

Figure S1. External cohort Kaplan-Meier analyses by RScore-Expr group. Kaplan-Meier OS curves for (A) GSE10846, (B) GSE31312, (C) GSE32918 and (D) GSE87371 are shown using cohort-specific median splits of RScore-Expr, such that patients were dichotomized into high- and low-score groups according to the median value within each cohort. Kaplan-Meier PFS curves for (E) GSE31312 and (F) GSE87371 were generated in the same way. Cohort-specific median splitting was used for these supplementary Kaplan-Meier visualizations when applying the fixed discovery cutoff to an external cohort placed all samples on one side of the threshold and therefore did not produce both a high-score and a low-score group. These supplementary Kaplan-Meier plots were included only to visually display score separation after cohort-specific median dichotomization; the primary external-validation analysis modeled RScore-Expr as a continuous predictor. OS, overall survival; PFS, progression-free survival.

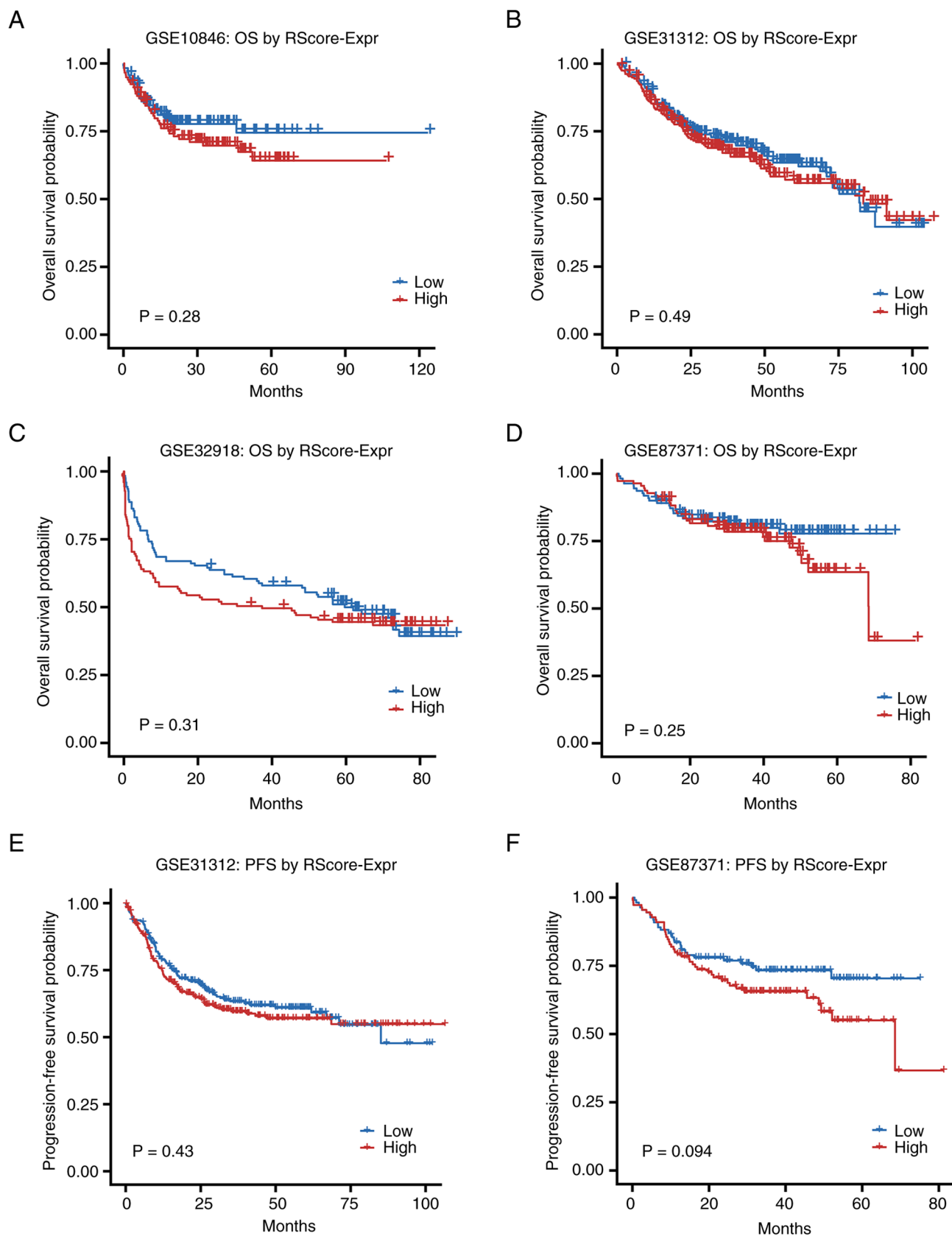


Figure S2 External calibration of continuous RScore-Expr models. Calibration plots for 60-month OS in (A) GSE10846, (B) GSE31312, (C) GSE32918 and (D) GSE87371. Calibration plots for 36-month PFS in (E) GSE31312 and (F) GSE87371. OS, overall survival; PFS, progression-free survival; SD, standard deviation.

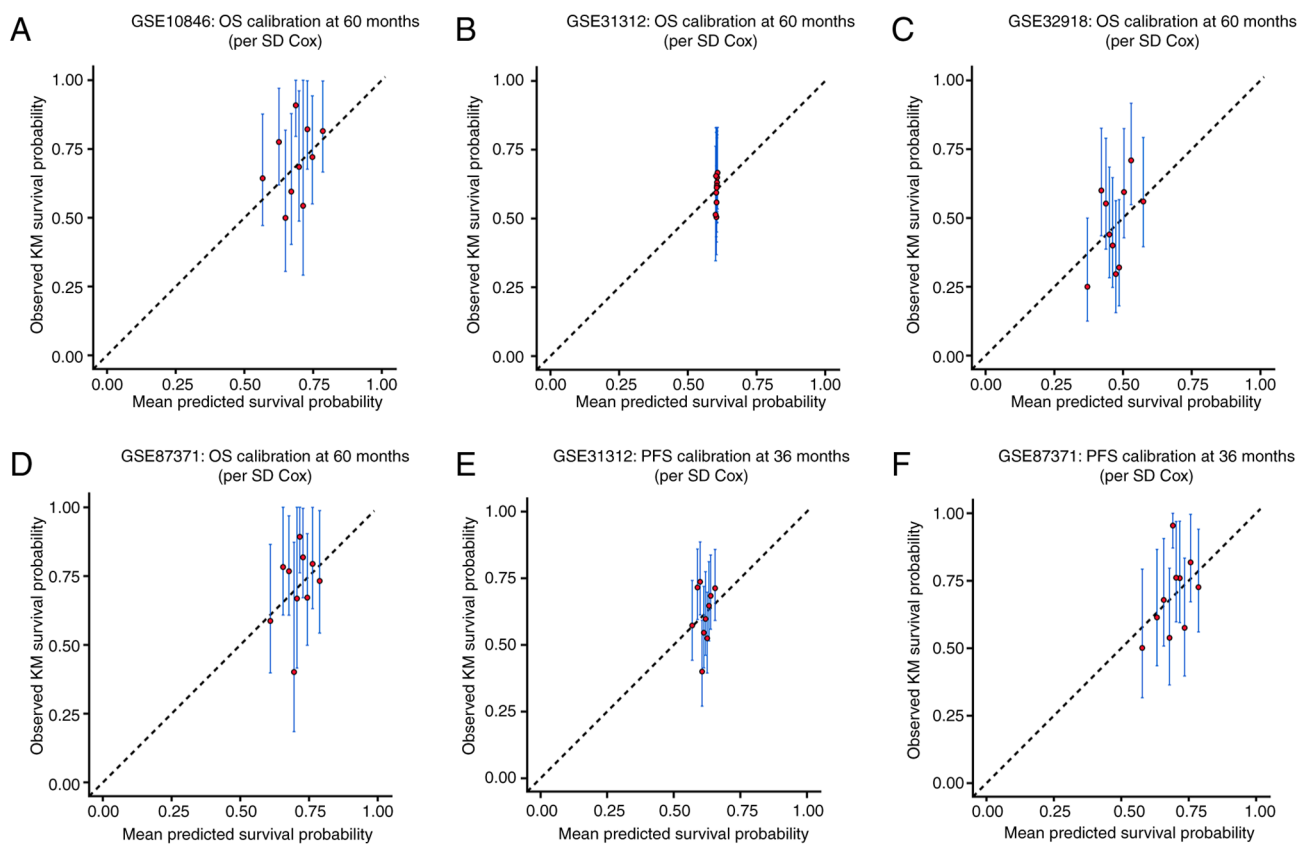


Figure S3. ESTIMATE-based microenvironment sensitivity analyses. Spearman correlations between IEAI and ESTIMATE-derived tumor purity, stromal score, immune score and ESTIMATEScore in the full cohort and discovery cohort. IEAI, immune evasion-associated index.

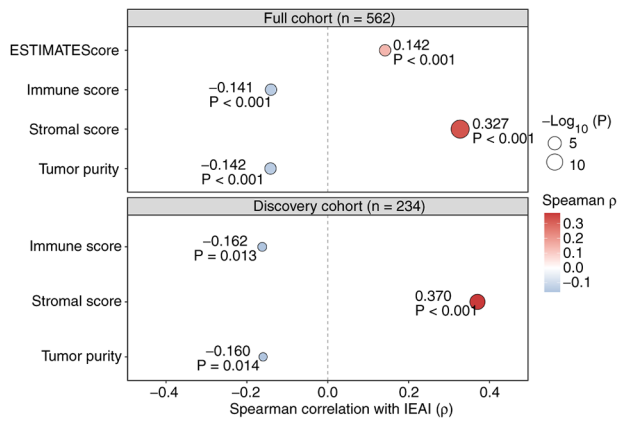


Figure S4. Expression of selected antigen-processing and immune evasion-associated genes in IEAI-high versus IEAI-low cases in the discovery cohort. IEAI, immune evasion-associated index.

