

Figure S1. Visualization of differences in immune checkpoint expression between high- and low-risk groups. Heatmap comparing high-vs. low-risk tumors shows downregulated inhibitory receptors (BTLA, BTNL9, CTLA4, BTN2A2 and BTNL3) and upregulated co-inhibitory ligands (PVR, CD276 and VTCN1) in high-risk samples. Row-normalized expression values are color-scaled (blue=low, red=high). * $P < 0.05$, ** $P < 0.01$ by Student's t-test. TCGA, The Cancer Genome Atlas.

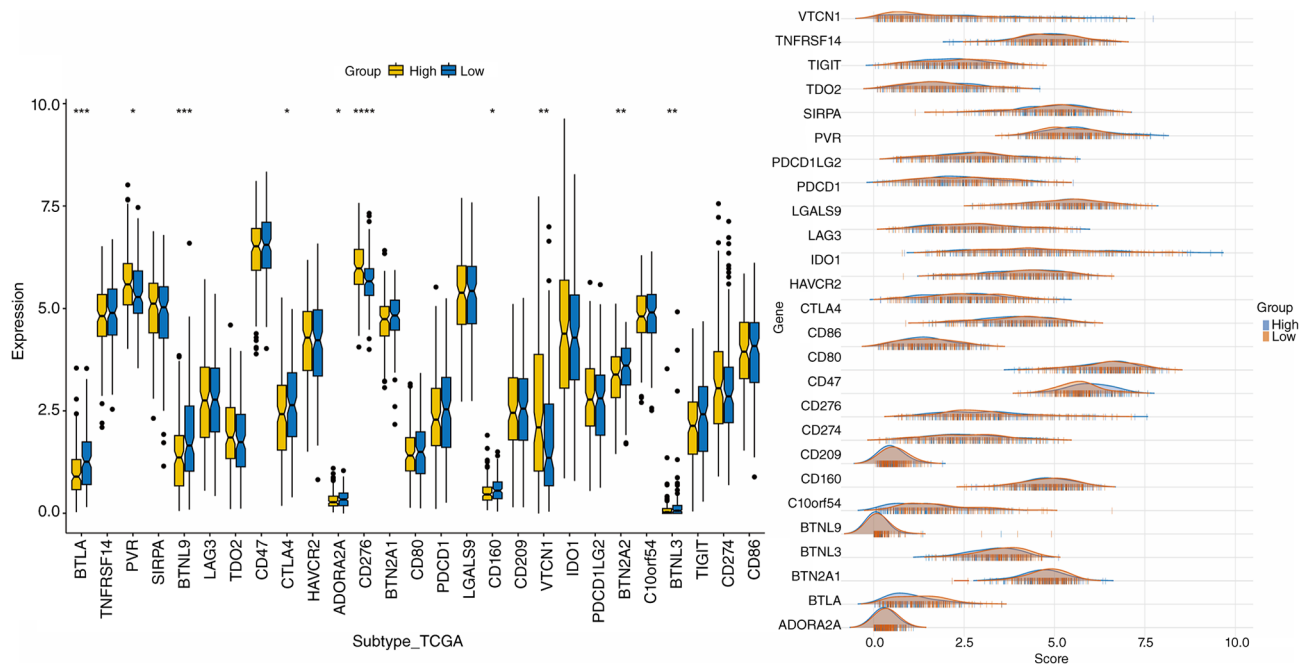


Figure S2. Correlation between the keratin risk signature and chemotherapeutic response in CellMiner. Scatter plots demonstrating significant negative correlations between high keratin risk scores and sensitivity to multiple chemotherapeutic agents, including HYPOTHEMYCIN ($r=-0.555$), MLN2480 ($r=-0.533$), AZ628 ($r=-0.503$), BGB283 ($r=-0.498$) and LXH-254 ($r=-0.488$; all $P<0.001$). Positive correlations were observed with everolimus ($r=0.442$). Each point represents an NCI-60 cell line; statistical analysis by Pearson correlation.

