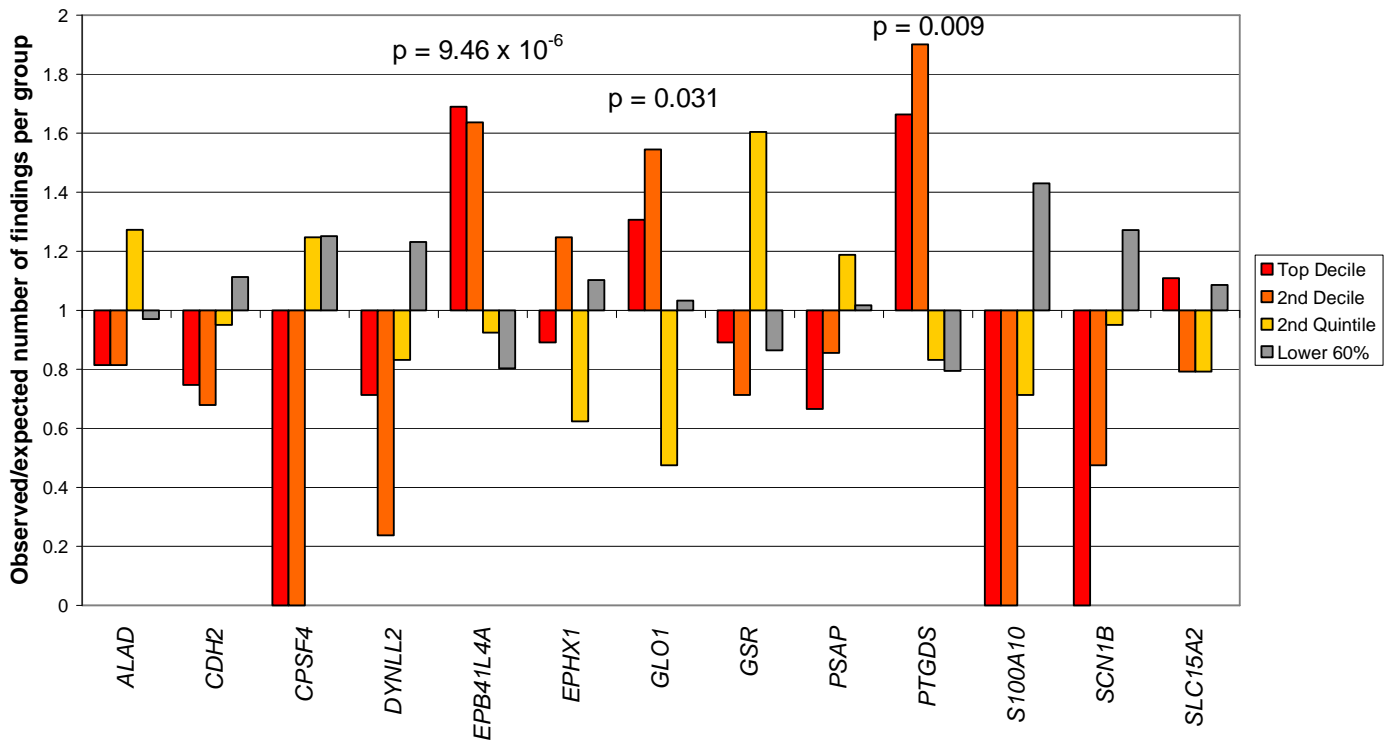
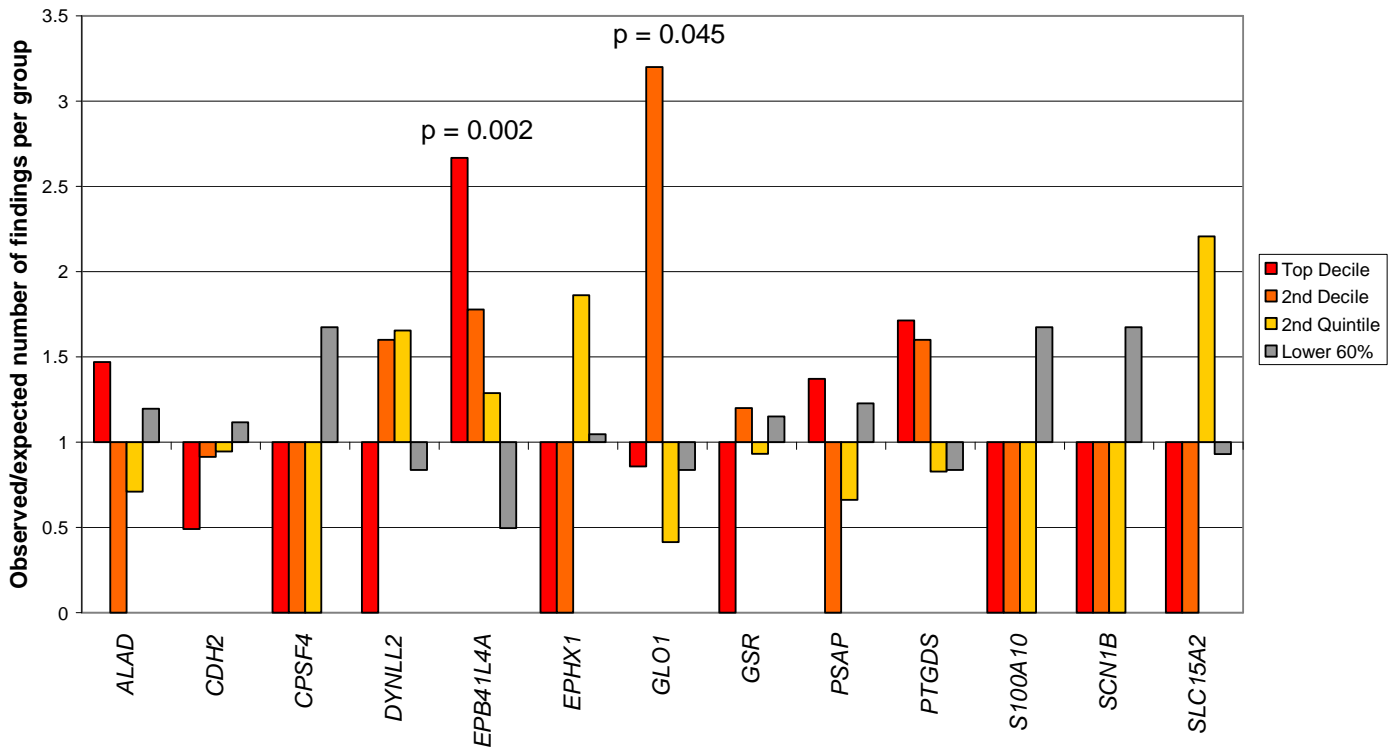


a. Analysis of ranked p-values (All)



b. Analysis of ranked p-values (Minimized over all tests per marker)



**Supplement 3.** Trend analysis of pointwise association across individual genes. The distribution of ranked p-values across groups representing top and bottom findings was examined for each gene. Significance of overrepresentation of a gene in the top quintile of ranked results was tested using a one-sided likelihood-ratio test. P-values for findings  $\leq 0.05$  are shown. The same analysis was carried out using all observed pointwise p-values (a), and minimized p-values (b).