

Figure S1. Expression of 26 α -ketoglutarate-related genes in The Cancer Genome Atlas-Stomach Adenocarcinoma tumor and adjacent tissue dataset. T, tumor; N, normal.

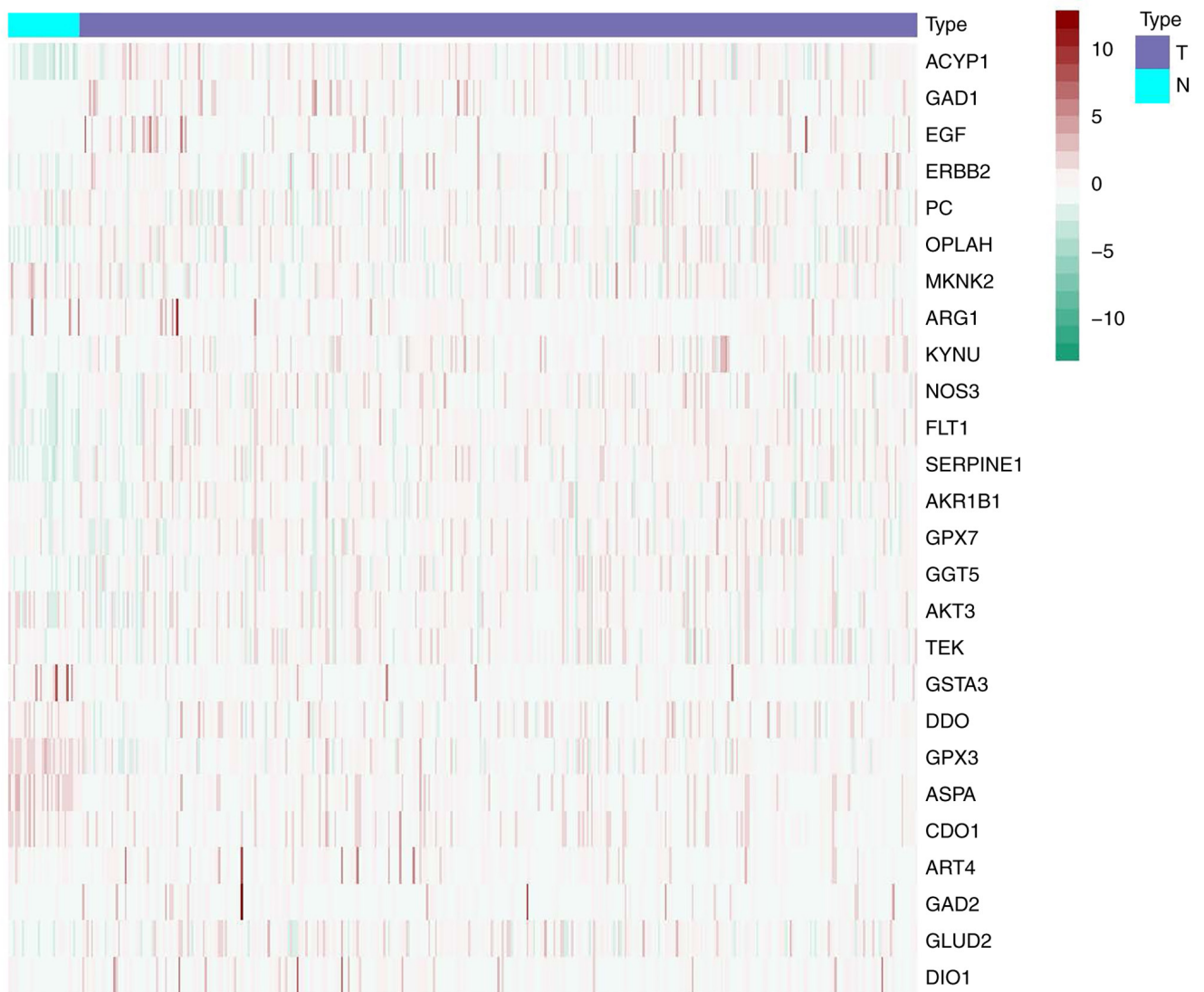


Figure S2. surv_cutpoint and overall survival curves of 3 GSE cohorts.

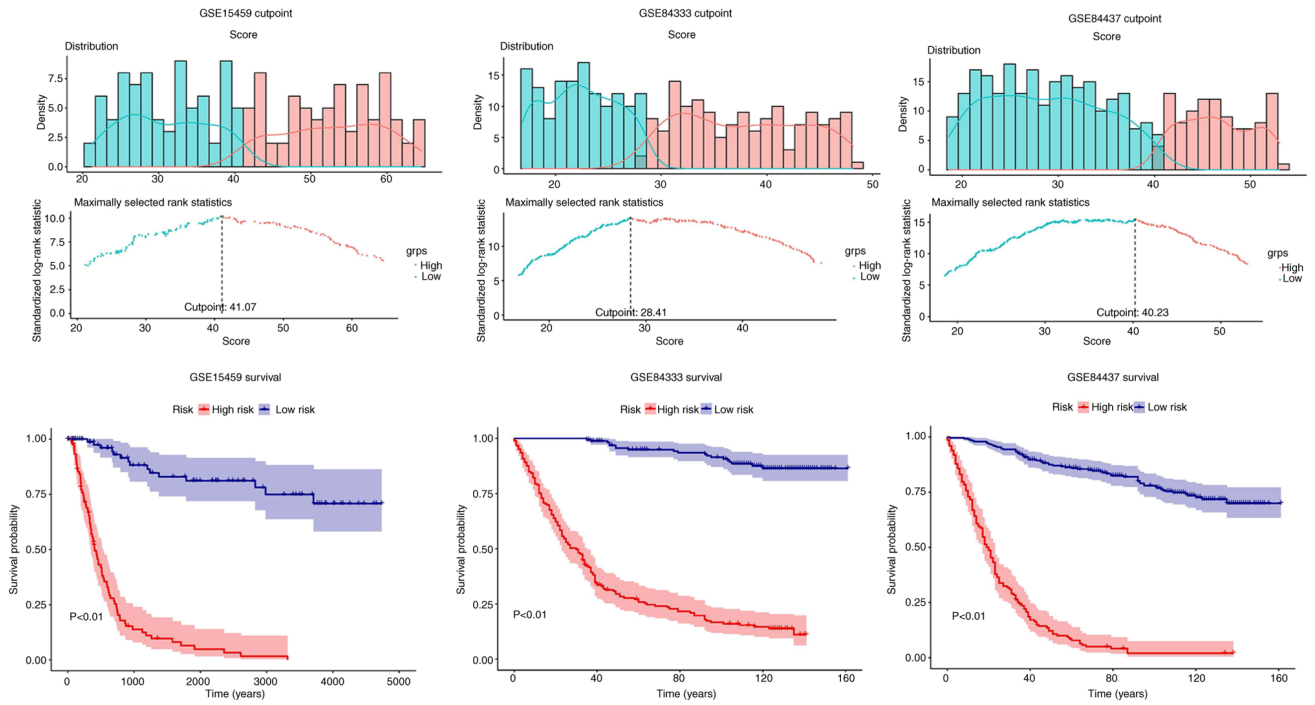


Figure S3. Nomogram based on regression analysis, demonstrating the significance of different clinical characteristics and the AKGI, with the 1-, 2- and 3-year prognoses calculated. **P<0.01; ***P<0.001. AKGI, α -ketoglutarate index; N, lymph node; M, metastasis; T, tumor; OS, overall survival; PR, predicted.

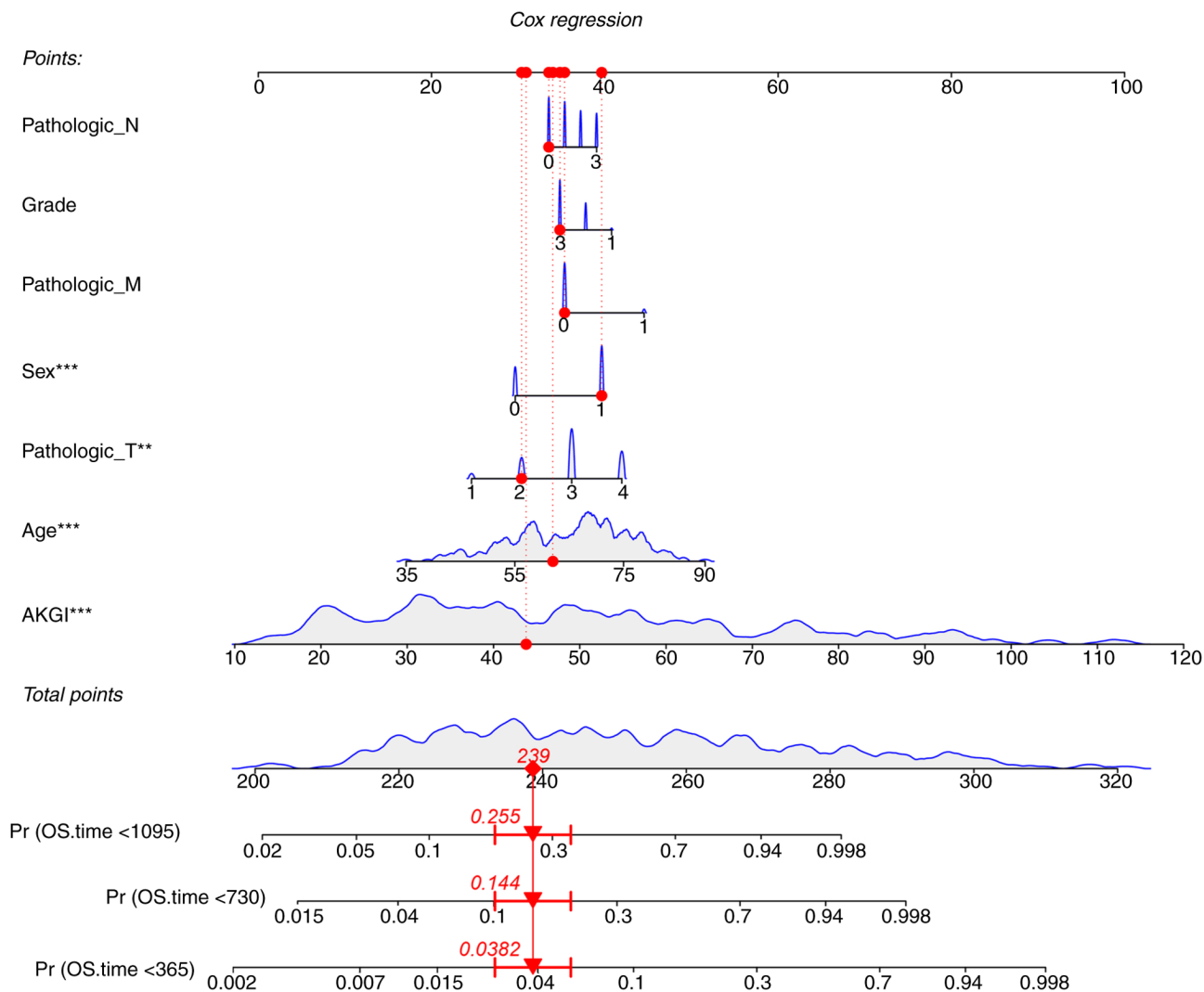


Figure S4. Genesets significantly associated with the AKGI. AKGI, α -ketoglutarate index; mRNA_{si}, mRNA stem index; mDNA_{si}, DNA methylation-based stem index; MDSC, myeloid-derived suppressor cells; TAM, tumor-associated macrophage; CAFs_EPCI, cancer-associated fibroblasts infiltration level by EPCI; EMT2, epithelial-mesenchymal transition 2; TMEscore, tumor microenvironment score.

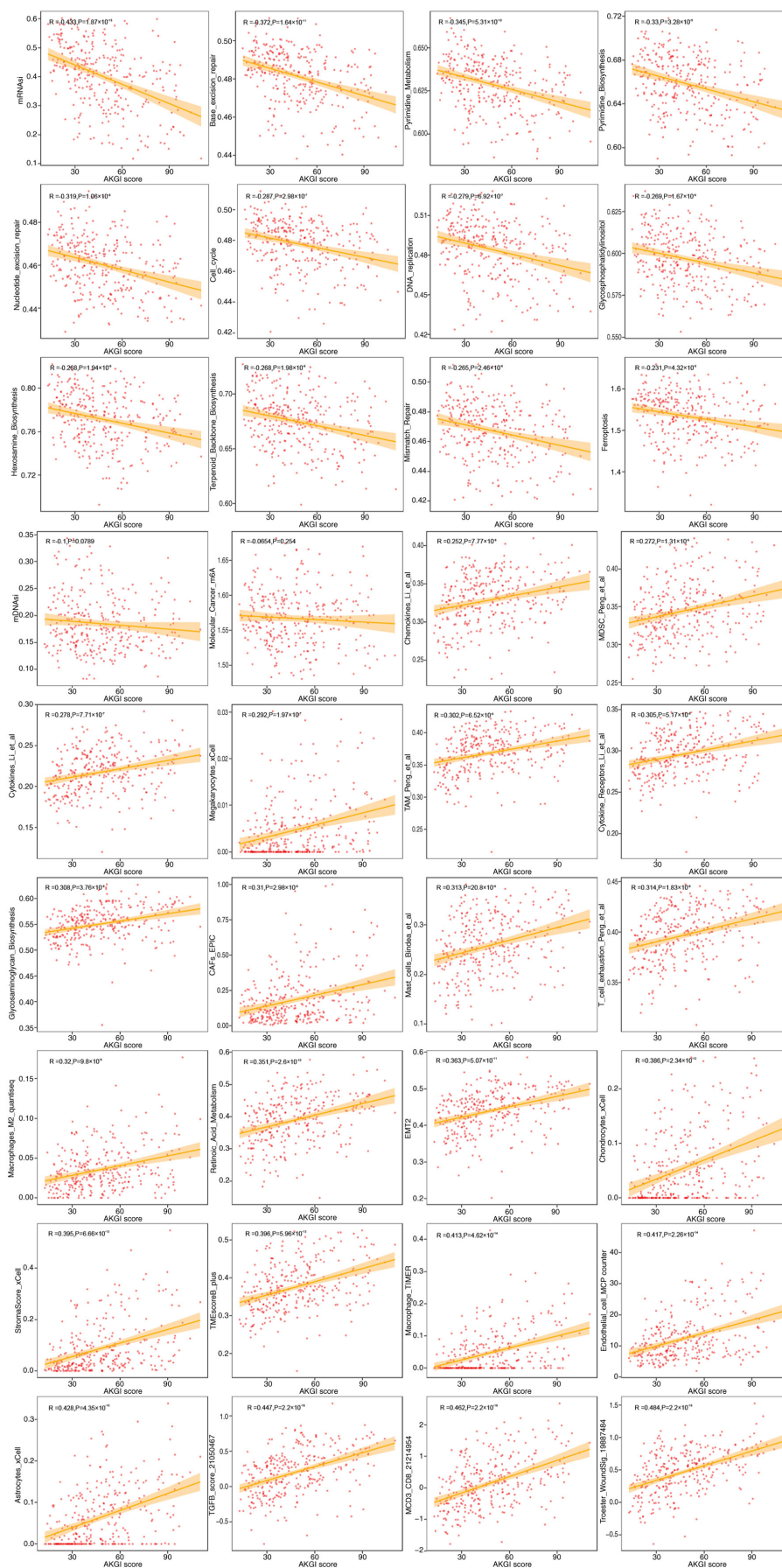


Figure S5. Cut-point diagram and RSF model of two treatment cohorts. RSF, random survival forest.

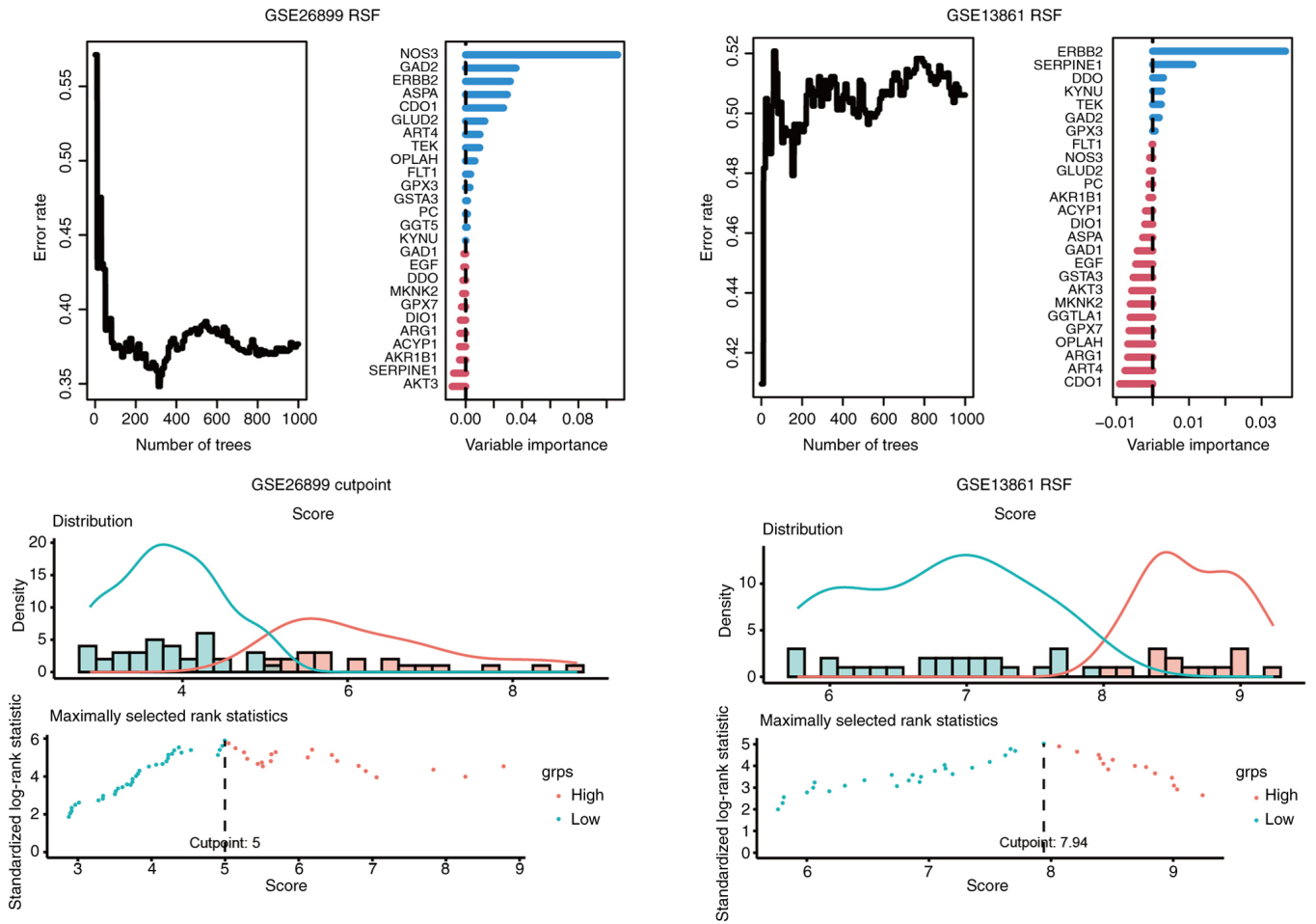


Figure S6. Validation of experimental results of MKN74 cells treated with α -KG. (A) Viability of MKN74 cells. Representative and quantitative results of (B) cell migration (x10 magnification), (C) cell invasion (x20 magnification) and (D) the clonogenicity assay. (E) Cell cycle distribution and percentage of cells in each cell cycle phase. (F) Representative FACS result of Annexin V/PI staining and the apoptosis rate. (G) Quantitative results of oxidative stress and ferroptosis-related biomarkers. (H) Reverse transcription-quantitative PCR results of apoptosis, oxidative stress and ferroptosis-related genes. ** $P < 0.01$; *** $P < 0.001$; **** $P < 0.0001$. α -KG, α -ketoglutarate; NC, negative control; SOD, superoxide dismutase; MDA, malondialdehyde; ROS, reactive oxygen species; Nrf2, nuclear factor erythroid 2-related factor-2; Keap1, Kelch-like ECH-associated protein 1; GPX4, glutathione peroxidase 4; SLC7A11, solute carrier family 7 member 11.

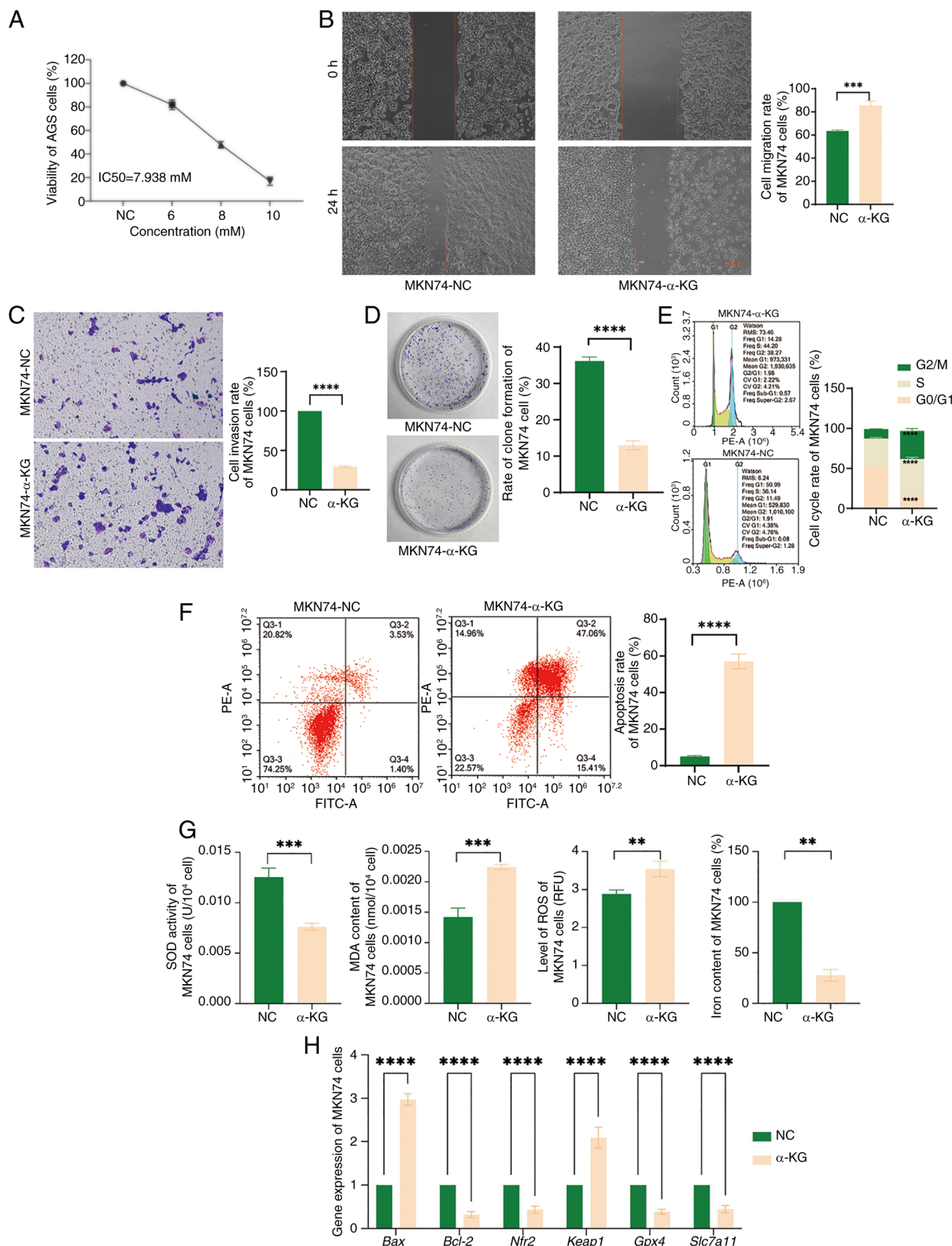


Figure S7. Detection of mitochondrial activity in MKN74 and AGS cells treated with α -KG. Representative and quantitative result of (A) MitoTracker and (B) JC-1 staining of MKN74 and AGS cells (x10 magnification) **P<0.01. α -KG, α -ketoglutarate; NC, negative control.

