
15.9 SuperPath: Apoptosis and Survival_Anti-apoptotic Action of Nuclear ESR1 and ESR2	3 (28)
15.83 SuperPath: Peptide Hormone Metabolism	4 (89)
15.6 SuperPath: N-cadherin Signaling Events	3 (30)
15.59 SuperPath: Metabolism of Steroids	5 (194)
15.58 SuperPath: Activation of NMDA Receptors and Postsynaptic Events	4 (93)
15.43 SuperPath: Aromatase Inhibitor Pathway (Breast Cell), Pharmacodynamics	2 (4)
15.23 SuperPath: AMP-activated Protein Kinase Signaling	4 (99)
15.13 SuperPath: Signaling By Receptor Tyrosine Kinases	7 (524)
15.12 SuperPath: GPCRs, Other	4 (101)
15.07 SuperPath: Vitamin D-sensitive Calcium Signaling in Depression	3 (34)
15.05 SuperPath: CREB Pathway	7 (529)
15.04 SuperPath: G-protein Signaling G-Protein Alpha-i Signaling Cascades	5 (210)
14.96 SuperPath: Nanog in Mammalian ESC Pluripotency	7 (534)
14.95 SuperPath: ACE Inhibitor Pathway, Pharmacodynamics	3 (35)
14.87 SuperPath: Metabolism	13 (2121)
14.76 SuperPath: G-Beta Gamma Signaling	5 (219)
14.4 SuperPath: Hepatocyte Growth Factor Receptor Signaling	4 (115)
14.38 SuperPath: Unblocking of NMDA Receptors, Glutamate Binding and Activation	3 (40)
14.37 SuperPath: Neuropathic Pain-Signaling in Dorsal Horn Neurons	5 (232)
14.27 SuperPath: Common Pathways Underlying Drug Addiction	3 (41)
14.26 SuperPath: Venlafaxine Pathway, Pharmacokinetics	2 (6)
14.22 SuperPath: P70S6K Signaling	6 (392)
13.97 SuperPath: NO/cGMP/PKG Mediated Neuroprotection	3 (44)

13.78 SuperPath: Nonalcoholic Fatty Liver Disease	3 (46)
13.69 SuperPath: Statin Pathway - Generalized, Pharmacokinetics	3 (47)
13.6 SuperPath: Photodynamic Therapy-induced NF-kB Survival Signaling	3 (48)
13.51 SuperPath: PI5P, PP2A and IER3 Regulate PI3K/AKT Signaling	4 (135)
13.43 SuperPath: IL-18 Signaling Pathway	3 (50)
13.31 SuperPath: Neuroinflammation and Glutamatergic Signaling	4 (140)
12.8 SuperPath: Vinka Alkaloid Pathway, Pharmacokinetics	2 (10)
12.57 SuperPath: Immune Response IL-23 Signaling Pathway	4 (160)
12.48 SuperPath: Glucose / Energy Metabolism	5 (307)
12.45 SuperPath: Nuclear Receptors	3 (63)
12.45 SuperPath: Autophagy	3 (63)
12.44 SuperPath: PIP3 Activates AKT Signaling	5 (309)
12.27 SuperPath: Methionine Degradation	2 (12)
12.27 SuperPath: Sympathetic Nerve Pathway (Pre- and Post- Ganglionic Junction)	2 (12)
12.27 SuperPath: Cell-type Dependent Selectivity of CCK2R Signaling	2 (12)
12.01 SuperPath: Signaling By ERBB4	3 (70)
11.94 SuperPath: Beta-Adrenergic Signaling	5 (333)
11.63 SuperPath: Lamotrigine Pathway, Pharmacokinetics and Pharmacodynamics	2 (15)
11.45 SuperPath: Ethanol Degradation II	2 (16)
11.45 SuperPath: LDL Oxidation in Atherogenesis	2 (16)
11.45 SuperPath: SREBF and MiR33 in Cholesterol and Lipid Homeostasis	2 (16)
11.33 SuperPath: Endometrial Cancer	4 (201)
11.28 SuperPath: Drug Induction of Bile Acid Pathway	2 (17)
11.24 SuperPath: BAFF in B-Cell Signaling	3 (84)
11.11 SuperPath: Tyrosine Metabolism P.1 (dopamine)	2 (18)
10.82 SuperPath: Ceramide Pathway	3 (93)
10.81 SuperPath: Antipsychotics Pathway (Metabolic Side Effects), Pharmacodynamics	2 (20)
10.81 SuperPath: Cannabinoid Receptor Signaling	2 (20)
10.81 SuperPath: Serotonin and Anxiety	2 (20)
10.68 SuperPath: TGF-beta Signaling Pathways	3 (96)
10.68 SuperPath: Small Cell Lung Cancer	3 (96)
10.67 SuperPath: Host-pathogen Interaction of Human Coronaviruses - Apoptosis	2 (21)



10.67 SuperPath: PKC-gamma Calcium Signaling Pathway in Ataxia	2 (21)
10.65 SuperPath: Autophagy Pathway	4 (228)
10.51 SuperPath: GDNF-Family Ligands and Receptor Interactions	3 (100)
10.41 SuperPath: A-beta Plaque Formation and APP Metabolism	2 (23)
10.41 SuperPath: Sympathetic Nerve Pathway (Neuroeffector Junction)	2 (23)
10.41 SuperPath: Gemtuzumab Ozogamicin Pathway, Pharmacokinetics/Pharmacodynamics	2 (23)
10.41 SuperPath: Estrogen Signaling Pathway	2 (23)
10.41 SuperPath: MNAR-PELP1 and Estrogen Receptor Interaction	2 (23)
10.35 SuperPath: Blood-Brain Barrier and Immune Cell Transmigration: VCAM-1/CD106 Signaling	3 (104)
10.18 SuperPath: Role of Phospholipids in Phagocytosis	2 (25)
9.96 SuperPath: IL-15 Signaling and Its Primary Biological Effects in Different Immune Cell Types	2 (27)
9.96 SuperPath: MIF Mediated Glucocorticoid Regulation	6 (681)
9.94 SuperPath: Gene Expression (Transcription)	9 (1546)
9.9 SuperPath: T-cell Activation SARS-CoV-2	3 (116)
9.85 SuperPath: Reelin Signaling Pathway	2 (28)
9.85 SuperPath: Synthesis of PC	2 (28)
9.85 SuperPath: Anti-diabetic Drug Potassium Channel Inhibitors Pathway, Pharmacodynamics	2 (28)
9.83 SuperPath: Calmodulin Induced Events	3 (118)
9.83 SuperPath: FMLP Pathway	4 (266)
9.75 SuperPath: Amb2 Integrin Signaling	2 (29)
9.75 SuperPath: NNOS Signaling at Neuronal Synapses	2 (29)
9.69 SuperPath: Drug ADME	3 (122)
9.66 SuperPath: Aryl Hydrocarbon Receptor Pathway	2 (30)
9.65 SuperPath: MAPK-Erk Pathway	4 (275)
9.64 SuperPath: GPCR Pathway	6 (712)
9.56 SuperPath: Statin Inhibition of Cholesterol Production	2 (31)
9.56 SuperPath: Trafficking of AMPA Receptors	2 (31)
9.53 SuperPath: Immune Response CD16 Signaling in NK Cells	3 (127)
9.47 SuperPath: Mammary Gland Development Pathway - Pregnancy and Lactation (Stage 3 of 4)	2 (32)
9.47 SuperPath: 14-3-3 and Regulation of BAD Activity	2 (32)
9.47 SuperPath: Antigen Activates B Cell Receptor (BCR) Leading to Generation of Second Messengers	2 (32)
9.45 SuperPath: Cytokine Signaling in Immune System	6 (730)

9.44 SuperPath: Apoptotic Pathways in Synovial Fibroblasts  
9.42 SuperPath: Metabolism of Proteins  
9.4 SuperPath: 22q11.2 Copy Number Variation Syndrome

6 (731)  
10 (1970)  
3 (131)

## Supplementary 3

<GGT Organs>

Name	Enrichment ratio	Observed	Expected	P-value	FDR	
peripheral nerves	2.381216833	51	21.41762115	1.71423E-12	2.14279E-10	↑
brain	1.656282414	68	41.05580029	8.78445E-12	5.49028E-10	↑
head	1.524664251	70	45.91174743	1.10935E-10	3.7322E-09	↑
heart	2.10362485	52	24.71923642	1.1943E-10	3.7322E-09	↑
spinal cord	2.509707691	41	16.33656388	6.78516E-10	1.41358E-08	↑
liver	2.410679004	43	17.83729809	6.16555E-10	1.41358E-08	↑
lung	2.246718784	46	20.4743025	8.03627E-10	1.43505E-08	↑
peripheral nervous system	1.930592181	53	27.45271659	2.0458E-09	3.19657E-08	↑
pancreas	3.080834585	25	8.114684288	2.22118E-07	3.08497E-06	↑
kidney	1.918064268	44	22.93979442	4.47199E-07	5.54253E-06	↑
bone marrow	2.853505238	26	9.111600587	4.87742E-07	5.54253E-06	↑
skin	1.661931622	53	31.89060206	6.84323E-07	7.12837E-06	↑
small intestine	2.625180698	28	10.66593245	7.47752E-07	7.18992E-06	↑
esophagus	2.662544528	27	10.14067548	1.0041E-06	8.96518E-06	↑
intestine	2.159436834	35	16.20792952	1.3768E-06	1.14733E-05	↑
blood vessels	1.71073948	49	28.64258443	1.62644E-06	1.2699E-05	↑
large intestine	2.278782809	32	14.04258443	1.72706E-06	1.2699E-05	↑
upper limb	1.857791461	42	22.60748899	2.81971E-06	1.95813E-05	↑
rectum	2.906981257	22	7.567988253	4.02079E-06	2.64525E-05	↑
stomach	2.253325392	30	13.31365639	5.68331E-06	3.55207E-05	↑
eye	1.659409465	46	27.72070485	1.43499E-05	8.5416E-05	↑
mouth	1.765140421	40	22.66108664	2.38823E-05	0.000135695	↑
lower limb	1.730676254	41	23.69016153	2.7582E-05	0.000149902	↑
spleen	2.707914985	20	7.385756241	3.47209E-05	0.000180838	↑
hand	1.811886528	37	20.42070485	3.68869E-05	0.000184435	↑
foot	1.776908023	38	21.38546256	4.09879E-05	0.000186925	↑

toes	1.864687889	35	18.76989721	3.92888E-05	0.000186925	↑
forearm	2.171350968	27	12.43465492	4.18713E-05	0.000186925	↑
arm	2.109898865	28	13.27077827	4.6505E-05	0.000200452	↑
digit	1.818276212	36	19.7989721	4.81994E-05	0.000200831	↑
wrist	2.049501868	29	14.14977974	5.34153E-05	0.000215384	↑
chest wall	2.091999272	27	12.90631424	7.93202E-05	0.000309845	↑
breast	2.245641033	24	10.68737151	8.21637E-05	0.000311226	↑
prostate	2.403731406	21	8.736417034	0.000109233	0.000401591	↑
coagulation system	2.256168705	23	10.19427313	0.000115131	0.000411184	↑
neck	1.84956969	32	17.30132159	0.000128351	0.000417344	↑
elbow	1.989379128	28	14.07474302	0.000130211	0.000417344	↑
shoulder	1.954727215	29	14.83582966	0.000125264	0.000417344	↑
red blood cells	2.249073835	23	10.22643172	0.000120569	0.000417344	↑
anus	3.035390604	15	4.941703377	0.000137158	0.000428618	↑
knee	1.949294623	28	14.36417034	0.000184279	0.00056071	↑
fingers	1.757219292	34	19.34875184	0.000188399	0.00056071	↑
ankle	1.934855403	28	14.47136564	0.000208953	0.000585936	↑
hip	1.934855403	28	14.47136564	0.000208953	0.000585936	↑
shin	2.060240089	25	12.13450808	0.000210937	0.000585936	↑
scapula	2.126478135	23	10.81600587	0.000270372	0.000732735	↑
thigh	2.024472032	25	12.34889868	0.000275508	0.000732735	↑
clavicle	2.043444227	23	11.25550661	0.000472241	0.001229793	
sternum	2.03568922	23	11.29838473	0.000497702	0.001269648	
humerus	2.014663322	23	11.41629956	0.00057406	0.00143515	
fibula	2.05438315	22	10.70881057	0.000612979	0.001499727	
rib	1.999642533	23	11.5020558	0.000635884	0.001499727	
rib cage	1.999642533	23	11.5020558	0.000635884	0.001499727	
tibia	2.027992853	22	10.84816446	0.000726302	0.001681255	
gallbladder	3.547059743	10	2.819236417	0.000800365	0.001819011	
spinal column	1.80556783	27	14.95374449	0.000857632	0.001887104	

vertebrae	1.837484433	26	14.14977974	0.000866972	0.001887104
urinary bladder	2.411312988	16	6.635389134	0.000875616	0.001887104
ulna	1.988690666	22	11.06255507	0.000936395	0.001983887
pelvis	1.808709509	26	14.37488987	0.001094242	0.002260444
meninges	2.575990922	14	5.434801762	0.001103097	0.002260444
radius	1.954598826	22	11.25550661	0.001168853	0.002356559
maxilla	1.70576448	29	17.00117474	0.001245312	0.002470858
mandible	1.695076733	29	17.10837004	0.001376221	0.002684974
white blood cells	1.623276498	32	19.71321586	0.001396186	0.002684974
femur	1.921656149	22	11.44845815	0.001449819	0.002745869
jaws	1.672028718	29	17.34419971	0.001707629	0.003185875
skull	1.514820101	36	23.76519824	0.002049734	0.003767894
face	1.563753525	32	20.46358297	0.002627691	0.004760309
abdominal wall	2.240184215	14	6.24948605	0.00367208	0.006557285
tongue	2.39199157	12	5.016740088	0.004607781	0.008112291
diaphragm	2.672999176	10	3.741116006	0.005075078	0.008810899
biliary tract	2.665362035	10	3.751835536	0.005165672	0.008845329
bronchus	2.650217933	10	3.773274596	0.0053506	0.009038176
adrenal gland	2.562848111	10	3.901908957	0.006569627	0.010949379
lymph nodes	2.541898399	10	3.934067548	0.006905161	0.011357172
blood	1.370843699	39	28.44963289	0.007775177	0.01262204
thymus	4.021020312	5	1.243465492	0.015213536	0.024380666
pharynx	1.883136221	13	6.903377386	0.018436816	0.029172177
testis	1.609950223	18	11.1804699	0.023045243	0.036008192
eyelid	1.566397465	18	11.49133627	0.029155271	0.044992702
cerebellum	1.48311083	20	13.48516887	0.035501591	0.054118278
cranial nerves	1.390692773	25	17.97665198	0.036947932	0.055644476
placenta	2.322514637	6	2.583406755	0.05013143	0.074600342
heart valve	2.092992624	7	3.344493392	0.051792473	0.075279758
salivary gland	2.30339929	6	2.604845815	0.051494388	0.075279758

sweat gland	1.943493151	8	4.116299559	0.052711044	0.075734258
uterus	1.560367261	14	8.972246696	0.053871159	0.076521533
thyroid	2.229984173	6	2.690602056	0.057158111	0.080278245
penis	1.561299937	12	7.685903084	0.071155597	0.098827219
teeth	1.552638079	12	7.728781204	0.073365928	0.100777373
cheek	1.652734333	9	5.445521292	0.085103274	0.114386121
nails	1.655994164	9	5.434801762	0.084386334	0.114386121
duodenum	1.911632607	5	2.615565345	0.118650064	0.15777934
lacrimal apparatus	2.717116638	3	1.104111601	0.126686579	0.166692867
ovary	1.424239255	10	7.021292217	0.141115449	0.179994195
nose	1.285162408	17	13.22790015	0.139120743	0.179994195
larynx	1.510731518	8	5.295447871	0.140141209	0.179994195
trachea	1.702329767	5	2.937151248	0.15683367	0.196042087
vocal cords	1.594661047	6	3.762555066	0.156006203	0.196042087
ear	1.235598294	18	14.56784141	0.1681863	0.208151361
sinuses	2.057816277	3	1.457856094	0.18350595	0.224884743
ureter	1.371877518	8	5.831424376	0.195590462	0.237367066
urethra	1.450067428	6	4.13773862	0.201813363	0.240254004
cerebrospinal fluid	1.529306086	5	3.269456681	0.200886131	0.240254004
pituitary gland	1.369001465	7	5.113215859	0.214619813	0.25072408
parathyroid	2.743755036	2	0.728928047	0.214224274	0.25072408
appendix	0	0	0.246549192	0.219861344	0.254469148
epiglottis	1.675826429	3	1.790161527	0.240021302	0.275253787
lips	1.205007594	12	9.958443465	0.250007561	0.284099501
chin	1.222643135	10	8.179001468	0.257201051	0.289640823
aorta	1.313910862	3	2.283259912	0.329356502	0.367585381
hypothalamus	1.260644206	2	1.586490455	0.374778817	0.414578338
middle ear	1.099658207	6	5.456240822	0.39252034	0.430395109
outer ear	0.586100552	6	10.23715125	0.071259135	1
inner ear	0.64558942	2	3.0979442	0.286156549	1

vagina	0.929160072	5	5.381204112	0.456603686	1
vulva	0.251449249	1	3.976945668	0.05121321	1
hair	0.943165794	11	11.66284875	0.42992786	1
olfactory bulb	0	0	1.682966226	0.090266464	1
forehead	0.547462859	5	9.133039648	0.065670986	1
scalp	0.88007237	2	2.272540382	0.466393856	1
lymph vessels	0	0	0.836123348	0.214681616	1
fallopian tube	0.701411062	1	1.425697504	0.407973224	1
vas deferens	0	0	1.211306902	0.146434826	1

<Banhasasim-tang Organs>

Name	Enrichment ratio	Observed	Expected	P-value	FDR	
brain	1.680639508	69	41.05580029	9.80401E-13	1.07139E-10	↑
peripheral nerves	2.381216833	51	21.41762115	1.71423E-12	1.07139E-10	↑
head	1.524664251	70	45.91174743	1.10935E-10	4.6223E-09	↑
spinal cord	2.509707691	41	16.33656388	6.78516E-10	1.67422E-08	↑
heart	2.063170526	51	24.71923642	6.26126E-10	1.67422E-08	↑
lung	2.246718784	46	20.4743025	8.03627E-10	1.67422E-08	↑
peripheral nervous system	1.930592181	53	27.45271659	2.0458E-09	3.65322E-08	↑
liver	2.354616702	42	17.83729809	2.4367E-09	3.80734E-08	↑
bone marrow	2.963255439	27	9.111600587	1.23395E-07	1.71382E-06	↑
pancreas	3.080834585	25	8.114684288	2.22118E-07	2.52407E-06	↑
small intestine	2.718937152	29	10.66593245	2.02047E-07	2.52407E-06	↑
kidney	1.918064268	44	22.93979442	4.47199E-07	4.29999E-06	↑
intestine	2.221135029	36	16.20792952	4.20422E-07	4.29999E-06	↑
blood vessels	1.745652531	50	28.64258443	5.13434E-07	4.31913E-06	↑
large intestine	2.349994772	33	14.04258443	5.18295E-07	4.31913E-06	↑
skin	1.630574422	52	31.89060206	2.17861E-06	1.70204E-05	↑
upper limb	1.857791461	42	22.60748899	2.81971E-06	2.07332E-05	↑
esophagus	2.563931767	26	10.14067548	3.51541E-06	2.44126E-05	↑
rectum	2.906981257	22	7.567988253	4.02079E-06	2.64525E-05	↑
stomach	2.178214546	29	13.31365639	1.71877E-05	0.000107423	↑
lower limb	1.730676254	41	23.69016153	2.7582E-05	0.000164178	↑
eye	1.623335346	45	27.72070485	3.83163E-05	0.000196444	↑
toes	1.864687889	35	18.76989721	3.92888E-05	0.000196444	↑
hand	1.811886528	37	20.42070485	3.68869E-05	0.000196444	↑
anus	3.237749978	16	4.941703377	3.73078E-05	0.000196444	↑
digit	1.818276212	36	19.7989721	4.81994E-05	0.000231728	↑
wrist	2.049501868	29	14.14977974	5.34153E-05	0.000247293	↑
mouth	1.72101191	39	22.66108664	6.23019E-05	0.000278133	↑
foot	1.730147286	37	21.38546256	0.000104446	0.000450197	↑
neck	1.84956969	32	17.30132159	0.000128351	0.000478718	↑
elbow	1.989379128	28	14.07474302	0.000130211	0.000478718	↑
shoulder	1.954727215	29	14.83582966	0.000125264	0.000478718	↑
forearm	2.090930562	26	12.43465492	0.000116351	0.000478718	↑
arm	2.034545334	27	13.27077827	0.000126729	0.000478718	↑



knee	1.949294623	28	14.36417034	0.000184279	0.000654162	↑
fingers	1.757219292	34	19.34875184	0.000188399	0.000654162	↑
gallbladder	3.901765717	11	2.819236417	0.000195332	0.000659905	↑
ankle	1.934855403	28	14.47136564	0.000208953	0.000669721	↑
hip	1.934855403	28	14.47136564	0.000208953	0.000669721	↑
breast	2.152072656	23	10.68737151	0.000228062	0.000712692	↑
prostate	2.289268006	20	8.736417034	0.00031429	0.000944124	↑
coagulation system	2.158074413	22	10.19427313	0.000317226	0.000944124	↑
spleen	2.437123486	18	7.385756241	0.000337432	0.000980906	↑
meninges	2.759990273	15	5.434801762	0.000358737	0.001019139	
chest wall	1.937036363	25	12.90631424	0.000532903	0.00146466	
shin	1.977830486	24	12.13450808	0.000538995	0.00146466	
white blood cells	1.674003888	33	19.71321586	0.000632785	0.00168294	
scapula	2.034022564	22	10.81600587	0.000698642	0.001782249	
thigh	1.943493151	24	12.34889868	0.000690484	0.001782249	
red blood cells	2.053502197	21	10.22643172	0.000856295	0.002140737	
urinary bladder	2.411312988	16	6.635389134	0.000875616	0.002146118	
clavicle	1.954598826	22	11.25550661	0.001168853	0.002809743	
sternum	1.947180993	22	11.29838473	0.001226828	0.002893463	
humerus	1.927069265	22	11.41629956	0.001399292	0.003239101	
fibula	1.961002098	21	10.70881057	0.001509248	0.003371795	
rib	1.912701554	22	11.5020558	0.001537538	0.003371795	
rib cage	1.912701554	22	11.5020558	0.001537538	0.003371795	
tibia	1.93581136	21	10.84816446	0.001763798	0.003801289	
ulna	1.898295636	21	11.06255507	0.002227137	0.00471851	
face	1.563753525	32	20.46358297	0.002627691	0.005474356	
radius	1.865753425	21	11.25550661	0.002729424	0.005502872	
maxilla	1.646945015	28	17.00117474	0.002687544	0.005502872	
mandible	1.636625811	28	17.10837004	0.002948477	0.005850153	
femur	1.834308142	21	11.44845815	0.00332504	0.006494218	
jaws	1.614372555	28	17.34419971	0.003600846	0.006924704	
spinal column	1.671822065	25	14.95374449	0.004138516	0.007838098	
vertebrae	1.696139477	24	14.14977974	0.004255894	0.0079401	
pelvis	1.669578009	24	14.37488987	0.005187285	0.009263008	
biliary tract	2.665362035	10	3.751835536	0.005165672	0.009263008	
diaphragm	2.672999176	10	3.741116006	0.005075078	0.009263008	
bronchus	2.650217933	10	3.773274596	0.0053506	0.009420071	
lymph nodes	2.541898399	10	3.934067548	0.006905161	0.011988126	
blood	1.370843699	39	28.44963289	0.007775177	0.013313659	

skull	1.430663429	34	23.76519824	0.007929515	0.013394452
tongue	2.192658939	11	5.016740088	0.01184723	0.019745383
thymus	4.021020312	5	1.243465492	0.015213536	0.025022263
abdominal wall	1.920157898	12	6.24948605	0.020674872	0.033563105
cerebellum	1.48311083	20	13.48516887	0.035501591	0.056893575
cranial nerves	1.390692773	25	17.97665198	0.036947932	0.058461917
pharynx	1.738279588	12	6.903377386	0.038343926	0.059912385
adrenal gland	2.050278489	8	3.901908957	0.042060394	0.064908015
testis	1.520508544	17	11.1804699	0.042771251	0.065200078
placenta	2.322514637	6	2.583406755	0.05013143	0.075499141
heart valve	2.092992624	7	3.344493392	0.051792473	0.077072133
eyelid	1.479375383	17	11.49133627	0.052698673	0.077498048
uterus	1.560367261	14	8.972246696	0.053871159	0.078301103
thyroid	2.229984173	6	2.690602056	0.057158111	0.082123722
penis	1.561299937	12	7.685903084	0.071155597	0.101073292
teeth	1.552638079	12	7.728781204	0.073365928	0.103042033
ovary	1.566663181	11	7.021292217	0.080421897	0.111697079
nails	1.655994164	9	5.434801762	0.084386334	0.115915294
sweat gland	1.700556507	7	4.116299559	0.108172762	0.146973862
urethra	1.691745333	7	4.13773862	0.110078556	0.147955048
duodenum	1.911632607	5	2.615565345	0.118650064	0.156118505
salivary gland	1.919499408	5	2.604845815	0.117459241	0.156118505
lacrimal apparatus	2.717116638	3	1.104111601	0.126686579	0.164956483
larynx	1.510731518	8	5.295447871	0.140141209	0.180594342
cheek	1.469097185	8	5.445521292	0.154747132	0.196042087
trachea	1.702329767	5	2.937151248	0.15683367	0.196042087
vocal cords	1.594661047	6	3.762555066	0.156006203	0.196042087
lips	1.305424893	13	9.958443465	0.164920194	0.204109151
ear	1.235598294	18	14.56784141	0.1681863	0.206110661
aorta	1.75188115	4	2.283259912	0.181059863	0.219732844
sinuses	2.057816277	3	1.457856094	0.18350595	0.220560036
ureter	1.371877518	8	5.831424376	0.195590462	0.232845789
cerebrospinal fluid	1.529306086	5	3.269456681	0.200886131	0.236894022
nose	1.209564619	16	13.22790015	0.208524365	0.24360323
parathyroid	2.743755036	2	0.728928047	0.214224274	0.247944761
appendix	0	0	0.246549192	0.219861344	0.252134569
epiglottis	1.675826429	3	1.790161527	0.240021302	0.27275148
chin	1.222643135	10	8.179001468	0.257201051	0.289640823
pituitary gland	1.173429827	6	5.113215859	0.340044208	0.379513625
hypothalamus	1.260644206	2	1.586490455	0.374778817	0.414578338

middle ear	1.099658207	6	5.456240822	0.39252034	0.430395109
hair	1.028908139	12	11.66284875	0.445025672	0.483723556
outer ear	0.683783978	7	10.23715125	0.137495796	1
inner ear	0.64558942	2	3.0979442	0.286156549	1
vagina	0.929160072	5	5.381204112	0.456603686	1
vulva	0	0	3.976945668	0.008189329	1
olfactory bulb	0	0	1.682966226	0.090266464	1
forehead	0.656955431	6	9.133039648	0.133469642	1
scalp	0.88007237	2	2.272540382	0.466393856	1
lymph vessels	0	0	0.836123348	0.214681616	1
fallopian tube	0.701411062	1	1.425697504	0.407973224	1
vas deferens	0	0	1.211306902	0.146434826	1

<YMJ Organs>

Name	Enrichment ratio	Observed	Expected	P-value	FDR	
brain	1.697246618	42	24.74596182	2.93418E-08	3.66773E-06	↑
head	1.553870482	43	27.67283407	2.13975E-07	1.33734E-05	↑
peripheral nerves	2.246450996	29	12.9092511	1.01863E-06	4.24429E-05	↑
heart	2.080639439	31	14.89926579	1.42485E-06	4.45267E-05	↑
peripheral nervous system	1.87346917	31	16.54684288	1.55985E-05	0.000389963	↑
lung	2.106853879	26	12.34067548	2.4017E-05	0.000500355	↑
spinal cord	2.234251969	22	9.846696035	7.63887E-05	0.001241311	
pancreas	3.066830791	15	4.891042584	7.94439E-05	0.001241311	
kidney	1.880416313	26	13.8267254	0.000180095	0.002501313	
blood vessels	1.679793821	29	17.26402349	0.000384872	0.004674409	
small intestine	2.488807675	16	6.428781204	0.000411348	0.004674409	
intestine	2.047258297	20	9.769162996	0.000646922	0.006738768	
liver	1.953261582	21	10.75124816	0.000798133	0.007326324	
coagulation system	2.441210209	15	6.144493392	0.000820548	0.007326324	
large intestine	2.126648161	18	8.464023495	0.000930015	0.007750121	
chest wall	2.185329206	17	7.779148311	0.001042505	0.008144568	
rectum	2.630697914	12	4.561527166	0.001852378	0.01362043	
forearm	2.134796238	16	7.494860499	0.001988799	0.013811103	
skin	1.508708938	29	19.22173275	0.002650119	0.015852737	
wrist	1.993285124	17	8.528634361	0.002739294	0.015852737	
gallbladder	4.119426201	7	1.699265786	0.002790082	0.015852737	
bone marrow	2.367112299	13	5.491923642	0.002688283	0.015852737	
breast	2.173338196	14	6.441703377	0.00364455	0.017982884	
neck	1.821983778	19	10.42819383	0.003702296	0.017982884	
arm	2.000293729	16	7.998825257	0.00374044	0.017982884	
anus	3.021593374	9	2.97856094	0.003629063	0.017982884	
spinal column	1.886119257	17	9.013215859	0.00477628	0.02132268	
abdominal wall	2.654763761	10	3.76681351	0.004669999	0.02132268	
vertebrae	1.876033058	16	8.528634361	0.006810304	0.024322513	
rib	2.019401847	14	6.932745962	0.006727232	0.024322513	
rib cage	2.019401847	14	6.932745962	0.006727232	0.024322513	
sternum	2.055804727	14	6.809985316	0.005808807	0.024322513	
elbow	1.886034757	16	8.483406755	0.006486151	0.024322513	
upper limb	1.614509246	22	13.62643172	0.006562534	0.024322513	

eyelid	2.021285617	14	6.926284875	0.00667614	0.024322513
pelvis	1.846654464	16	8.664317181	0.007863297	0.025202876
mandible	1.745557075	18	10.31189427	0.007751962	0.025202876
maxilla	1.756563109	18	10.24728341	0.007276384	0.025202876
knee	1.848032564	16	8.657856094	0.007810312	0.025202876
eye	1.496256064	25	16.70837004	0.008512886	0.02533597
ankle	1.834343434	16	8.72246696	0.008353495	0.02533597
hip	1.834343434	16	8.72246696	0.008353495	0.02533597
tibia	1.988187208	13	6.538619677	0.010460047	0.025637369
fibula	2.014059514	13	6.454625551	0.00949867	0.025637369
scapula	1.994098567	13	6.519236417	0.010231671	0.025637369
jaws	1.721822677	18	10.45403818	0.008889096	0.025637369
shoulder	1.789280084	16	8.942143906	0.010434851	0.025637369
hand	1.624910523	20	12.30837004	0.009919419	0.025637369
shin	1.914150337	14	7.313950073	0.010348982	0.025637369
diaphragm	3.104324043	7	2.254919236	0.010085533	0.025637369
stomach	1.869235837	15	8.024669604	0.009409912	0.025637369
skull	1.535859269	22	14.32422907	0.011911551	0.027978993
ulna	1.949656448	13	6.66784141	0.012086925	0.027978993
thigh	1.880918561	14	7.443171806	0.011879241	0.027978993
clavicle	1.916233766	13	6.784140969	0.013714608	0.030612964
radius	1.916233766	13	6.784140969	0.013714608	0.030612964
prostate	2.088957055	11	5.265785609	0.014112764	0.030769956
mouth	1.537477423	21	13.65873715	0.014538238	0.030769956
femur	1.883937692	13	6.900440529	0.015508058	0.030769956
humerus	1.889244558	13	6.881057269	0.015197188	0.030769956
digit	1.592139588	19	11.93362702	0.015344092	0.030769956
white blood cells	1.599065698	19	11.88193833	0.014692584	0.030769956
esophagus	1.963290409	12	6.112187959	0.015478255	0.030769956
foot	1.551606288	20	12.88986784	0.016194586	0.031630051
urinary bladder	2.250330445	9	3.999412628	0.018417532	0.03541833
toes	1.591038887	18	11.3133627	0.019035782	0.036052618
face	1.540430497	19	12.33421439	0.02122615	0.039601026
lower limb	1.470691074	21	14.27900147	0.023423756	0.043058376
fingers	1.54343994	18	11.66226138	0.025170609	0.045598929
placenta	3.211052433	5	1.55712188	0.029288975	0.052301742
biliary tract	2.653246753	6	2.261380323	0.03135673	0.054958543
spleen	2.02170471	9	4.451688693	0.031656121	0.054958543
red blood cells	1.784591195	11	6.163876652	0.036459831	0.062431217

teeth	1.931975791	9	4.658443465	0.039485495	0.066698471
testis	1.632310642	11	6.738913363	0.059977683	0.099962805
thymus	4.002742947	3	0.74948605	0.073227588	0.120440111
uterus	1.664222874	9	5.407929515	0.078597253	0.127592943
nose	1.505083247	12	7.97298091	0.079770502	0.127790748
tongue	1.984265734	6	3.023788546	0.080763753	0.127790748
bronchus	2.19847624	5	2.274302496	0.082537921	0.128965501
duodenum	2.537257824	4	1.57650514	0.088057439	0.135891109
thyroid	2.466497646	4	1.621732746	0.093219024	0.142102171
larynx	1.879830696	6	3.191776799	0.095242464	0.143437446
chin	1.622780889	8	4.929809104	0.104150447	0.153162422
cheek	1.828024338	6	3.282232012	0.103569363	0.153162422
pharynx	1.682312253	7	4.160939794	0.109388243	0.158994539
blood	1.224652326	21	17.14772394	0.130654649	0.187722197
appendix	0	0	0.148604993	0.138714535	0.197037692
heart valve	1.984265734	4	2.015859031	0.142646947	0.200346836
parathyroid	4.552139037	2	0.439353891	0.152814187	0.212241927
penis	1.51103081	7	4.632599119	0.155808552	0.214022736
aorta	2.179897567	3	1.376211454	0.169940828	0.230897864
pituitary gland	1.622355632	5	3.081938326	0.174024815	0.233904321
vocal cords	1.763791764	4	2.26784141	0.178046985	0.236764608
adrenal gland	1.700799201	4	2.351835536	0.19044059	0.250579723
lymph nodes	1.68689621	4	2.371218796	0.193340543	0.251745499
meninges	1.526358257	5	3.275770925	0.200255947	0.258061788
ovary	1.417765441	6	4.232011747	0.2117973	0.267420833
sweat gland	1.612215909	4	2.481057269	0.210046081	0.267420833
cranial nerves	1.199788584	13	10.83524229	0.235581598	0.291561383
ureter	1.422543449	5	3.514831131	0.23451391	0.291561383
cerebellum	1.230307848	10	8.12804699	0.245729743	0.301139392
hypothalamus	2.091523342	2	0.956240822	0.256298324	0.311041655
epiglottis	1.853565596	2	1.079001468	0.278548812	0.334794245
hair	1.138034759	8	7.029662261	0.343862028	0.405497675
nails	1.221086606	4	3.275770925	0.34212251	0.405497675
forehead	1.089948784	6	5.504845815	0.399679589	0.462592117
trachea	1.129727936	2	1.770337739	0.411408065	0.47179824
sinuses	1.138034759	1	0.878707783	0.424340245	0.477860636
fallopian tube	1.163704716	1	0.859324523	0.421308324	0.477860636
ear	1.024984949	9	8.78061674	0.453543937	0.506187429
lips	0.999608572	6	6.002349486	0.478061564	0.528829163
outer ear	0.972394098	6	6.170337739	0.490675206	0.999999997

middle ear	0.912216467	3	3.288693098	0.465513762	0.999999997
inner ear	0	0	1.867254038	0.073728687	0.999999997
vagina	0.616624411	2	3.243465492	0.25717468	0.999999997
vulva	0	0	2.397063142	0.042171247	0.999999997
urethra	0.801931229	2	2.493979442	0.409955138	0.999999997
olfactory bulb	0	0	1.014390602	0.178582243	0.999999997
cerebrospinal fluid	0.507451565	1	1.970631424	0.269682046	0.999999997
scalp	0	0	1.369750367	0.123791808	0.999999997
lymph vessels	0	0	0.503964758	0.300701636	0.999999997
lacrimal apparatus	0	0	0.665491924	0.255159699	0.999999997
salivary gland	0.636924804	1	1.570044053	0.365906776	0.999999997
vas deferens	0	0	0.73010279	0.238895457	0.999999997

<Common target Organs>

Name	Enrichment ratio	Observed	Expected	P-value	FDR	
brain	1.734700376	40	23.05873715	1.30281E-08	1.62852E-06	↑
head	1.551226346	40	25.78604993	7.5327E-07	4.70794E-05	↑
peripheral nerves	2.244561635	27	12.02907489	2.57986E-06	9.05825E-05	↑
heart	2.088824488	29	13.88340675	2.89864E-06	9.05825E-05	↑
peripheral nervous system	1.88083923	29	15.41864905	2.71738E-05	0.000679346	↑
pancreas	3.291233044	15	4.557562408	3.36264E-05	0.000700551	↑
lung	2.087089771	24	11.49926579	6.19889E-05	0.001106946	
kidney	1.940392067	25	12.88399413	0.000126451	0.001975794	
small intestine	2.670915553	16	5.990455213	0.000173798	0.002413862	
intestine	2.197057685	20	9.1030837	0.000221834	0.002506362	
spinal cord	2.179758018	20	9.175330396	0.000246564	0.002506362	
liver	2.096183161	21	10.01820852	0.000260662	0.002506362	
blood vessels	1.740543304	28	16.08693098	0.000212462	0.002506362	
coagulation system	2.619835347	15	5.725550661	0.000375775	0.003131461	
large intestine	2.282256563	18	7.886930984	0.000364495	0.003131461	
forearm	2.291000841	16	6.983847283	0.000898415	0.00701887	
rectum	2.823188005	12	4.25051395	0.001015776	0.007468944	
wrist	2.139135255	17	7.947136564	0.001195559	0.008302496	
chest wall	2.207276558	16	7.248751836	0.001315983	0.00865778	
bone marrow	2.540315638	13	5.117474302	0.001424019	0.008900121	
arm	2.146656685	16	7.453450808	0.001742797	0.010373792	
gallbladder	4.420847631	7	1.583406755	0.001967994	0.011181782	
anus	3.242685572	9	2.775477239	0.002340616	0.012720738	
sternum	2.206229463	14	6.345668135	0.003035602	0.015560815	
elbow	2.024037301	16	7.904992658	0.003112163	0.015560815	
rib	2.167162958	14	6.460058737	0.003540131	0.016389496	
rib cage	2.167162958	14	6.460058737	0.003540131	0.016389496	
knee	1.983254459	16	8.067547724	0.003787001	0.016906254	
ankle	1.968563686	16	8.127753304	0.004066082	0.016942009	
hip	1.968563686	16	8.127753304	0.004066082	0.016942009	
breast	2.165765589	13	6.002496329	0.00522502	0.019836322	
fibula	2.161429722	13	6.014537445	0.005307742	0.019836322	
scapula	2.140008219	13	6.074743025	0.005737351	0.019836322	
tibia	2.133664321	13	6.092804699	0.005871551	0.019836322	



shin	2.054210118	14	6.815271659	0.005563933	0.019836322
shoulder	1.920203017	16	8.332452276	0.005146236	0.019836322
spinal column	1.905061631	16	8.398678414	0.005542782	0.019836322
thigh	2.018546748	14	6.935682819	0.006432734	0.02116031
ulna	2.092314237	13	6.213215859	0.006832097	0.021897747
diaphragm	3.331469704	7	2.101174743	0.007312326	0.02285102
clavicle	2.056445993	13	6.321585903	0.007800516	0.023215823
radius	2.056445993	13	6.321585903	0.007800516	0.023215823
abdominal wall	2.564113291	9	3.509985316	0.009013975	0.02360355
humerus	2.027481965	13	6.411894273	0.008688482	0.02360355
femur	2.021786791	13	6.429955947	0.008875342	0.02360355
vertebrae	1.887472284	15	7.947136564	0.008219864	0.02360355
pelvis	1.857914552	15	8.073568282	0.009408528	0.02360355
neck	1.749478647	17	9.717180617	0.009228553	0.02360355
hand	1.656616094	19	11.469163	0.00944142	0.02360355
skin	1.451608936	26	17.91116006	0.008723501	0.02360355
upper limb	1.575130972	20	12.69735683	0.01269074	0.031104754
white blood cells	1.625751005	18	11.07180617	0.014525748	0.034917663
digit	1.618709311	18	11.11997063	0.015146256	0.035722301
toes	1.612597679	17	10.54199706	0.019571223	0.045303757
spleen	2.169634323	9	4.148164464	0.021884644	0.04821217
prostate	2.038006883	10	4.906754772	0.022024496	0.04821217
esophagus	1.931366988	11	5.695447871	0.022370447	0.04821217
eyelid	1.859301056	12	6.454038179	0.021587568	0.04821217
placenta	3.446007489	5	1.450954479	0.023748581	0.04947621
red blood cells	1.915171039	11	5.743612335	0.023540073	0.04947621
biliary tract	2.84738676	6	2.107195301	0.024405559	0.05001139
fingers	1.56435376	17	10.8671072	0.025580232	0.051573048
stomach	1.738541298	13	7.47753304	0.026413564	0.052407865
teeth	2.073339873	9	4.34082232	0.027538049	0.053361059
eye	1.413049629	22	15.569163	0.027747751	0.053361059
foot	1.49862461	18	12.01101322	0.031017738	0.058745716
urinary bladder	2.146656685	8	3.726725404	0.03236758	0.060387276
maxilla	1.570910097	15	9.548604993	0.036178968	0.066505455
mandible	1.561067302	15	9.608810573	0.037923517	0.068702024
testis	1.751748006	11	6.279441997	0.039766269	0.071011195
lower limb	1.427988081	19	13.30543319	0.04069313	0.071642835
jaws	1.539841418	15	9.741262849	0.0419826	0.071888013
skull	1.423479323	19	13.34757709	0.041883429	0.071888013

mouth	1.414264947	18	12.72745962	0.051374428	0.086781129
uterus	1.785995279	9	5.039207048	0.056511931	0.094186551
thymus	4.295626577	3	0.698384728	0.06591701	0.108416136
bronchus	2.359340355	5	2.119236417	0.068478947	0.111167122
duodenum	2.722910836	4	1.469016153	0.076161575	0.119403037
larynx	2.017379283	6	2.974155653	0.076417944	0.119403037
face	1.392122041	16	11.49324523	0.07568597	0.119403037
thyroid	2.646973083	4	1.511160059	0.08070971	0.124552021
blood	1.251677174	20	15.97856094	0.113738347	0.173381626
heart valve	2.12945591	4	1.878414097	0.12441893	0.185147217
penis	1.62159404	7	4.316740088	0.123187834	0.185147217
appendix	0	0	0.138472834	0.129873679	0.190990704
tongue	1.774546592	5	2.817621145	0.140478394	0.204183712
parathyroid	4.885222382	2	0.409397944	0.145410787	0.208872089
pituitary gland	1.74106458	5	2.871806167	0.147045951	0.208872089
vocal cords	1.892849698	4	2.113215859	0.155852272	0.21889364
adrenal gland	1.825247923	4	2.191483113	0.166880376	0.226931162
lymph nodes	1.81032764	4	2.209544787	0.169462651	0.226931162
meninges	1.638043008	5	3.052422907	0.169867603	0.226931162
cheek	1.634818514	5	3.058443465	0.170652234	0.226931162
pharynx	1.547492804	6	3.877239354	0.166736956	0.226931162
sweat gland	1.730182927	4	2.311894273	0.184352452	0.242569016
ureter	1.526631994	5	3.275183554	0.199869828	0.260247171
hypothalamus	2.244561635	2	0.891042584	0.244461546	0.315027766
cranial nerves	1.188533531	12	10.09647577	0.2553479	0.325698852
chin	1.306140715	6	4.593685756	0.261132281	0.329712476
epiglottis	1.989192347	2	1.005433186	0.265205328	0.33150666
nose	1.211408467	9	7.429368576	0.272105743	0.336764533
cerebellum	1.188297336	9	7.573861968	0.290308634	0.355770384
ovary	1.267920313	5	3.943465492	0.30005934	0.364149684
aorta	1.559601512	2	1.282378855	0.315948162	0.379745387
trachea	1.212390956	2	1.649632893	0.387027161	0.456399954
fallopian tube	1.248853842	1	0.800734214	0.412698583	0.47614948
sinuses	1.221305595	1	0.818795888	0.415202347	0.47614948
hair	1.068642396	7	6.550367107	0.412635061	0.47614948
nails	0.982825805	3	3.052422907	0.476147678	0.533992126
middle ear	0.978964014	3	3.064464023	0.478456945	0.533992126
forehead	0.974750945	5	5.129515419	0.496495313	0.545455296
ear	0.97776342	8	8.181938326	0.486968604	0.999999999
lips	0.893958886	5	5.593098385	0.415034441	0.999999999