Gene Ontology ANOVA

With gene ontology (GO) ANOVA, Partek Genomics Suite includes the ability to use rigorous statistical analysis to find differentially expressed functional groupings of genes. Leveraging the Gene Ontology database, Partek Genomics Suite can organize genes into functional groups. Not only can GO ANOVA detect up and down regulated functional groups, but also functional groups, which are disrupted in a few genes as a result of treatment. Moreover, the common diction of the GO effort enables this analysis to be compared across all types of gene expression data, including those from other species. Traditional tests, such as GO enrichment, require defining filtered lists of differentially expressed genes followed by an analysis of functional groups related to those genes. On the other hand, GO ANOVA is performed directly after data import and normalization. This minimizes the risk that a highly stringent filter will cause important functional groups to be overlooked.

Other tests, such as gene set enrichment analysis (GSEA), tolerate minimal or no pre-filtering. However, these tests are very limited in their ability to integrate complicated experimental designs. GSEA, for example, can only handle two groups at a time. GO ANOVA, on the other hand, can leverage the wealth of sample information collected and use powerful multi-factor ANOVA statistics to analyze very complex interactions and regulatory events. The analysis output includes detailed statistical results specifying the effect and importance of phenotypic information on differential expression and subsequent disruption of Gene Ontology functional categories. Furthermore, GSEA calculates enrichment scores using a running-sum statistic on a ranked gene list. GO ANOVA takes into account more information by utilizing each sample's expression values to calculate the enrichment score.

Note that the same principles apply to Pathway ANOVA, the only difference being the mapping file; GO ANOVA organizes genes into GO categories, while Pathway ANOVA looks at pathways.

This user guide deals with the following topics:

- Implementation details
- Configuring the GO ANOVA dialog
- Performing GO ANOVA
- GO ANOVA output
- GO ANOVA visualisations
- Recommended filters

Additional Assistance

If you need additional assistance, please visit our support page to submit a help ticket or find phone numbers for regional support.

Your Rating: ☆☆☆☆☆   Results: ★★★★⯪ 37 rates