**Supplementary Figure Legends**

**Supplementary Figure S1.** Lentiviral vector sequence pCDH-CMV-MCS-EF1-GFP+Puro.

**Supplementary Figure S2.** Lasso analysis and Cox model to screen prognosis-related genes affecting LUAD. A, B) Lasso regression λ and model regression coefficient plots (A) and cross-validation plots (B) of LUAD patients in the TCGA database; C) Cox model identify genes related to LUAD prognosis; D) Survival curves of high-risk and low-risk groups of patients in the training group and the test group based on the Cox model; E) ROC curves of risk scores in the training group and the test group in the Cox model; F) Risk curve plot of the training group; G) Risk curve plot of the test group; H) Venn diagram showing the intersection of AAGs, DEGs, and Lasso analysis candidate genes; I) Relationship curve between HMGA2 expression and patient survival in TCGA-LUAD data, with 541 patient samples.

**Supplementary Figure S3.** HMGA2 induces neoangiogenesis and promotes LUAD metastasis by activating the IGFBP2 expression and the PI3K/AKT/VEGFA signaling pathway.