

September 24, 2020

Supplementary materials

Table 1: eQTL enriched Pathways

GO hyaluronoglycosaminidase activity
GO hexosaminidase activity
KEGG glycosaminoglycan degradation
GO hydrolase activity hydrolyzing o glycosyl compounds
GO hydrolase activity acting on glycosyl bonds
NABA ecm regulators
GO response to UV B
GO hyaluronan catabolic process
REACTOME hyaluronan metabolism
GO hyaluronan metabolic process
REACTOME chondroitin sulfate dermatan sulfate
GO aminoglycan catabolic process
NABA matrisome associated
GO cellular response to UV B
REACTOME CS DS degradation
REACTOME hyaluronan uptake and degradation

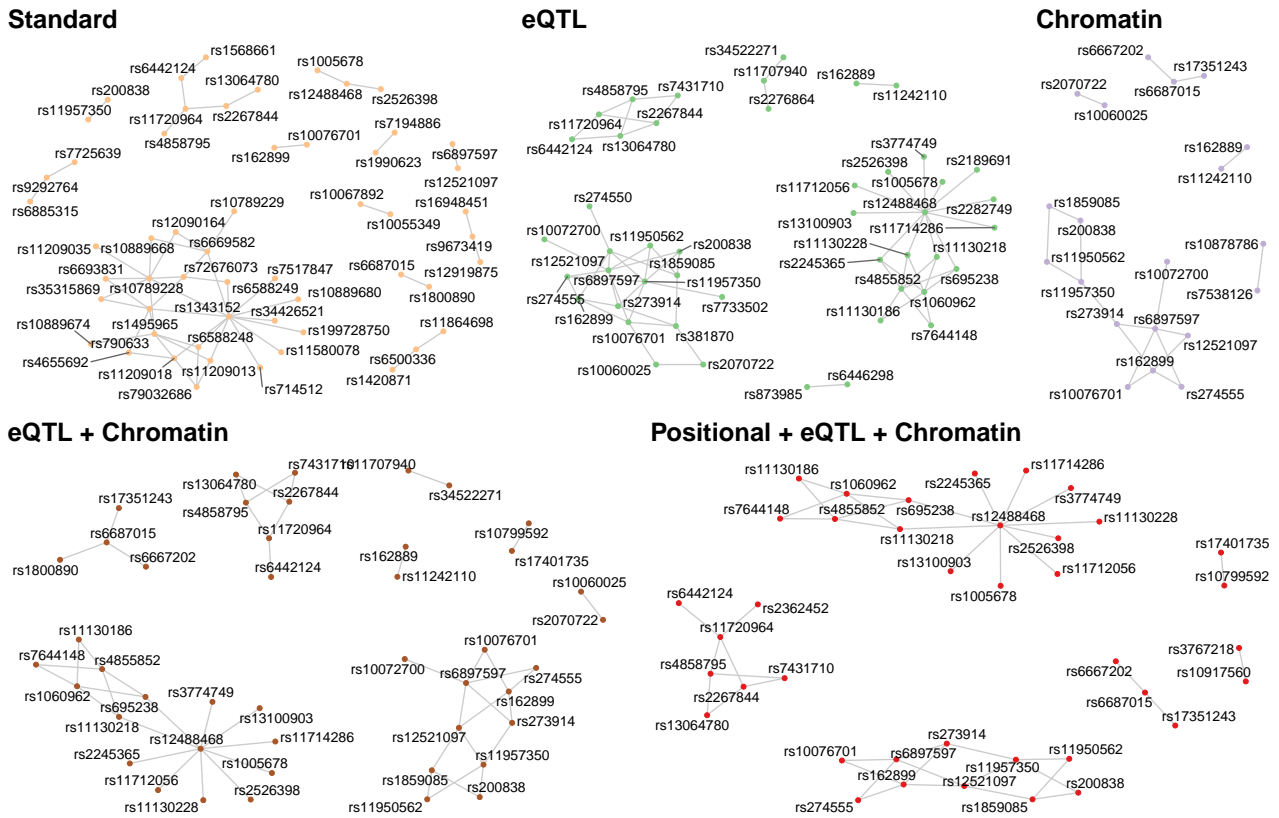


Fig. 1: Epistasis networks built from the significant SNP models of the different analysis (Section ??). The *Positional* analysis is absent, as no SNP model was significant.

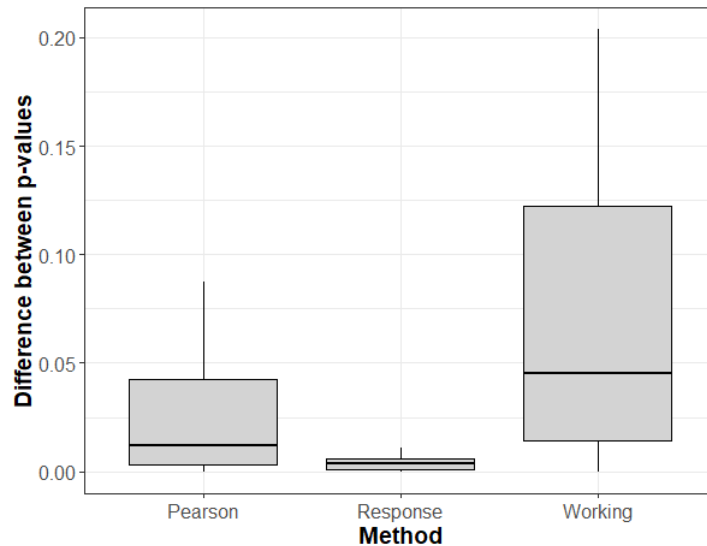


Fig. 2: To choose the best way of computing residuals in order to obtain the phenotype adjusted for population structure, we randomly extracted five SNPs in the dataset (rs12488468, rs1005678, rs11714286, rs2267844, rs11720964) and compared the associated outputs of epistasis detection. First, we computed the different residuals: we ran a logistic regression model with binary phenotypes as response variable and 7 PCs as independent variables. We derived three vectors of adjusted phenotypes from response, working and Pearson residuals. Then, we looked for statistical epistasis: we computed three linear models using the different residuals as response variable and SNP interactions as dependent variables. Finally, we performed logistic regressions with the binary phenotype as dependent variable, two SNPs and their interaction as explanatory variables, in addition to 7 PCs as covariates. We aimed at identifying the residuals leading to P-values as close as possible to the P-values from the logistic regression. P-values obtained with response residuals as phenotypes are the closest to the ones obtained with the logistic regression and are therefore selected as adjusted phenotypes in our analysis.