Analyzing pathway enrichment in Partek Genomics Suite

- · Contents of the pathway enrichment spreadsheet
- Tasks available in Partek Genomics Suite

Pathway enrichment generates a results spreadsheet, Pathway-Enrichment txt, visible in both Partek Genomics Suite (Figure 1) and in Partek Pathway.

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	2.	Nicotine	kegg	18.113	1.36022e-08	25	3.33282	0.51346	3.3328		PCA Scatter Plot	
	3.	Morphine	kegg	15.9773	1.15117e-07	14.2857	3.33875	0.725444	3.3387		Correla Dev & Milisters Chart	
	4.	Retrograde	kegg	11.9984	6.15432e-06	9.45946	3.30376	0.774961	3.3037		Sample Box & Whiskers Chart	
	5.	Synaptic vesicle	kegg	11.2819	1.25985e-05	14.0625	3.65266	0.821323	3.6526		Sample Histogram	
	6. 7.	Neuroactive	kegg	11.011	1.65197e-05	6.83453	3.37986	0.679422	3.3798		✓ Analysis	
		Ras signaling	kegg	8.63564	0.00017766	6.66667	3.63383	1.36265	3.6338		Detect Differentially Expressed Genes	
	8.	Long-term	kegg	7.15903	0.000777809	10.4478	3.18603	0.65542	3.1860		View Sources of Variation	
	9.	Calcium	kegg	7.033	0.000882284	6.59341	.59341 3.30149	0.703896	3.3014		Create Gana List	
	10.	Dilated	kegg	6.92994	0.000978061	8.88889	3.4795	0.420761	3.4795			~
	11.	Adrenergic	kegg	6.43294	0.00160771	6.94444	3.448	0.469437	3.448		> Visualization	
	12.	Focal adhesion	kegg	6.3055	0.00182623	6.06061	3.53304	0.984251	3.5330		✓ Biological Interpretation	
	13.	Hypertrophic	kegg	5.89985	0.00273986	8.43373	3.52792	0.394031	3.5279		Gene Set Analysis	
	14.	Amphetamine	kegg	5.43165	0.00437589	8.82353	3.22463	0.617427	3.2246		Pathway Analysis	
	15.	cAMP signaling	kegg	5.21087	0.0054569	5.55556	3.46593	0.93421	3.4659		> Genomic Integration	
	16.	Amyotrophic	kegg	5.14106	0.00585148	9.80392	3.6008	0.712386	3.6008		> miRNA Integration	
	17.	Vascular	kegg	5.12173	0.00596569	6.66667	3.19604	0.911367	3.1960		· ····································	
	18.	Glycerophospho	kegg	5.03523	0.00650468	7.21649	3.471	1.10778	3.471			
	19.	Phosphatidylino	kegg	4.92554	0.00725884	7.07071	3.33572	0.881325	3.3357			
	20.	Alanine,	kegg	4.84399	0.00787556	11.4286	3.12884	0.732108	3.1288			
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Figure 6. The pathway enrichment spreadsheet is visible in both Partek Genomics Suite (shown here) and Partek Pathway

Contents of the pathway enrichment spreadsheet

The spreadsheet includes 13 columns with information for each pathway represented in the source gene list.

- 1. Pathway Name the name of the KEGG pathway
- 2. Database the source database for the pathway annotation
- 3. Enrichment score the negative natural log of the enrichment p-value derived from the contingency table (Fisher's Exact test) or the Chi-squared test
- 4. Enrichment p-value the enrichment p-value derived from the contingency table (Fisher's Exact test) or the Chi-squared test
- 5. % genes in pathway that are present the percentage of genes from the pathway that are present in the source gene list

6. Tissue score, 7. Replicate score, 8. Brain vs. Heart score - for each factor, interaction, and contrast in the ANVOA results spreadsheet, a separate score is calculated. This is derived form the negative log (base 10) of the average p-value for genes within the pathway for each factor. A high score indicates that the genes that fall into the pathway have a low p-value for the given factor.

- 9. # genes in list, in pathway number of genes from the list in the pathway
- 10. # genes not in list, in pathway number of genes from the pathway, not in the list
- 11. # genes in list, not in pathway number of genes in list, not in the pathway
- 12. # genes, not in list, not in pathway number of genes not in the pathway or the list that are included in KEGG database pathways for the species
- 13. Pathway ID KEGG pathway ID

Tasks available in Partek Genomics Suite

In Partek Genomics Suite, we can view several new options that are available for each pathway (row) in the Pathway-Enrichment.txt spreadsheet.

• Right-click the row header of any row in the Pathway-Enrichment.txt spreadsheet (Figure 2)

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Figure 7. The Pathway-Enrichment.txt spreadsheet in Partek Genomics Suite

The new options include:

Export genes in pathway, which creates a child spreadsheet of *Pathway-Enrichment.txt* that contains all the genes from the selected pathway(s) (Figure 3). This new spreadsheet includes gene symbols and their pathway.

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	8. AC3	GABAergic		Detect Differentially Expressed Genes					
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	12. AC7	GABAergic		> Visualization					
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Figure 8. Spreadsheet with all genes in pathway. Includes gene symbols and pathway.

Export genes in list and in pathway, which creates a child spreadsheet of *Pathway-Enrichment txt* that contains the genes from your list that are present in the selected pathway(s) (Figure 4). This new spreadsheet includes gene symbols and their pathway.

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Figure 9. Spreadsheet with genes only in list and pathway. Includes gene symbols and pathway.

Create Gene List, which creates a new child spreadsheet of the ANOVA results spreadsheet that contains the genes from your list that are present in the selected pathway(s) (Figure 5). This new spreadsheet includes all information for each gene from the ANOVA results spreadsheet. However, this list does not indicate the pathway of each gene.

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Figure 10. Spreadsheet with genes in list and pathway. Includes all information from ANOVA results for each gene.

Show Pathway, which opens the selected pathway map in Partek Pathway.

« Performing pathway enrichment Analyzing pathway enrichment in Partek Pathway »

Additional Assistance

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