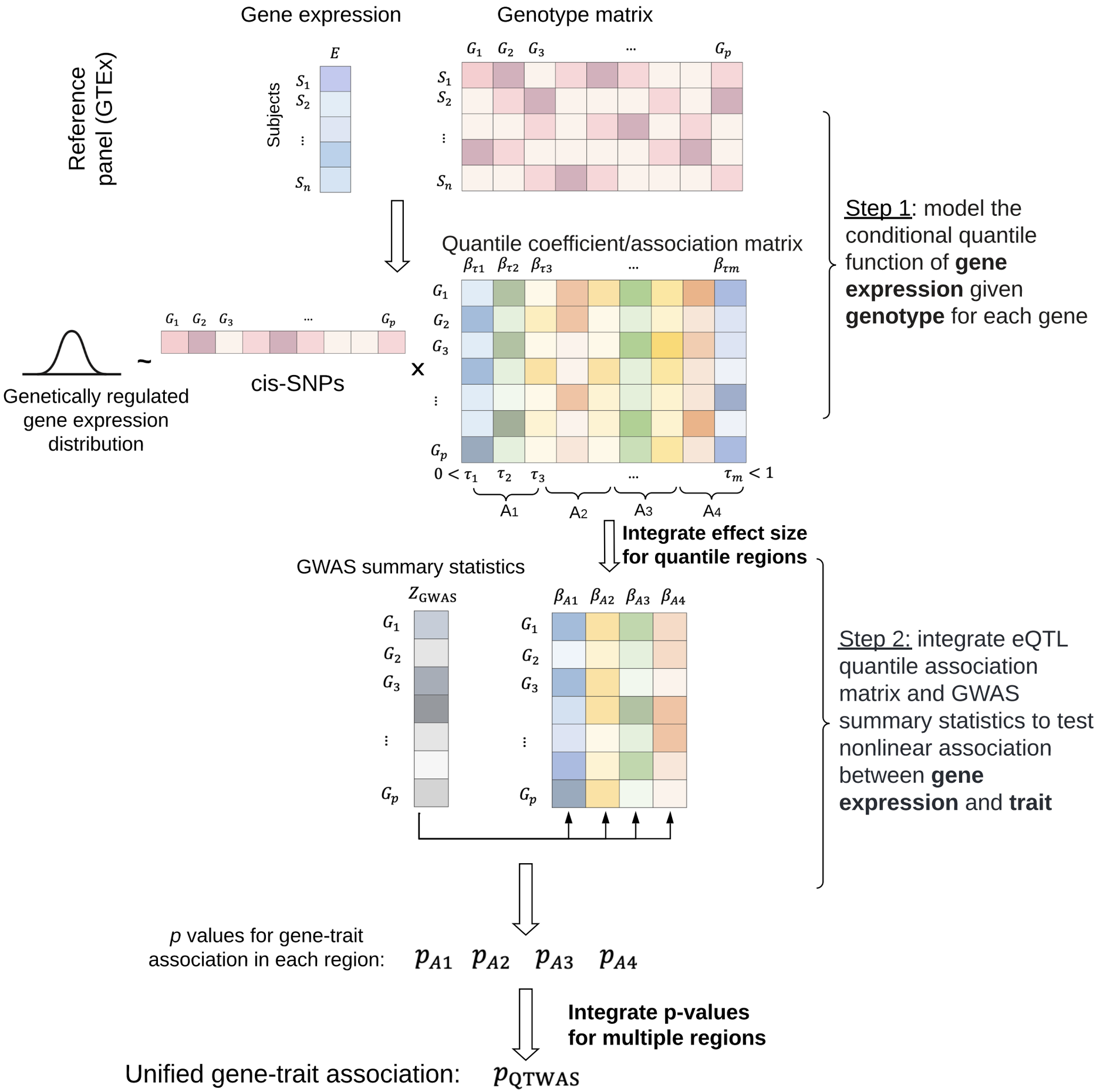
Reference panel (GTEx)
Gene expression
Genotype matrix
Subjects
Quantile coefficient/association matrix
cis-SNPs
Genetically regulated gene expression distribution
A1
A2
A3
A4
Integrate effect size for quantile regions
GWAS summary statistics
Step 1: model the conditional quantile function of gene expression given genotype for each gene
Step 2: integrate eQTL quantile association matrix and GWAS summary statistics to test nonlinear association between gene expression and trait
p values for gene-trait association in each region:
Integrate p-values for multiple regions
Unified gene-trait association: