

STAGE 1

STAGE 2

PHENOTYPE
METHODS

Filtering &
preprocessing

Normalization &
alignment

Downsampling

Statistical
analysis

Covariates
control

Partitioning

GENOTYPE
METHODS

Population-
based filtering

SNP-based
filtering &
grouping

UK BIOBANK
DISCOVERY (19644)
REPLICATION(16342)

→ GWAS Catalog
→ Psychiatric Genomics Consortium
→ Broad Institute

mvGWAS CCA

Discovery &
replication results
aggregation

Heritability &
confounding bias
detection

Tissue & cell-type
specific heritability
analysis

Genetic correlation
analyses

Gene-based
developmental and
functional analysis

GENOME-TO-PHENOTYPE
ASSOCIATION