



**Fig. S26.** The influence of gene average gravitation (aveG) scores changed by an important parameter Alpha during mutation network propagation in breast invasive carcinoma (BRCA). There is no propagation when  $\alpha=0$  and the mutation network propagation value of a gene is purely determined by the network structure when  $\alpha=1$ . Red: Cancer driver genes (Driver); purple: Cancer Gene Census (CGC) genes; yellow: Chromatin regulation factors (CRF); green: Essential genes (Essential); blue: DNA repair genes, and black: all genes.