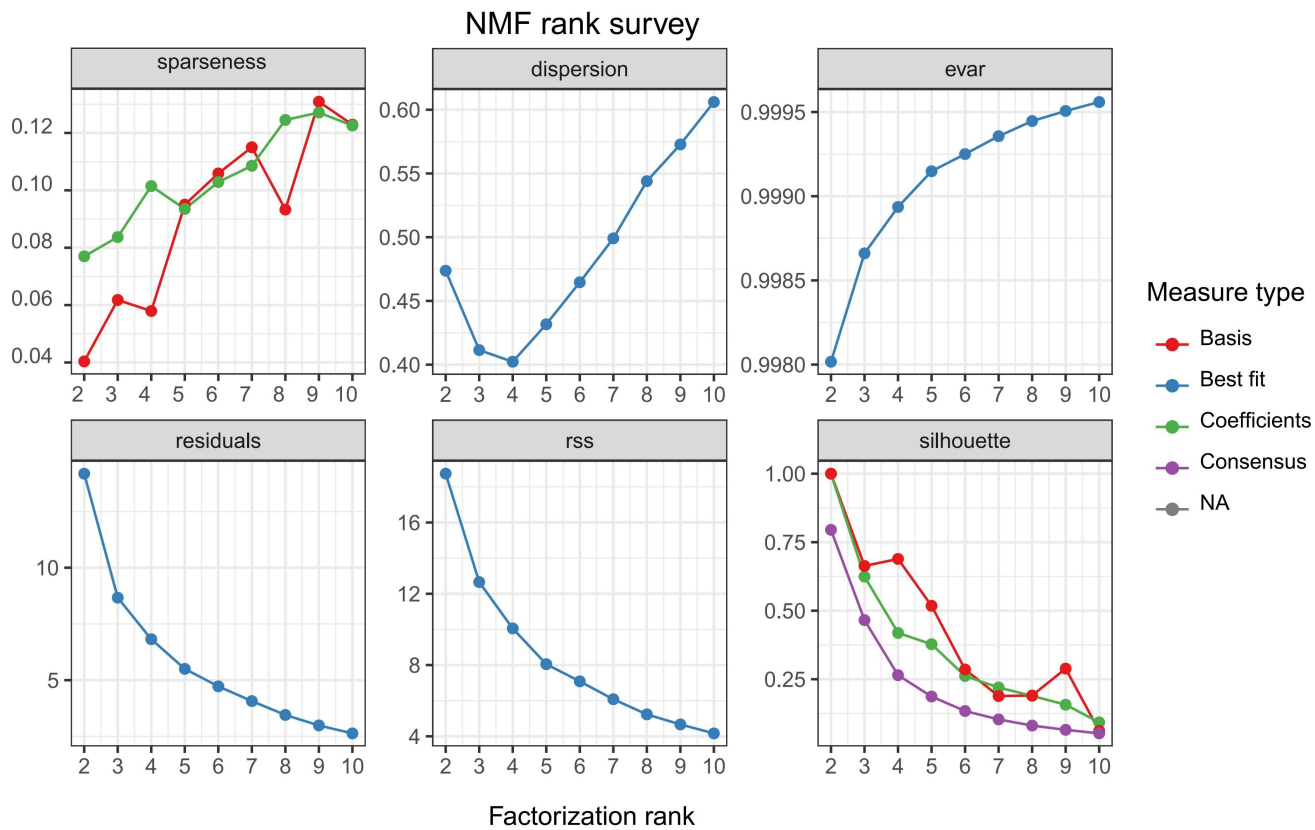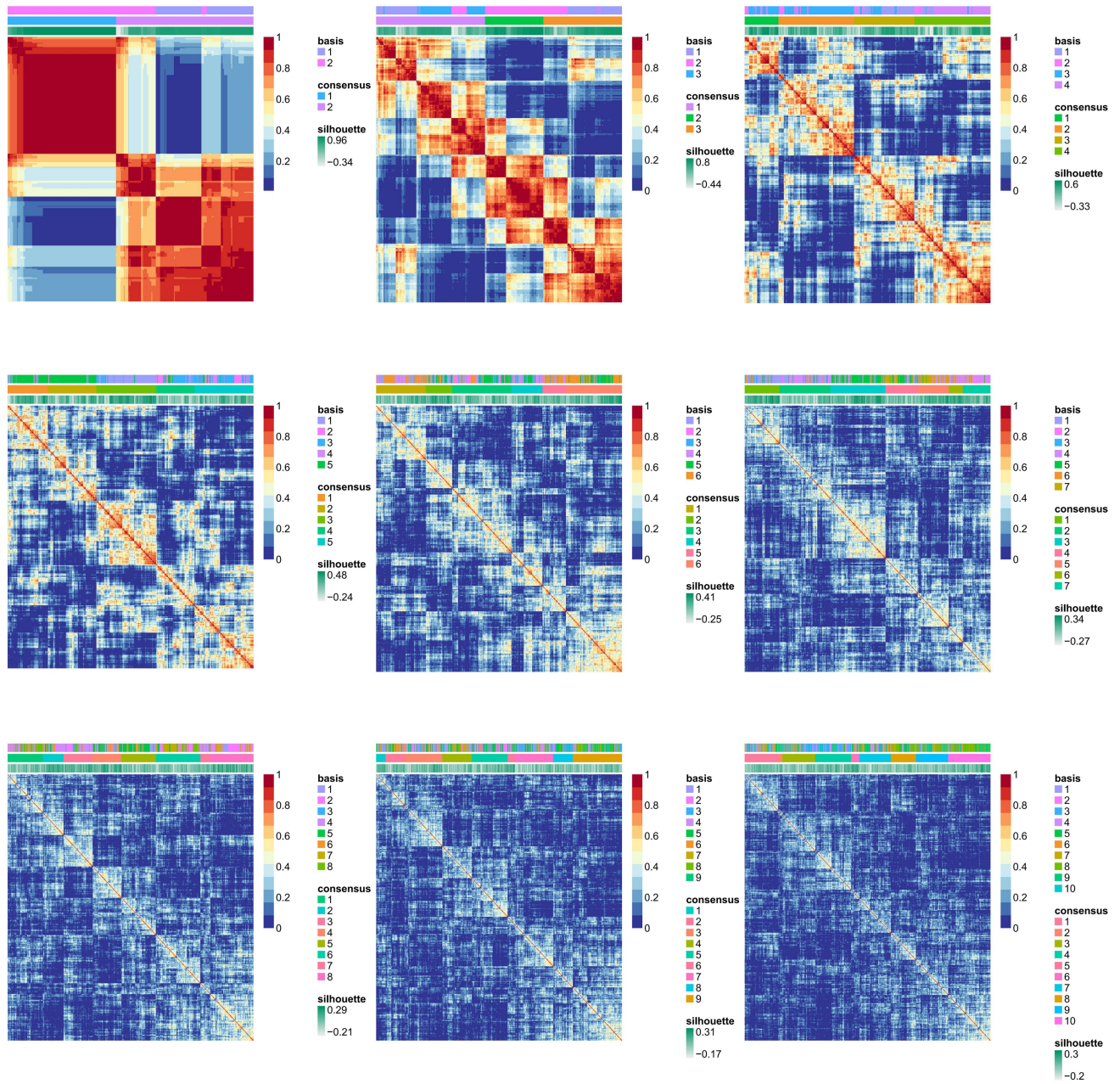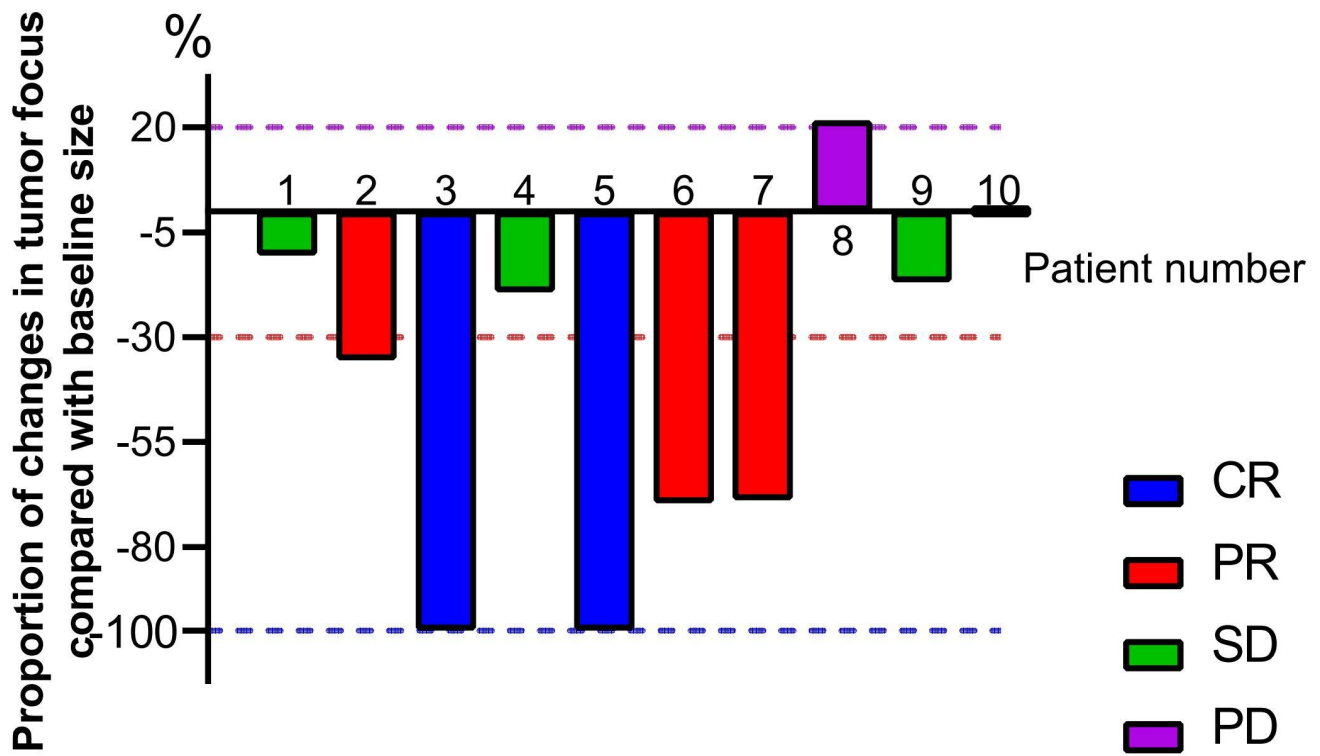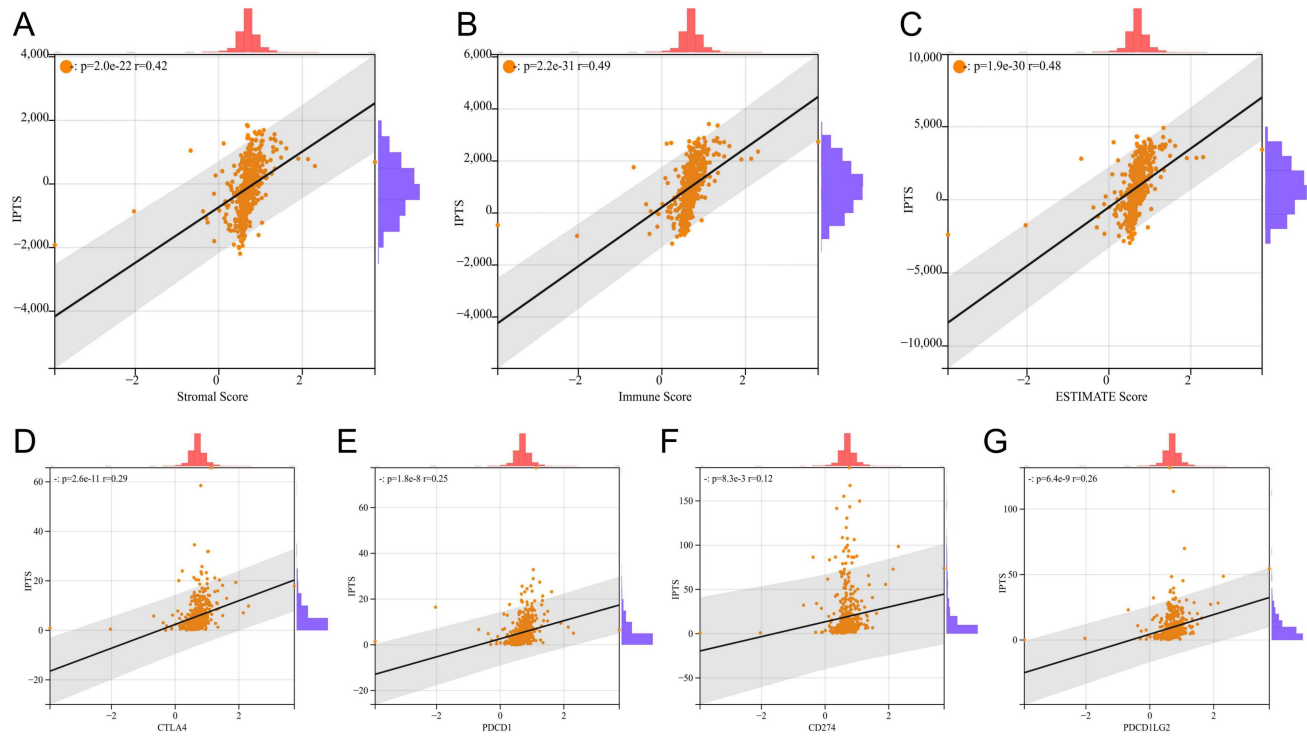# *Supplemental figures*

Supplementary Figure 1. The NMF rank survey at a rank of 2 to 10.

Supplementary Figure 2. All heatmaps of the training set with the number of clusters ranged from 2 to 10.

Supplementary Figure 3. The ten patients' best response evaluation in our independent LUSC cohort according to response evaluation criteria in solid tumours (RECIST, v1.1).

Supplementary Figure 4. Correlation analysis between IPTS and (A) stromal score, (B) immune score, (C) ESTIMATE score, (D) CTLA4 TPM value, (E) PDCD1 (PD-1) TPM value, (F) CD274 (PD-L1) TPM value, and (G) PDCD1LG2 (PD-L2) TPM value.