

Fig. S1 Identification of the most clear cell renal cell carcinomas (ccRCC)-related gene module in The Cancer Genome Atlas-Kidney Renal Clear Cell Carcinoma (TCGA-KIRC) using the weighted gene co-expression network analysis (WGCNA) method. (a) Scale-free network map. (b) Mean connectivity network map. (c) Network heatmap of genes clustered in different modules. (d) Correlation between important ccRCC genes and genes in the blue module. (e) Correlation between important ccRCC genes and genes in the grey module. (f) Correlation between important ccRCC genes and genes in the turquoise module.

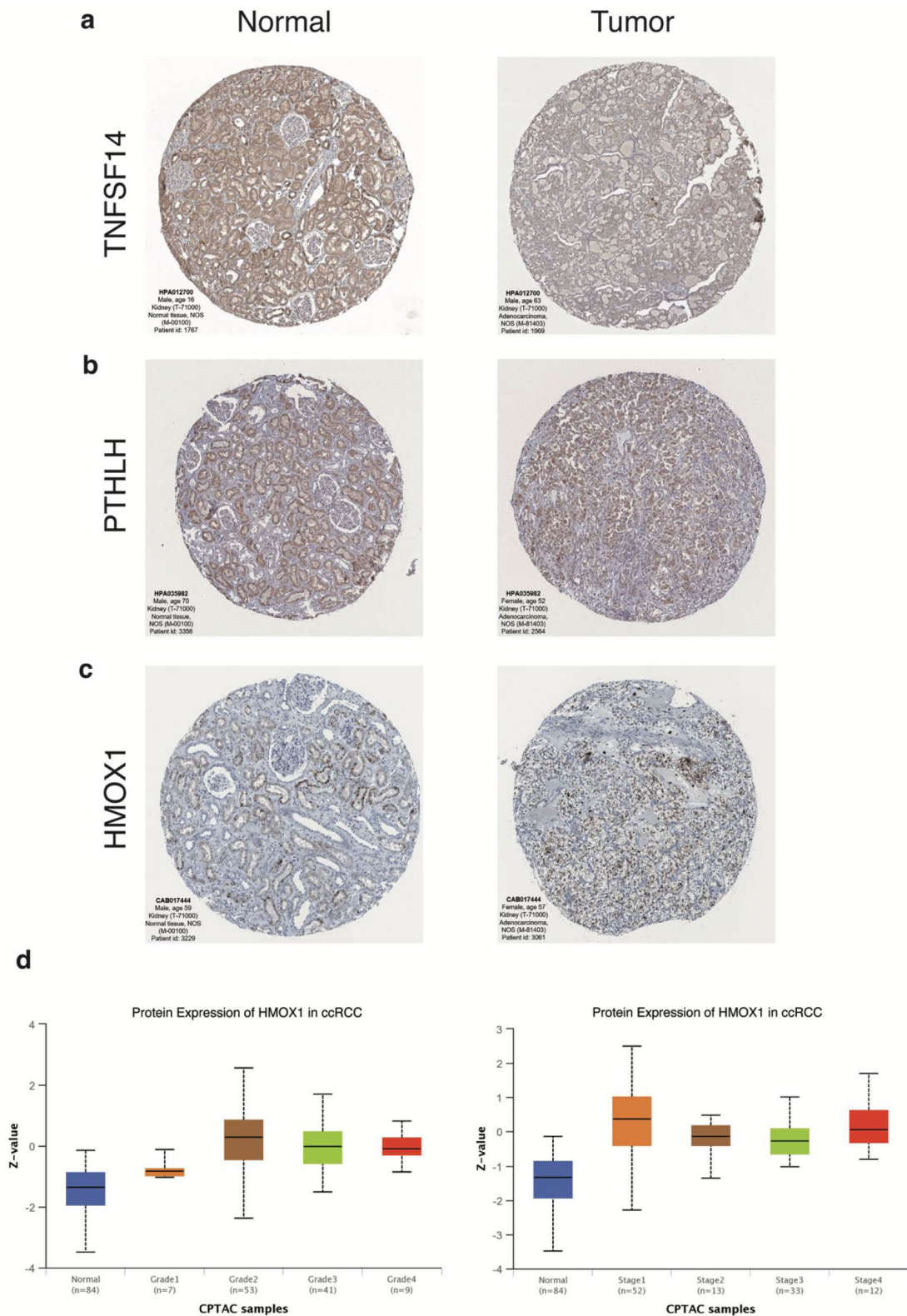


Fig. S2 Immunohistochemical analysis examines the specific overexpression of pyroptosis, apoptosis, and necroptosis (PANoptosis)-index (PANI) constituent genes tumour necrosis factor superfamily protein 14 (*TNFSF14*), parathyroid hormone like hormone (*PTHLH*), and heme-oxygenase 1 (*HMOX1*) in ccRCC. (a) Immunohistochemical comparison of *TNFSF14* expression in normal renal tissue and ccRCC. (b) Immunohistochemical comparison of *PTHLH* expression in normal renal tissue and ccRCC. (c) Immunohistochemical comparison of *HMOX1* expression in normal renal tissue and ccRCC. (d) Immunohistochemical comparison of *HMOX1* expression in ccRCC tissues with different grades and stages.

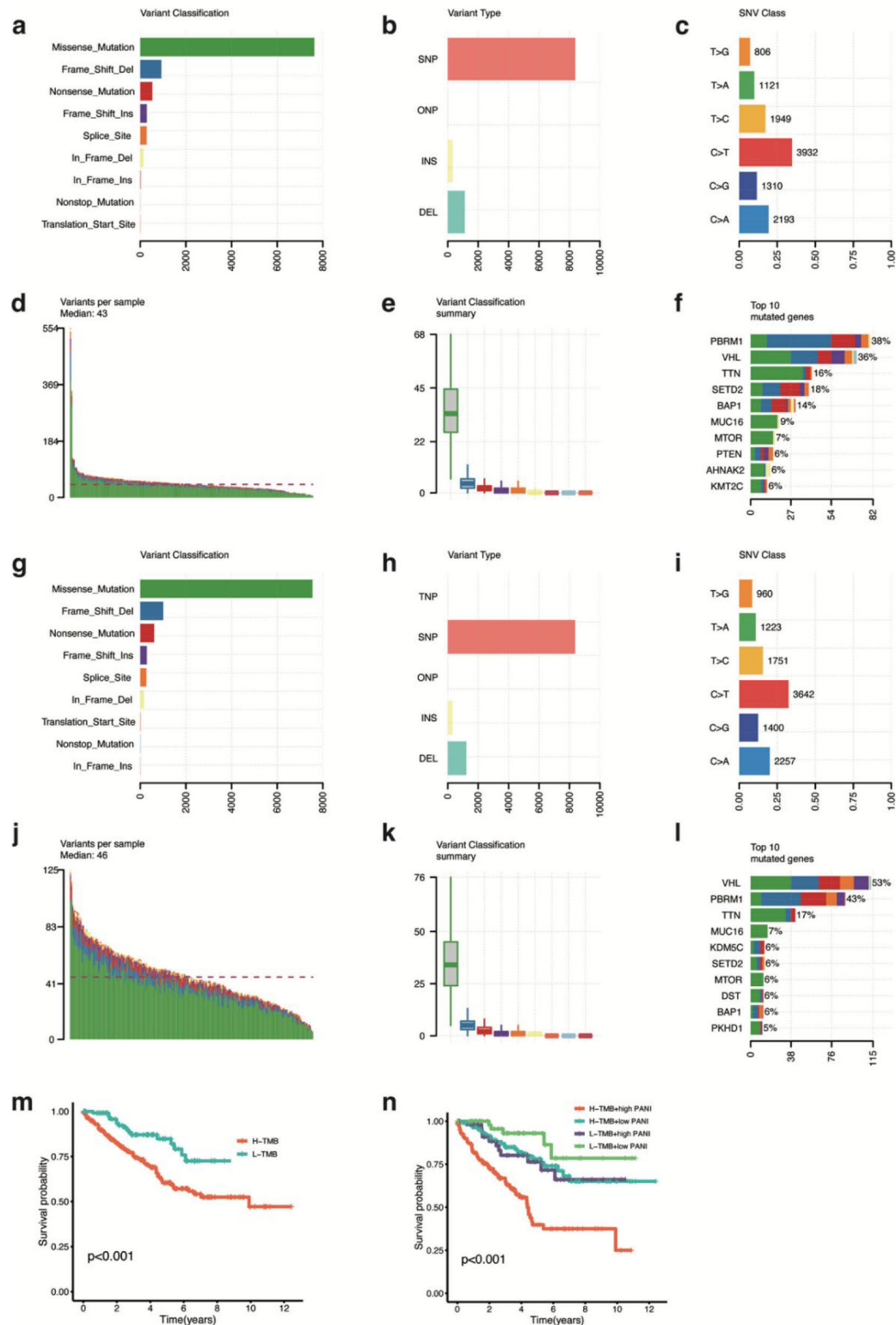


Fig. S3 Variant landscape of High- pyroptosis, apoptosis, and necroptosis (PANoptosis)-index (PANI) group and Low-PANI group. (a, g) Variant Classification of High (*H*)-PANI group (a) and Low (*L*)-PANI group (g). (b, h) Variant Classification of High-PANI group (b) and Low-PANI group (h). (c, i) SNV Classification of High-PANI group (c) and Low-PANI group (i). (d, j) Variants per sample summary of High-PANI group (d) and Low-PANI group (j). (e, k) Variant Classification summary of High-PANI group (e) and Low-PANI group (k). (f, l) Variant Classification of High-PANI group (f) and Low-PANI group (l). (m) The Kaplan-Meier (K-M) curve showing the overall survival (OS) difference between H-tumor mutational burden (TMB) and low (*L*)-TMB group. (n) K-M curve showing the OS difference under different PANI and TMB groupings.

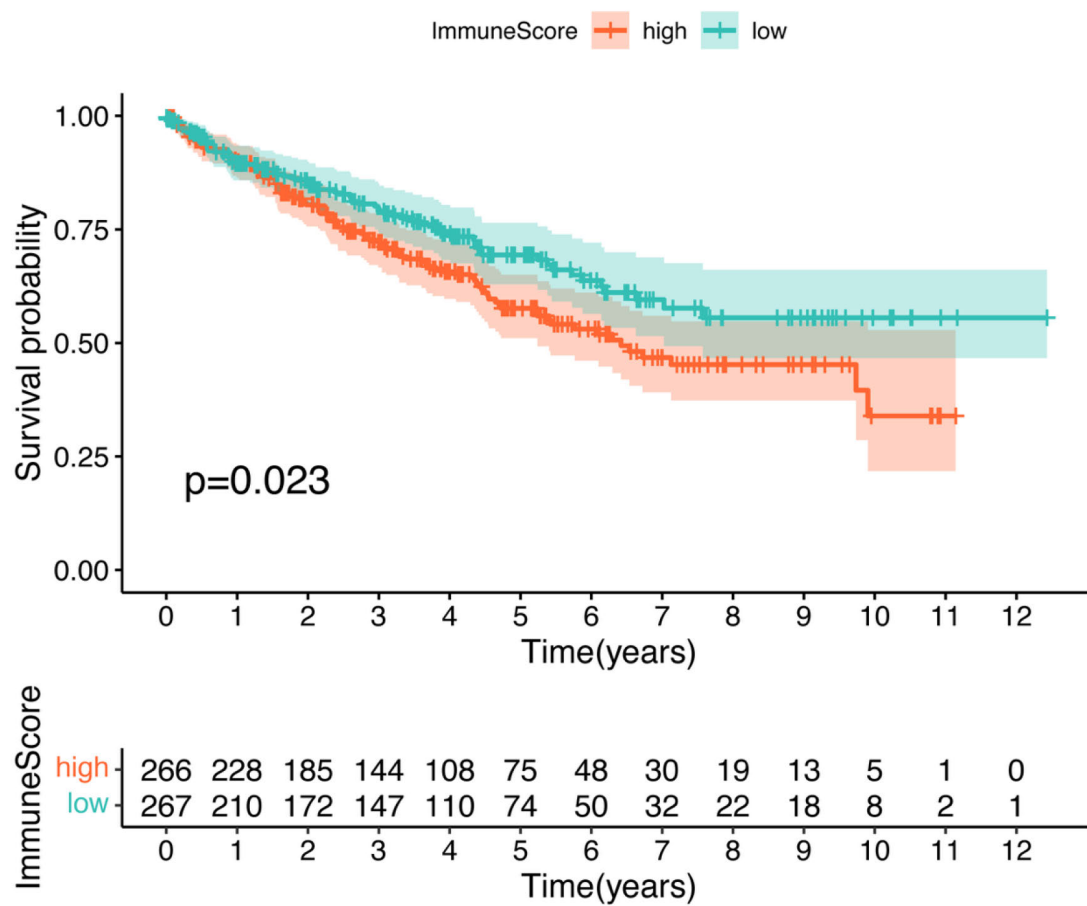


Fig. S4 The Kaplan-Meier (K-M) curve shows the overall survival (OS) difference between the high ImmuneScore group and the low ImmuneScore group.