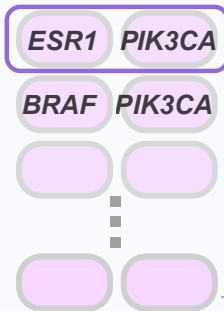# Identifying co-targeting candidates via network toplogies

Gene pairs harboring co-existing mutations (n = 1284)
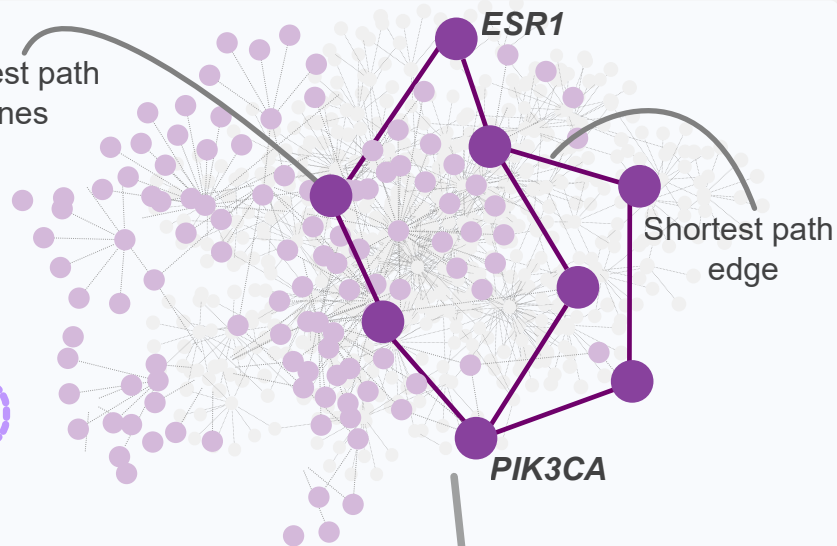
ESR1	*PIK3CA*
BRAF	*PIK3CA*
⋮	

Shortest paths between gene pairs (k=200)

PathLinker

HIPPIE PPI Network

Shortest path genes

ESR1

Shortest path edge

PIK3CA

Aggregate the genes on the shortest paths

ESR1

PIK3CA

Genes on the shortest paths
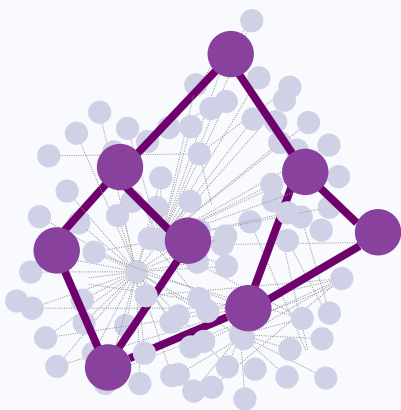
Signaling pathways
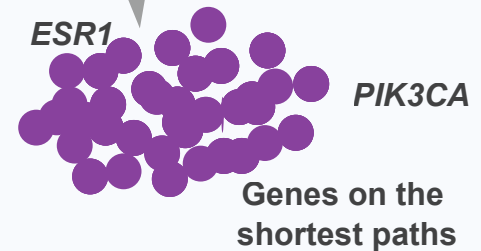
EnrichR

KEGG

Enrichment analysis

PI3K/AKT
Ras/MAPK
Wnt
Hippo
TGF-β
...

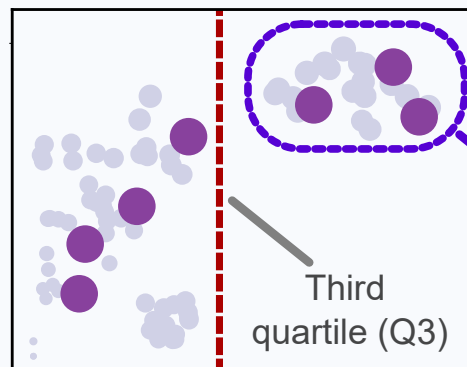**Pathways having >20% of the genes**

PageRank Algorithm

Gene-pair specific subnetwork

Subnetwork centrality scores

Selecting most important nodes as possible targets for combinations

Third quartile (Q3)

Betweennnes centrality

Co-targeting candidates