

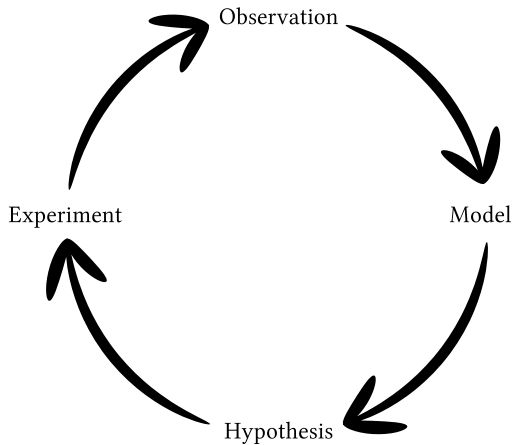
Practical Bioinformatics

Mark Voorhies

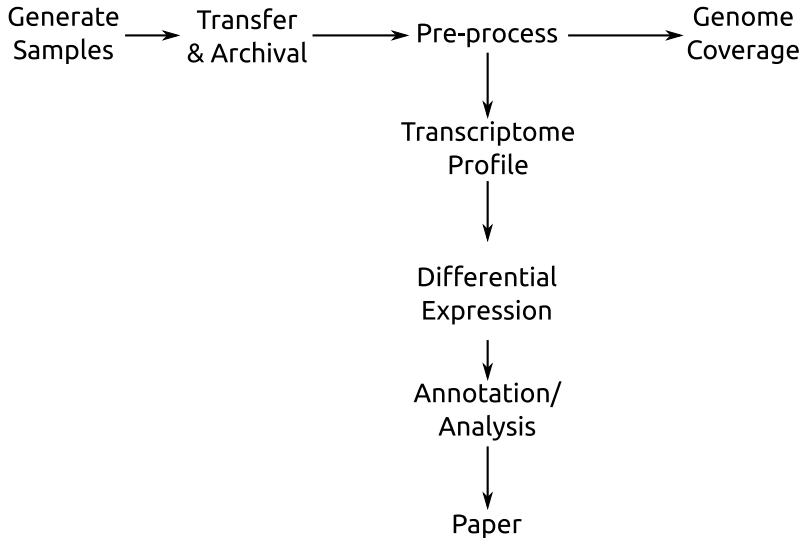
5/23/2019

JavaTreeView link-out for ENSEMBL Mouse

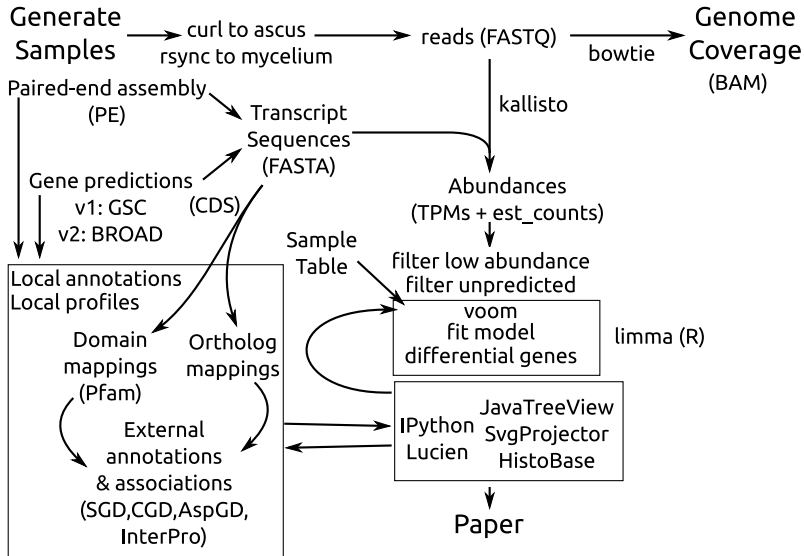
http://www.ensembl.org/Mus_musculus/Gene/Summary?g=HEADER



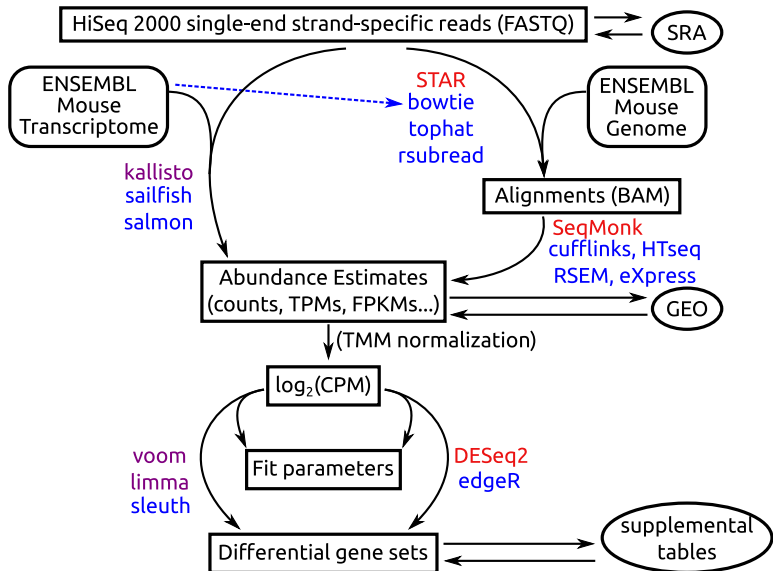
Example Pipeline: Overview



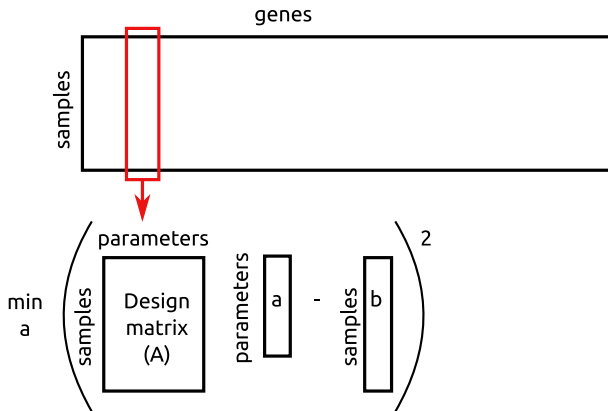
Example Pipeline: Details



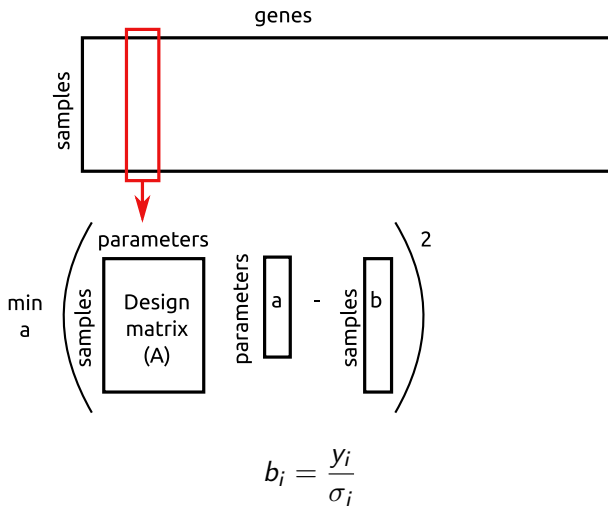
GSE88801 Pipelines



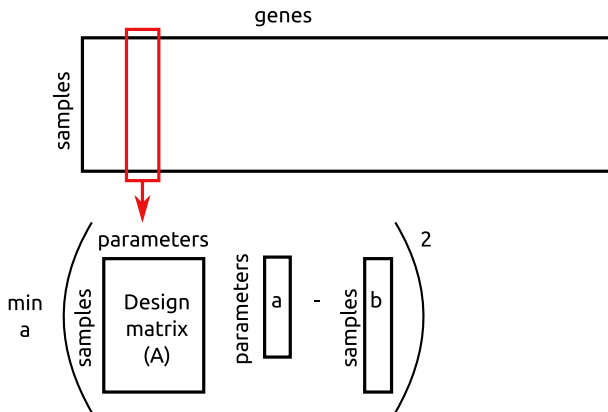
Linear Least Squares



Linear Least Squares

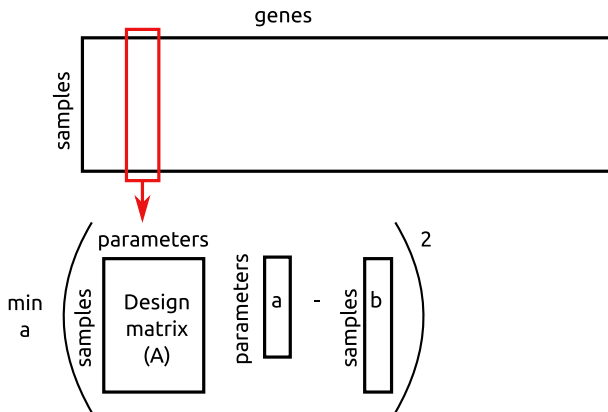


Linear Least Squares



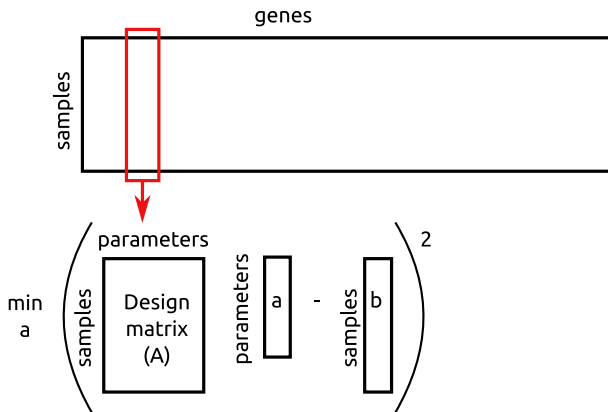
$$A_{ij} = \frac{f_j(x_i)}{\sigma_i}$$

Linear Least Squares



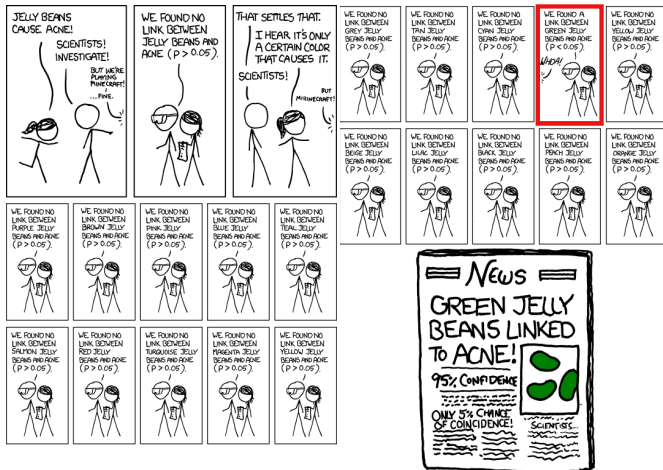
$$\chi^2 = |A \cdot a - b|^2$$

Linear Least Squares



$$a = \sum_i^M \left(\frac{U_i \cdot b}{s_i} \right) V_i$$

Multiple Hypothesis Testing



<http://xkcd.com/882/>

Explore today's limma results for the $\frac{\text{live}}{\text{uninfected}} | J77, 24h$ comparison (choose two or more):

- 1 Extract the gene names from limma1.J774.Live.24-J774.uninfected.24.t0.csv and paste them into the selection window in JavaTreeView.
- 2 Filter yesterday's heatmap to create a new CDT file for just these differential genes.
- 3 Redo our PCA and clustering protocol for just these differential genes.
- 4 Find the corresponding set of differential genes from the "J774 Live vs Uninfected" tab of S2 of the paper. Use python sets to find differential genes common to the two analysis pipelines.
- 5 Repeat the above for other interesting comparisons.