



**Supplementary Figure 3: Cell type prioritization by GaiaAssociation analysis is unaffected**

**by the GWAS SNP p-value threshold.** Cell type prioritization by GaiaAssociation was

compared between GWAS variants from the EMBL-EBI GWAS catalog possessing a p-value  $\leq$

$5.0 \times 10^{-8}$  (x-axis) and  $\leq 1.0 \times 10^{-5}$  (y-axis) across 44 cell type regulatory regions. Studies

highlighted in **Figure 2b** (labelled **a-f**) and three additional studies from **Figure 2a** – systemic

lupus erythematosus (**g**), leukocyte count (**h**), and inflammatory bowel disease (**i**) – were used

for comparative analysis. Cell type prioritization between variants from both p-value groups

demonstrated strong concordance and positive association ( $R^2$  ranges: 0.82 - 0.996) providing

evidence that SNP selection by p-value threshold does not influence the selection of cell type.

Cell types colored in red received an RLEA p-value  $\leq 0.001$  and achieved multiple testing significance with variants from both p-value thresholds. Cell types colored in pink and green received a RLEA p-value of  $\leq 0.05$  and  $> 0.05$ , respectively. The linear diagonal trendline (dashed red line) indicates that the 44 cell types were ranked analogously between both variant groups. Notably, the most highly ranked cell type (labelled in each plot) was concordant between both p-value groups across all nine GWAS studies.