**Guide to Alzheimer’s DNAm analysis**

*NOTE: All scripts run with v3.5 of R.*

1. **00\_load\_idats.R**

Description: This script imports .idat files with *minfi* and phenotype information into two R objects. “pd” and “RGset”.

Output files:

* *rdas/RGset\_n398.rda*

1. **01a\_preprocess\_methylation.R**

Description: This script preprocess the RGset. It involves dropping poor quality samples and filtering probes. It also generates negative control principal components (data-driven measures of technical variance) and cell-type proportion predictions.

Output plots:

* In the paper.
  + *qc/SupplementalFigure\_PredictedSex\_by\_MethylationIntensity.pdf*
  + *qc/SupplementalFigure\_medianIntensityPlot\_gsk\_n398.pdf*
  + *qc/SupplementalFigure\_beta\_distribution\_pre\_post\_SQN.pdf*
* Not in the paper.
  + *qc/qcPlot\_Region.pdf*
  + *qc/qcReport\_RegionDx\_n398.pdf*
  + *qc/qc\_by\_Sentrix\_4regions2.pdf*
  + *qc/beta\_distribution\_pre\_post\_SQN.pdf*
  + *qc/Distribution\_M\_vals\_and\_Beta\_vals\_PostSQN.pdf*

Output files:

* *rdas/MsetSQN\_prefiltered\_n394.rda*
* *rdas/MsetRaw\_prefiltered\_n394.rda*
* *rdas/RGset\_prefiltered\_n394.rda*
* *rdas/MSet\_SQN\_postfiltered.rda*
* *rdas/processed\_data\_postfiltered.rda*

1. **01b\_check\_genotype\_correlation\_meth450k\_vs\_SNPChip.R**

Description: Compare the 65 SNP genotypes present on the methylation 450k array to genotypes from these SNPs on LIBD SNP Chips.

Output plots:

* qc/SupplementalFigure\_pheatmap\_snpMismatchWithin\_methylation\_55SNP.pdf

Output files:

* qc/n398\_meth450k\_genotype\_problematic\_samples.xlsx

1. **01c\_check\_negative\_control\_PCs.R**

Description: This script computes the principal components of negative control probes (red and green) and checks the association with plate and lane technical variables. These principal components are later used as covariates to adjust for technical variance later.

Output plots:

* In the paper.
  + qc/SupplementalFigure\_top4\_negControl\_PCs.pdf
* Not in the paper
  + qc/Plate\_by\_Position\_PC1.pdf
  + qc/Plate\_by\_Position\_RN\_PC1.pdf
  + qc/Plate\_by\_Position\_PC2.pdf
  + qc/Plate\_by\_Position\_RN\_PC2.pdf
  + qc/negControlPC\_scatter.pdf

1. **01d\_pca.R**

Description: Principle component analysis of the probes used in analysis

Output plots:

* qc/SupplementalFigure\_alz\_brainRegion\_pca.pdf

Output files:

* rdas/pca\_alz.rda