

Title: Supplementary Data 1:

Description: Annotation of the SOMAmer probes.

Title: Supplementary Data 2:

Description: Replicated pQTM identified at the different steps of the pEWAS.

Title: Supplementary Data 3:

Description: pQTM identified and replicated at the different EWAS steps.

Title: Supplementary Data 4:

Description: pEWAS results – 98 replicated CpG-protein associations (pQTMs) after various regression steps.

Title: Supplementary Data 5:

Description: Enrichment of pQTM for various CpG site characteristics.

Title: Supplementary Data 6:

Description: EWAS atlas lookup of the 98 final pQTMs.

Title: Supplementary Data 7:

Description: Clinical phenotypes associated with pEWAS proteins (KORA data).

Title: Supplementary Data 8:

Description: Clinical phenotypes associated with pEWAS CpGs (KORA data).

Title: Supplementary Data 9:

Description: Metabolites associated with pQTM CpG sites (QMDiab data).

Title: Supplementary Data 10:

Description: Replication of previously reported pQTMs (Ahsan *et al.* [7]).

Title: Supplementary Data 11:

Description: NLRC5 (cg07839457) to protein associations (KORA) at relaxed significance level ($p=0.05/1,123$).

Title: Supplementary Data 12:

Description: Comparison of our successive residuals method to a joint one-step regression.