

**Title: Supplementary Data 1:**

Description: Autoimmune disease associated genetic variants in *IRF8* locus with genome-wide significance

**Title: Supplementary Data 2:**

Description: SNPs in tight LD ( $r^2 > 0.8$ ) with tag variants

**Title: Supplementary Data 3:**

Description: Analysis of the enhancer marks of genetic variants in different immune cell subpopulations

**Title: Supplementary Data 4:**

Description: Differential gene expression list between WT group and KO group

**Title: Supplementary Data 5:**

Description: The list of genes whose promoter exists interaction with rs2280381 site

**Title: Supplementary Data 6:**

Description: RNA sequencing analysis of the expression of genes whose promoter exists interaction with rs2280381 site

**Title: Supplementary Data 7:**

Description: RNA sequencing analysis of the expression of the direct targets of IRF8 predicted by IPA analysis and IRF8 ChIP-Seq in monocytes

**Title: Supplementary Data 8:**

Description: GO pathway analysis for the differentially expressed genes

**Title: Supplementary Data 9:**

Description: DAPA-MS experiment and ChIP-seq identified proteins binding to the rs2280381 sequence

**Title: Supplementary Data 10:**

Description: The genomic regions exist connection with IRF8 promoter detected by 4C-seq