



Figure S1 Correlation between key findings and GBM transcriptional subtypes. (A) Violin plot showing SOX21-AS1 expression across classical, proneural, and mesenchymal GBM subtypes. (B) Violin plot of CD274 expression across GBM subtypes. (C) Violin plot of PD-1 expression across GBM subtypes. (D) Violin plot of 19-lncRNA risk score distribution across GBM subtypes. (E) Bar chart showing the proportion of high- and low-risk patients in each GBM subtype. (F) Scatter plot of SOX21-AS1 vs. CD274 expression in TCGA GBM samples. (G) Heatmap of z-score normalized expression of 19 hub lncRNAs, with samples colored by risk group and GBM subtype.

