Volcano Plot

The volcano plot is a special 2-D scatter plot used to visualize significance and the magnitude of changes in features (e.g. genes or transcripts) within a given comparison. By convention, the X-axis represents the fold change between the two groups and is on a $\log_2$ scale. On the other hand, the Y-axis shows negative log10 of the p-values from the statistical test of the comparison.

As a prerequisite for invoking the volcano plot, you must run a Differential gene expression analysis. When setting-up the analysis, include all relevant contrasts you would like to view the volcano plots for.

Once the analysis is complete, open the resulting Feature list data node. Navigate to the Gene list section of the page and click on the volcano plot icon, located on the left of the table header (Figure 1).

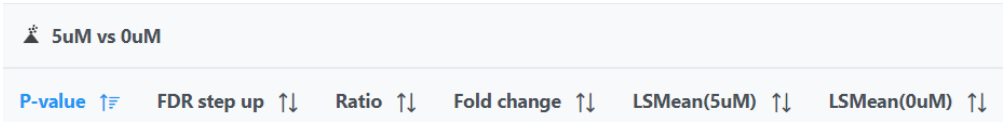

Figure 1. Invoking a volcano plot

Each point on the plot represents the statistical result for a single feature (e.g. gene, transcript etc.). The black vertical and horizontal lines represent threshold of fold change and p-value respectively. By default the two vertical lines represent fold changes of -2 and +2, the horizontal line represents significant p-value of 0.05. Features that are up/down-regulated by at least 2 fold and have a p-value less than 0.05 are at the upper-right and upper-left corner of the plot, they are highlighted in different colors. By default, significantly up-regulated features are in red, significantly down-regulated features are in blue, and the remaining features are in grey or black (Figure 2). The plot header is derived from the name of the contrast.

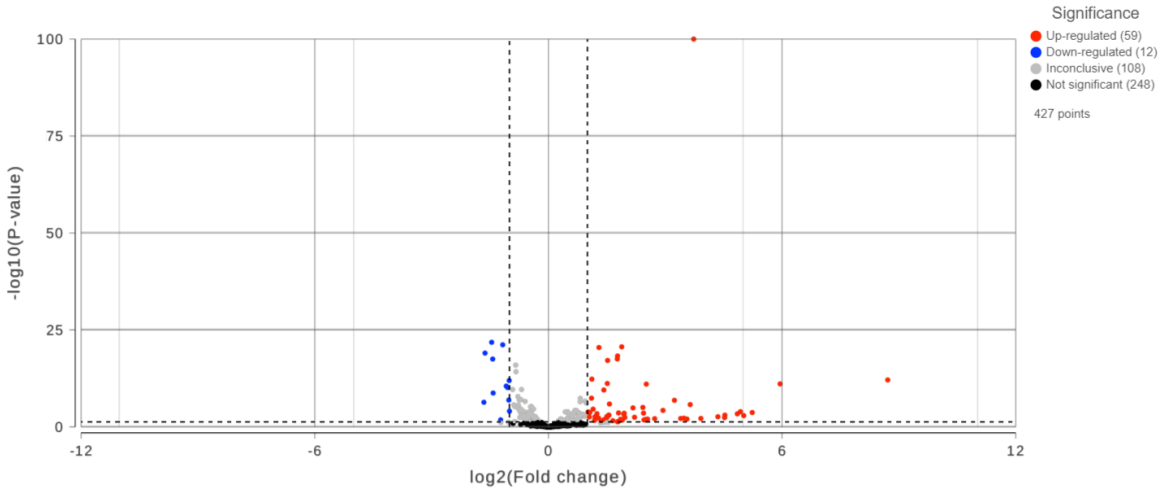

Figure 2. Volcano plot: each dot on the plot is a single gene/transcript/feature. Horizontal axis: fold change; vertical axis: p-value (in log10 scale). Colour coding is based on the fold change. Thick vertical lines highlight fold changes of -2 and +2, while a thick horizontal line represents a p-value of 0.05

The *Axes* and *Statistics* menus allow to customize which data sources will be used for the axes as well as annotations, limits and significance thresholds for the plot (Figure 3).

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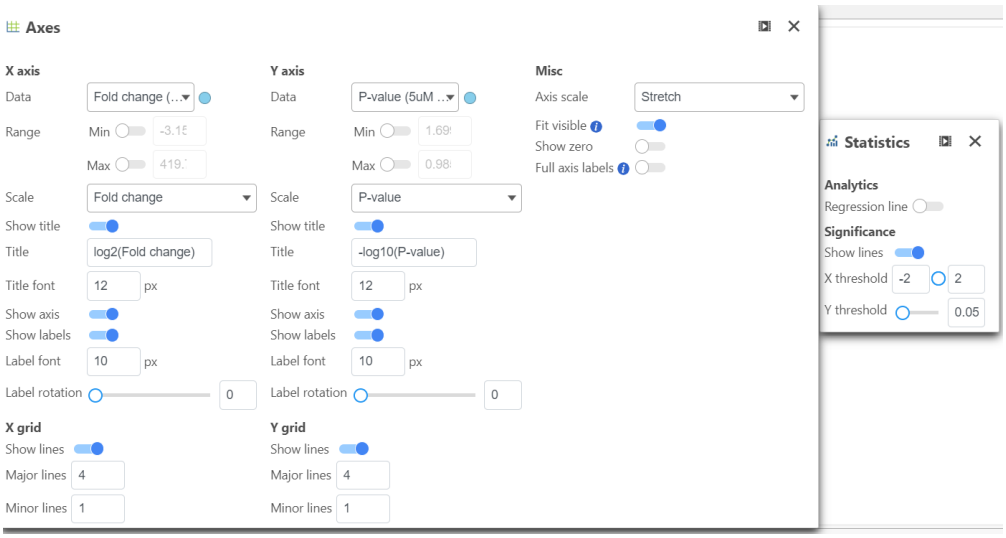
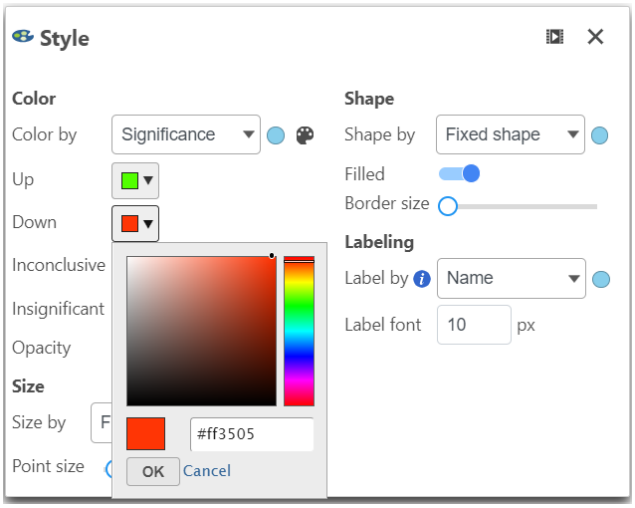


Figure 3. The plot can be configured using the menus on the left.

The colors can also be customised using the *Style* menu (Figure 4).



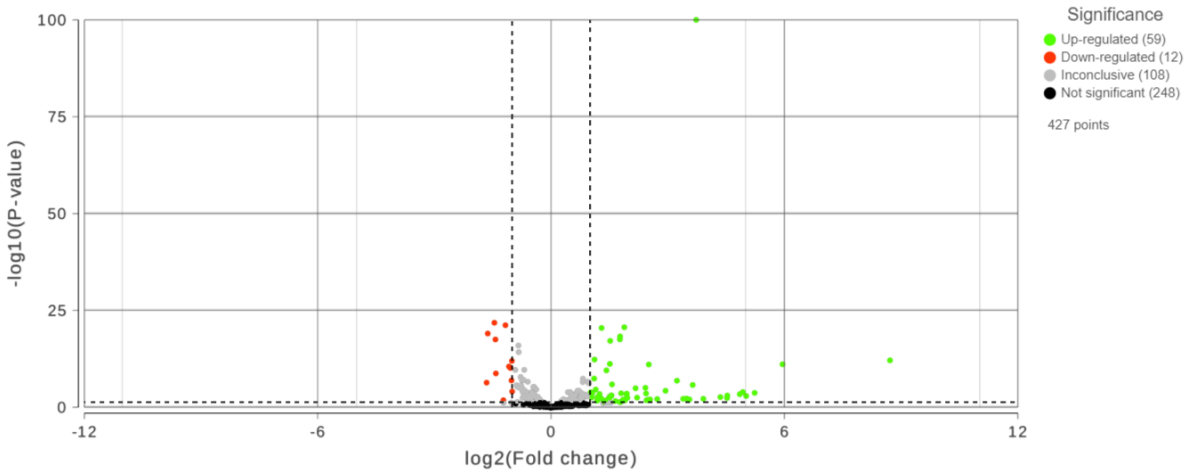


Figure 4. Volcano plot with a customized color scheme.

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You can also highlight and label any of the genes in the plot (Figure 5).

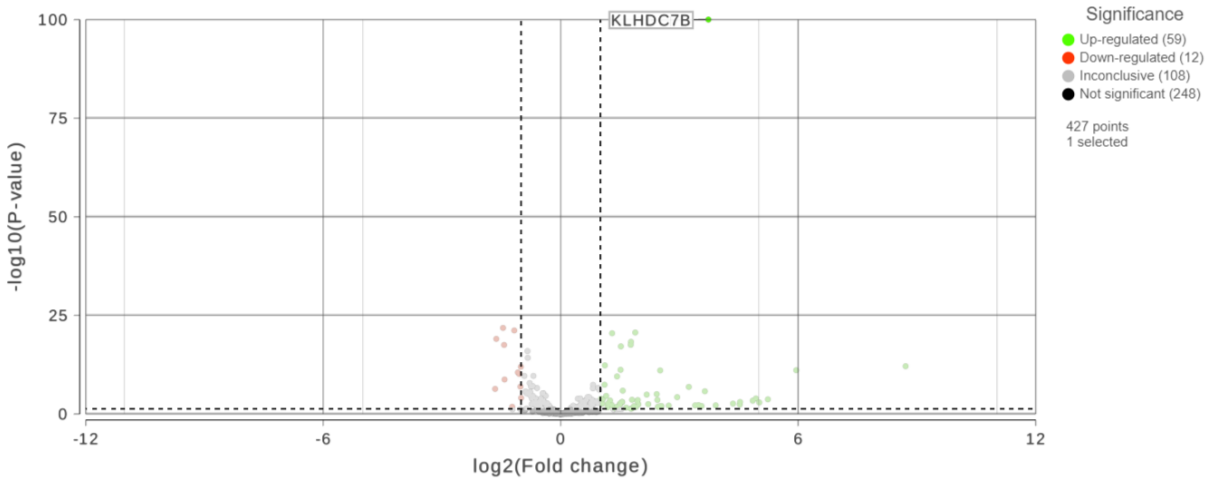

Figure 5. Easily highlight any gene by clicking on it directly.

Click the **Export image** button on the left panel to save a PNG, SVG, or PDF image to your computer.

Click the **To notebook** button on the left panel to send the image to a page in the Notebook.

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Your Rating: Results: 36 rates

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