



**Fig. S19.** Box plot of new gene-gene gravitation ( $G$ ) score when considering the gene cDNA length for five gene sets across 9 cancer types. The new gene-gene  $G$  score was recalculated using the average mutation rate per base pair (bp) in each cancer type normalized by gene cDNA length. Red: cancer driver genes (driver) versus non-cancer driver genes (non-driver); purple: Cancer Gene Census genes versus non-CGC genes; yellow: chromatin regulation factors (CRFs) versus non-CRFs; green: essential genes (essential) versus non-essential genes (non-essential); blue: DNA repair genes versus non-DNA repair genes. BRCA: breast invasive carcinoma, COAD: colon adenocarcinoma, GBM: glioblastoma multiforme, HNSC: head and neck squamous cell carcinoma, KIRC: kidney renal clear cell carcinoma, LUAD: lung adenocarcinoma, LUSC: lung squamous cell carcinoma, OV: ovarian serous cystadenocarcinoma, and UCEC: uterine corpus endometrial carcinoma.