These are scripts for the manuscript analyses submitted in Github. The subtitle of the scripts was added before each code segment.

GSE14795 data processing: The raw data was merged as GSE41177.probe\_exprs. Then, the deg of GSE14795 dataset was analyzed.

GSE31281 data processing: The raw data was merged as GSE31281.probe\_exprs. Then, the deg of GSE31281 dataset was analyzed.

GSE14975 data processing: The raw data was merged as GSE14975.probe\_exprs. Then, the deg of GSE14975 dataset was analyzed.

GSE79768 data processing: The raw data was merged as GSE79768.probe\_exprs. Then, the deg of GSE79768 dataset was analyzed.

SLE (GSE50772) data processing: The raw data was merged as GSE50772.probe\_exprs. Then, the deg of GSE50772 dataset was analyzed.

Supplementary Figure 2: The merging and batch correction of AF datasets was performed. The PCA plot of AF datasets before and after batch correction.

Figure 1: The deg analysis of AF datasets. The heatmap plot and volcano plot of AF datasets. The deg analysis ana analysis of SLE datasets. The heatmap plot and volcano plot of SLE datasets.

Figure 2: WGCNA analysis of AF dataset and SLE dataset.

Figure 3: The blue module genes from SLE and turquoise module genes from AF were emerged and the he turquoise genes from SLE and turquoise module genes from AF were emerged respectively for PPI analysis. the top 50 important nodes from each network property were screened. 51 hub genes were identified as PPI in code.

Figure 4: 69 core genes were identified as DEG\_PPI. GO and KEGG analysis of 69 core genes.

Figure 6: Lasso analysis of SLE and AF dataset. SYM-RFE analysis of SLE and AF.

Supplementary Figure 3: ssGSEA analysis of SLE dataset. The lollipop chart showed correlation between the expression of 3 hub genes and immune cell infiltration in SLE.

Supplementary Figure 3: ssGSEA analysis of AF dataset. The lollipop chart showed correlation between the expression of 3 hub genes and immune cell infiltration in AF.

Figure 7: GSEA analysis of TMEM45A. GSEA analysis of single pathway.