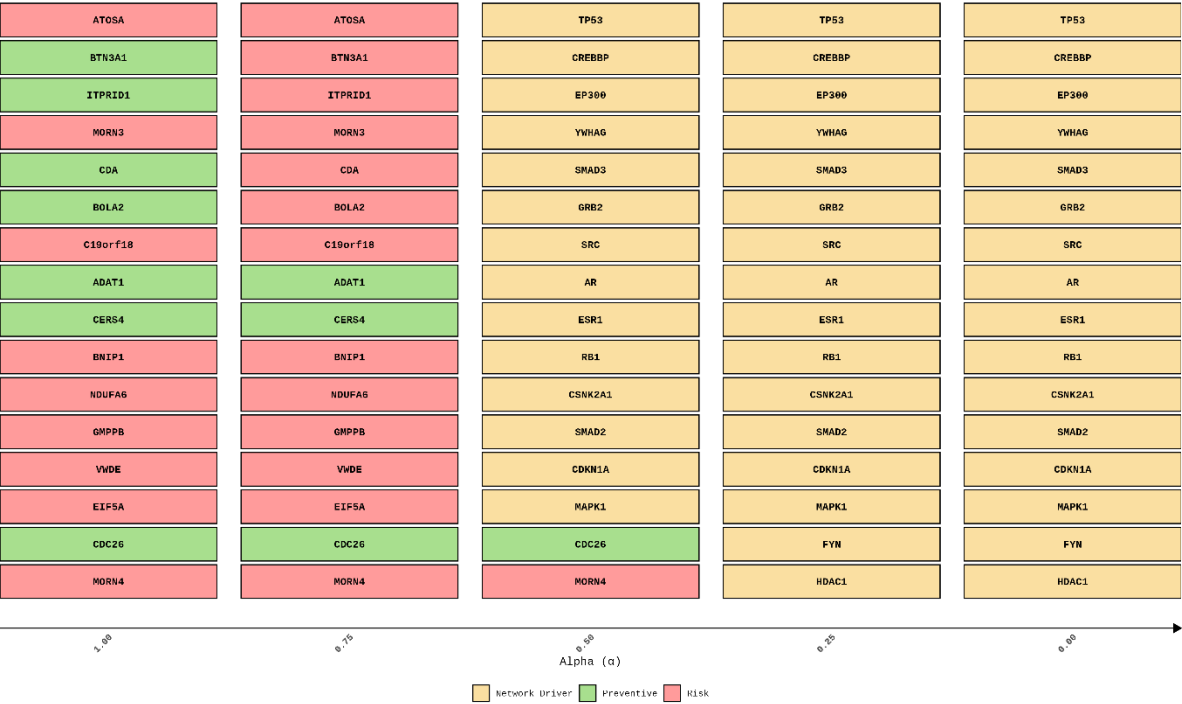
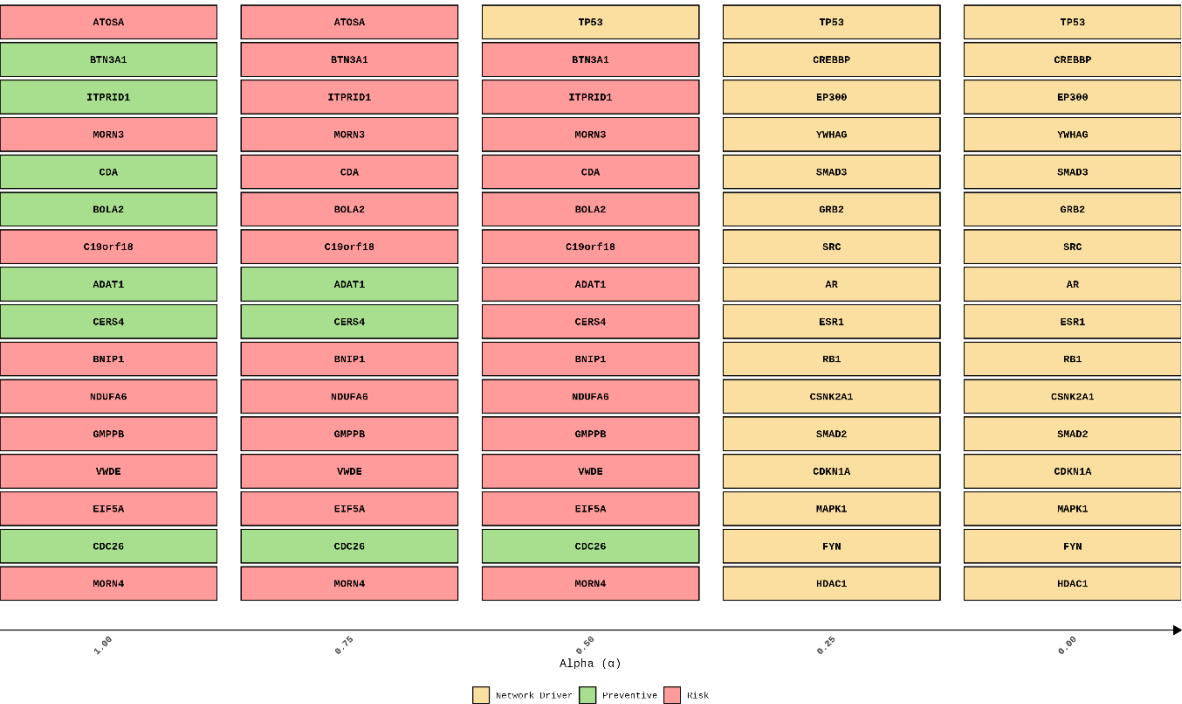


Different Normalization Techniques for the TOP 16 Genes:

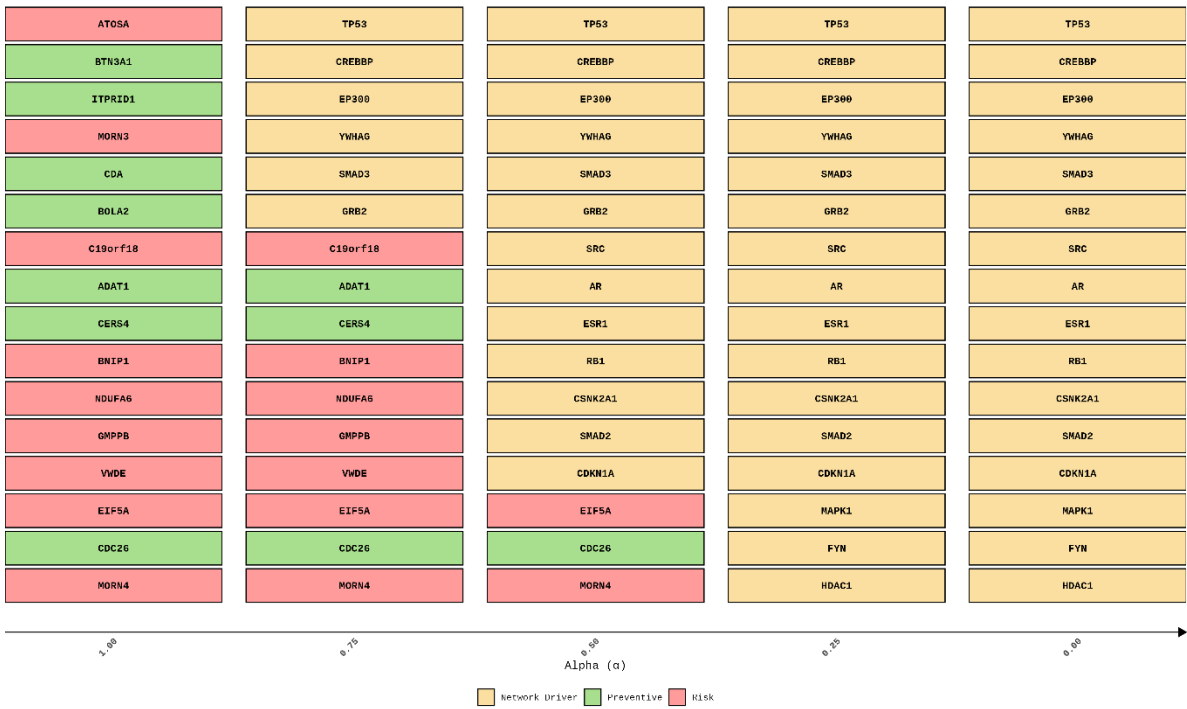
Top-16 genes across α – asinh



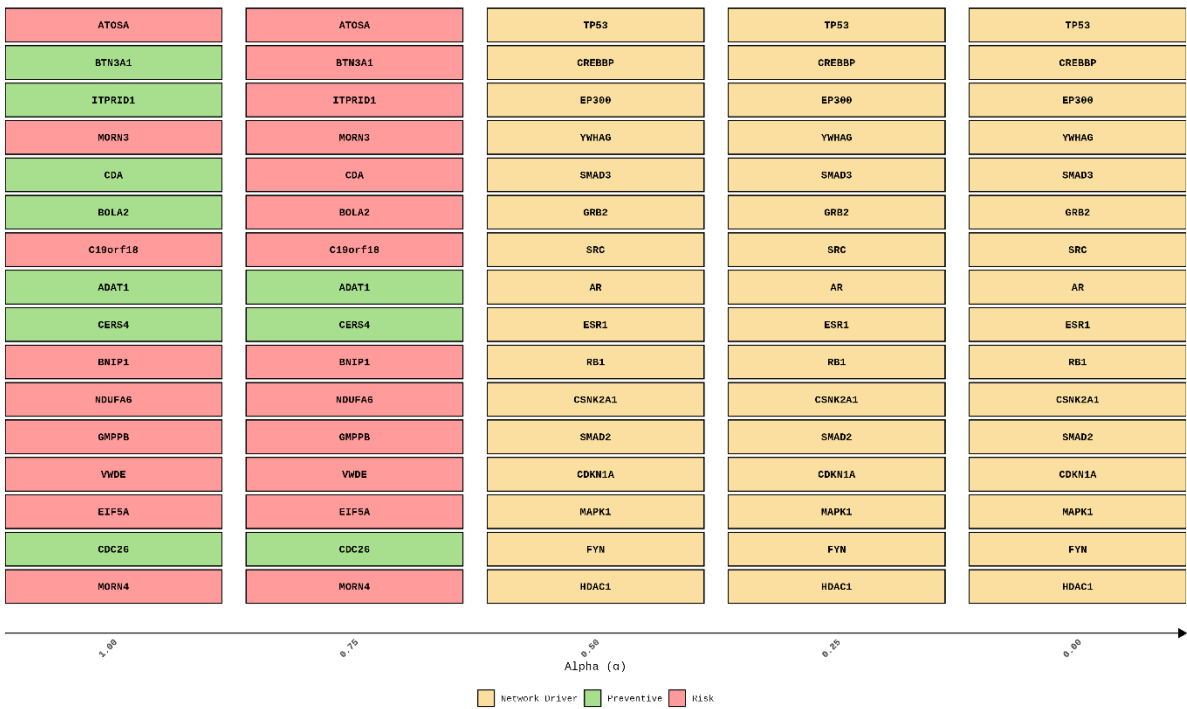
Top-16 genes across α – boxcox



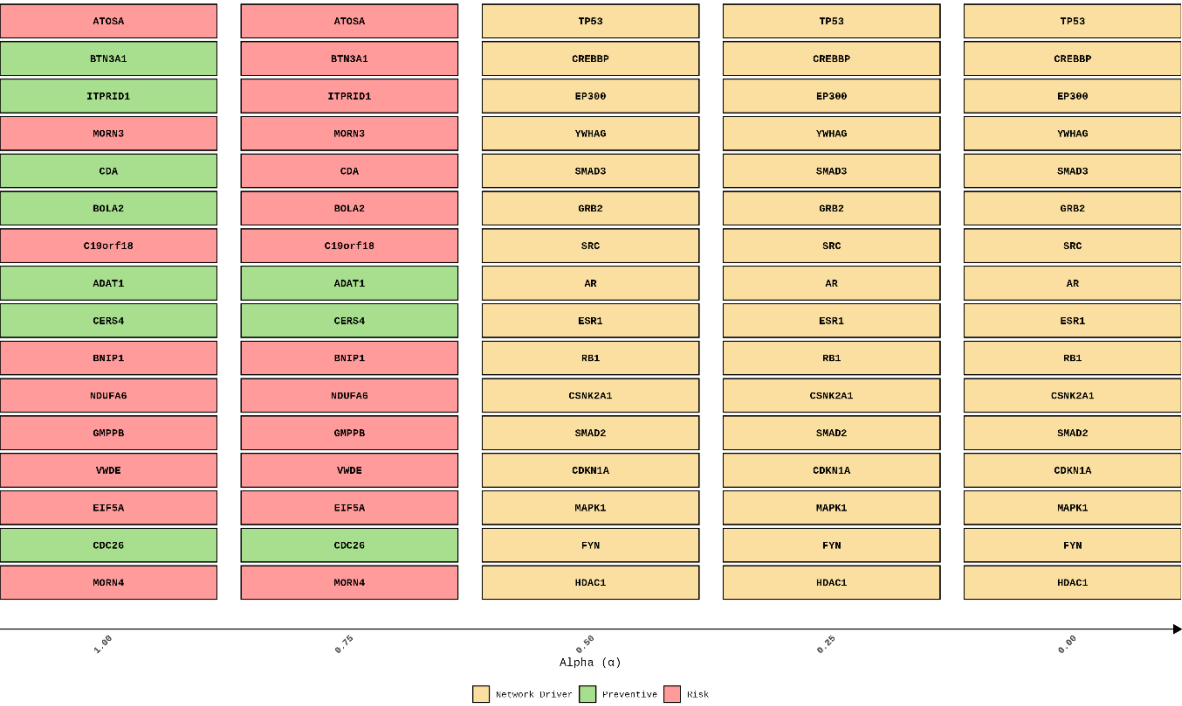
Top-16 genes across α – minmax



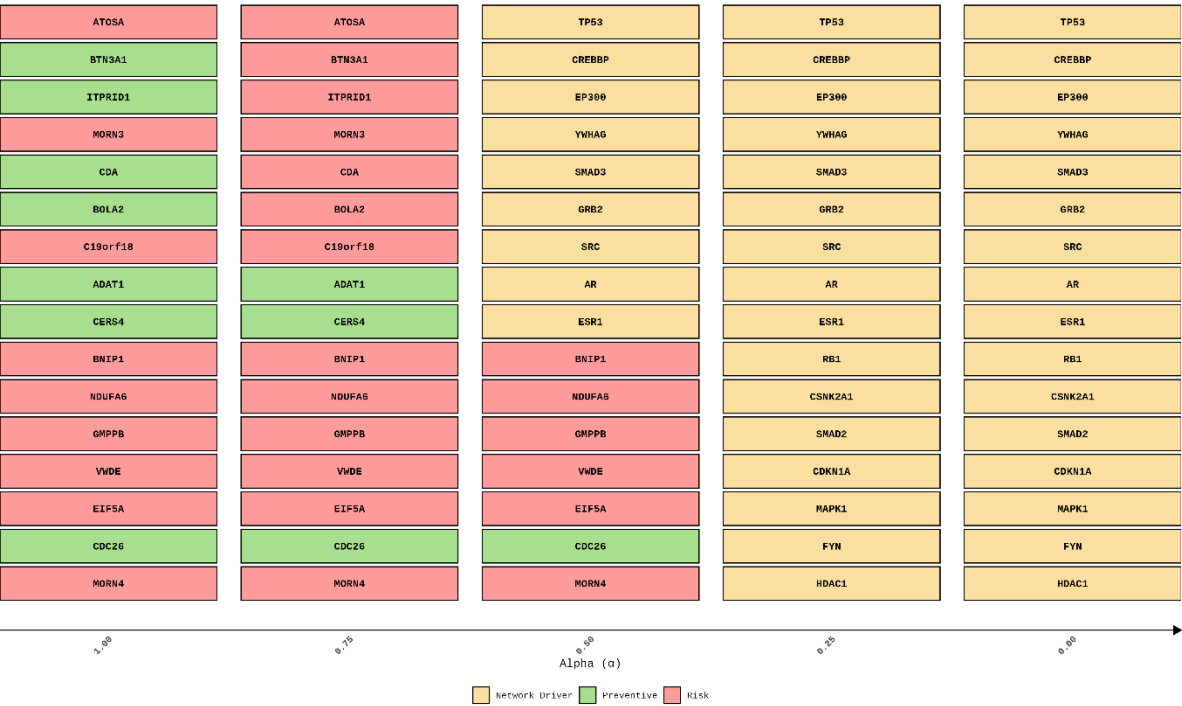
Top-16 genes across α – quantile



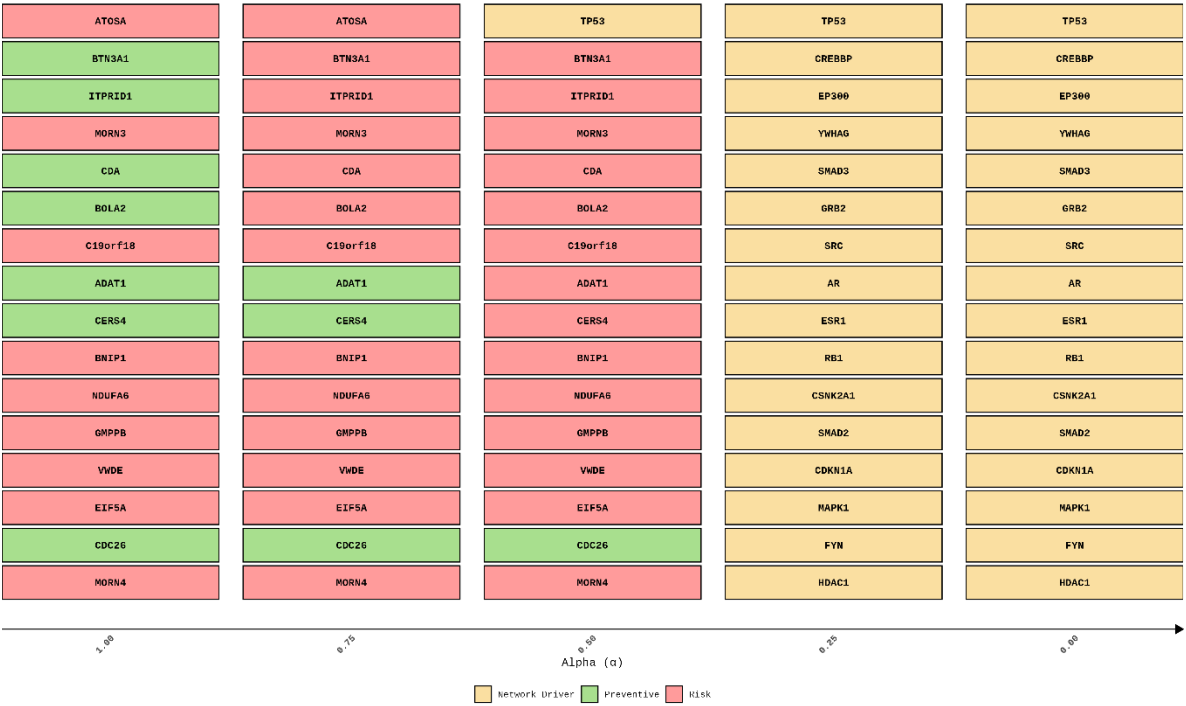
Top-16 genes across α – rank



Top-16 genes across α – r1n



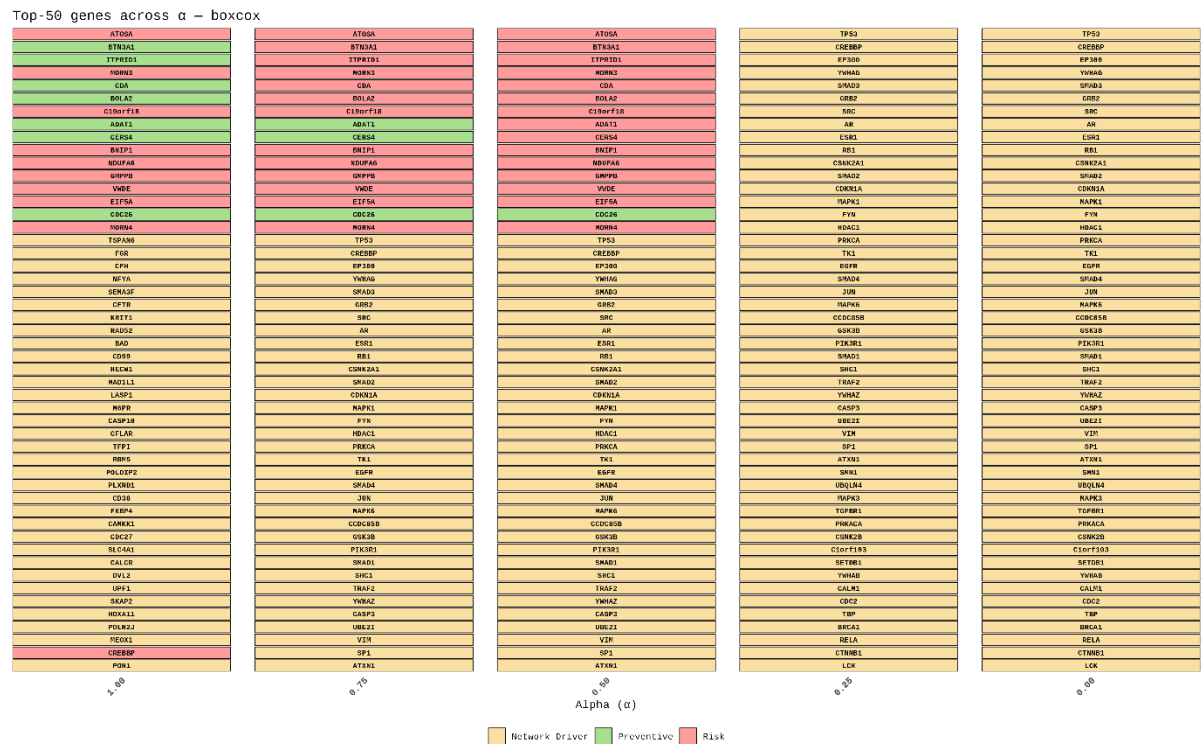
Top-16 genes across α – yeojohnson



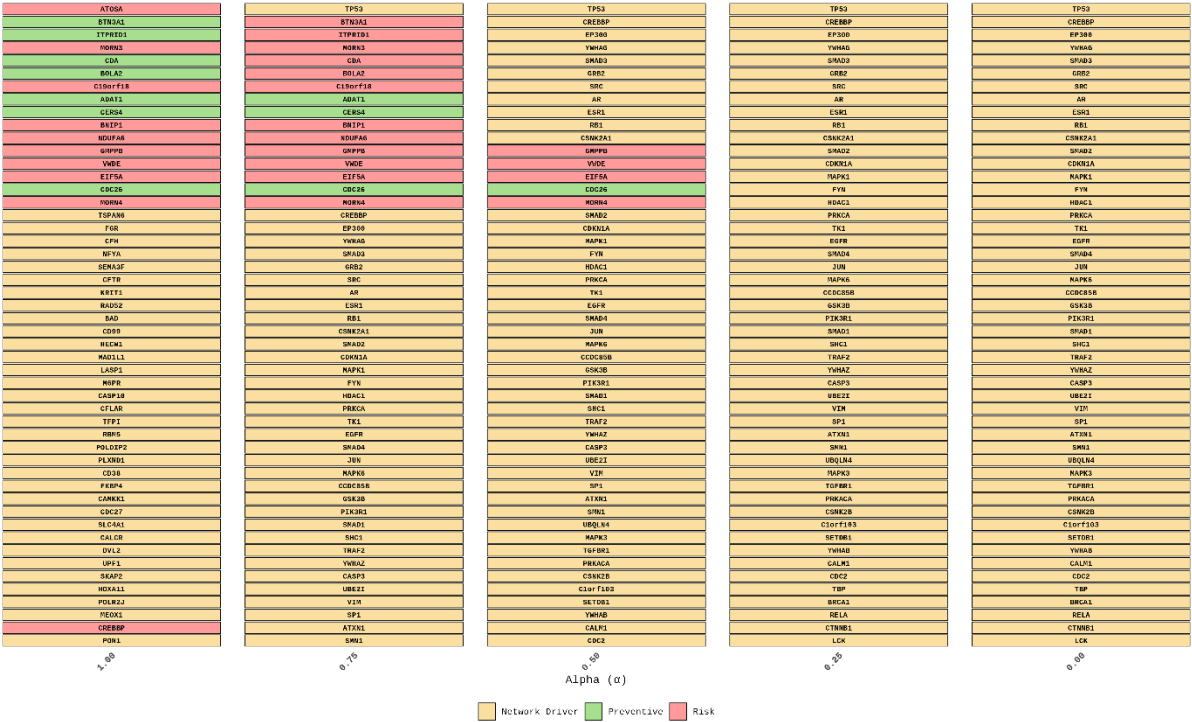
Top-50 genes across α – asinh

The figure displays three heatmaps side-by-side, each representing a different value of the parameter α : 0.00, 0.10, and 0.50. Each heatmap lists the top-50 genes across α using an asinh scale. The genes are color-coded based on their functional category: Network Driver (yellow), Preventive (green), and Risk (red). The heatmaps show how the ranking and functional composition of the top-50 genes change as α increases. For example, at $\alpha = 0.00$, the top genes are predominantly Network Drivers and Preventive genes, while at $\alpha = 0.50$, the top genes are predominantly Risk genes.

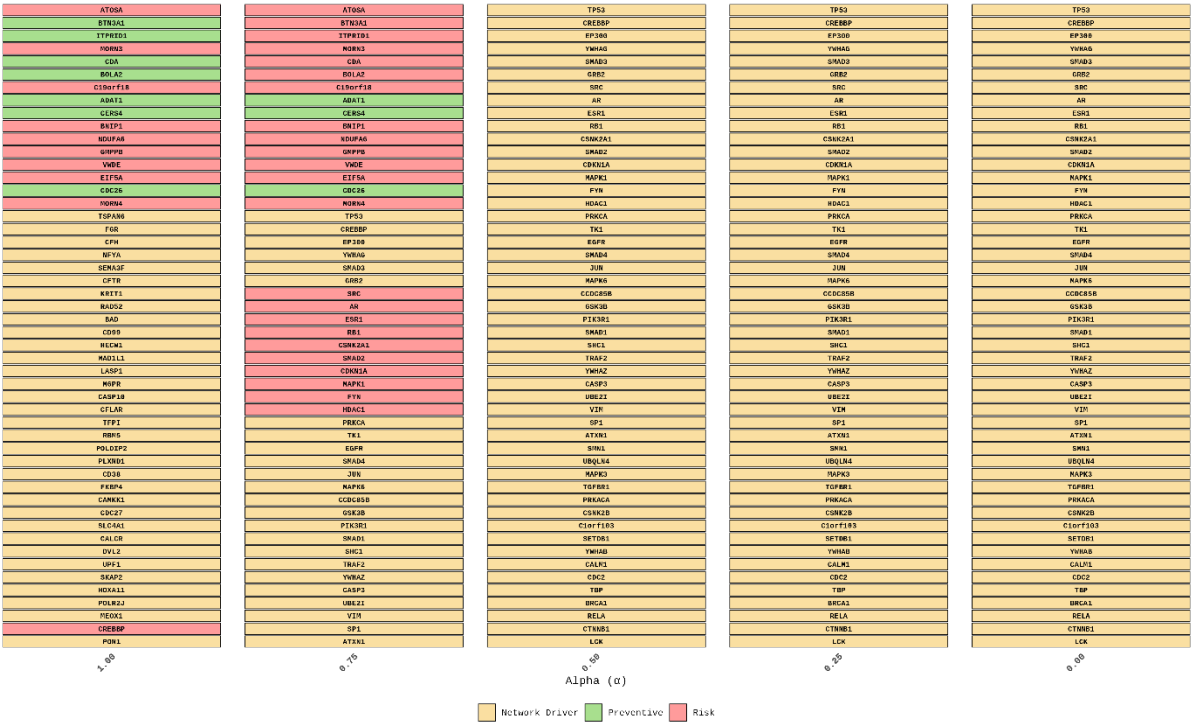
Gene	$\alpha = 0.00$	$\alpha = 0.10$	$\alpha = 0.50$
AT6GA	Preventive	Preventive	Preventive
STN3A1	Preventive	Preventive	Preventive
TPP82A1	Preventive	Preventive	Preventive
MOR83	Preventive	Preventive	Preventive
CDA	Preventive	Preventive	Preventive
BOLA2	Preventive	Preventive	Preventive
C10orf18	Preventive	Preventive	Preventive
ASAT1	Preventive	Preventive	Preventive
CE55A	Preventive	Preventive	Preventive
BRIP1	Preventive	Preventive	Preventive
KDUPA6	Preventive	Preventive	Preventive
GPPF9	Preventive	Preventive	Preventive
VWDE	Preventive	Preventive	Preventive
EITFA	Preventive	Preventive	Preventive
CDC26	Preventive	Preventive	Preventive
MOR84	Preventive	Preventive	Preventive
TP33	Preventive	Preventive	Preventive
FGR	Preventive	Preventive	Preventive
CFH	Preventive	Preventive	Preventive
MYT6	Preventive	Preventive	Preventive
SEK52	Preventive	Preventive	Preventive
CPT8	Preventive	Preventive	Preventive
KBT11	Preventive	Preventive	Preventive
RAD52	Preventive	Preventive	Preventive
SAD	Preventive	Preventive	Preventive
CD39	Preventive	Preventive	Preventive
REC61	Preventive	Preventive	Preventive
RAD311	Preventive	Preventive	Preventive
LASP1	Preventive	Preventive	Preventive
MSP8	Preventive	Preventive	Preventive
CASP18	Preventive	Preventive	Preventive
CTL3B	Preventive	Preventive	Preventive
TPP1	Preventive	Preventive	Preventive
RRB5	Preventive	Preventive	Preventive
POLDCP2	Preventive	Preventive	Preventive
FLXR01	Preventive	Preventive	Preventive
CC36	Preventive	Preventive	Preventive
FE694	Preventive	Preventive	Preventive
CANXK1	Preventive	Preventive	Preventive
CDC27	Preventive	Preventive	Preventive
SLC4A1	Preventive	Preventive	Preventive
CALCB	Preventive	Preventive	Preventive
UPL2	Preventive	Preventive	Preventive
UPS1	Preventive	Preventive	Preventive
SKAP2	Preventive	Preventive	Preventive
NOXA11	Preventive	Preventive	Preventive
POLR2J2	Preventive	Preventive	Preventive
FEOK1	Preventive	Preventive	Preventive
CRESBP	Preventive	Preventive	Preventive
PMK1	Preventive	Preventive	Preventive
TP53	Risk	Risk	Risk
CRESBP	Risk	Risk	Risk
EP308	Risk	Risk	Risk
YHAG	Risk	Risk	Risk
SMAD3	Risk	Risk	Risk
GRR2	Risk	Risk	Risk
SRC	Risk	Risk	Risk
AR	Risk	Risk	Risk
CSK1	Risk	Risk	Risk
RR1	Risk	Risk	Risk
CSNK2A1	Risk	Risk	Risk
SMAD2	Risk	Risk	Risk
CDKN1A	Risk	Risk	Risk
NATK1	Risk	Risk	Risk
PRK1	Risk	Risk	Risk
PRKCA	Risk	Risk	Risk
PRKCB	Risk	Risk	Risk
PRKCI	Risk	Risk	Risk
PRKCE	Risk	Risk	Risk
PRKCF	Risk	Risk	Risk
PRKCG	Risk	Risk	Risk
PRKCH	Risk	Risk	Risk
PRCK1	Risk	Risk	Risk
PRCK2	Risk	Risk	Risk
PRCK3	Risk	Risk	Risk
PRCK4	Risk	Risk	Risk
PRCK5	Risk	Risk	Risk
PRCK6	Risk	Risk	Risk
PRCK7	Risk	Risk	Risk
PRCK8	Risk	Risk	Risk
PRCK9	Risk	Risk	Risk
PRCK10	Risk	Risk	Risk
PRCK11	Risk	Risk	Risk
PRCK12	Risk	Risk	Risk
PRCK13	Risk	Risk	Risk
PRCK14	Risk	Risk	Risk
PRCK15	Risk	Risk	Risk
PRCK16	Risk	Risk	Risk
PRCK17	Risk	Risk	Risk
PRCK18	Risk	Risk	Risk
PRCK19	Risk	Risk	Risk
PRCK20	Risk	Risk	Risk
PRCK21	Risk	Risk	Risk
PRCK22	Risk	Risk	Risk
PRCK23	Risk	Risk	Risk
PRCK24	Risk	Risk	Risk
PRCK25	Risk	Risk	Risk
PRCK26	Risk	Risk	Risk
PRCK27	Risk	Risk	Risk
PRCK28	Risk	Risk	Risk
PRCK29	Risk	Risk	Risk
PRCK30	Risk	Risk	Risk
PRCK31	Risk	Risk	Risk
PRCK32	Risk	Risk	Risk
PRCK33	Risk	Risk	Risk
PRCK34	Risk	Risk	Risk
PRCK35	Risk	Risk	Risk
PRCK36	Risk	Risk	Risk
PRCK37	Risk	Risk	Risk
PRCK38	Risk		



Top-50 genes across α - minmax



Top-50 genes across α - quantile



top-50 genes across α - rank			
ATG5A	ATG5A	TP53	TP53
STN3A1	STN3A1	CREBBP	CREBBP
ITPBD3	ITPBD3	EP300	EP300
MDM3	MDM3	YWH46	YWH46
CDA	CDA	SMAD3	SMAD3
BCL2	BCL2	CRE2	CRE2
C13orf118	C13orf118	SRG	SRG
ABAT1	ABAT1	AR	AR
CERS4	CERS4	CSK1	CSK1
BNIP1	BNIP1	RS1	RS1
MDUP48	MDUP48	CSNK2A1	CSNK2A1
GPP36	GPP36	SMAD2	SMAD2
VDR	VDR	CKN1A	CKN1A
E1F5A	E1F5A	NAP1	NAP1
CDC38	CDC38	PTN	PTN
MDM4	MDM4	MDM3	MDM3
TOPAM8	TP53	PRKCA	PRKCA
FGR	CREBBP	TK1	TK1
CFM	EP300	EGFR	EGFR
MYT1	YWH46	SMAD2	SMAD2
SEN32F	SMAD3	JUN	JUN
CFTR	GRR2	NAPK6	NAPK6
KRT15	SRG	CCDC85B	CCDC85B
BAUD2	AR	OSK30	OSK30
SAD	CSK1	PTK1B1	PTK1B1
CD95	REL	SMAD1	SMAD1
WICK1	CSNK2A1	SHC1	SHC1
MAD1L1	SMAD2	TWAP2	TWAP2
LASP1	CSDN1A	YWH42	YWH42
NRP6	NAP1	LAP3	CASP3
CASP18	PTN	UBR21	UBR21
CTFAR	MDM3	VIZ1	VIZ1
TFP1	PRKCA	SP1	SP1
NRB5	TK1	ATXN1	ATXN1
POLR2P	EGFR	SHN1	SHN1
PLXN81	SMAD4	USQ1N4	USQ1N4
CD38	JUN	NAPK3	NAPK3
PRK4	NAPK6	TGFB1	TGFB1
CANX1	CCDC85B	PRKACA	PRKACA
CCQ27	GRR2	CKN1B	CKN1B
SLC441	PTK1B1	C1orf1183	C1orf1183
CALCR	SMAD1	SFTD1	SFTD1
DVL2	SHC1	YWH48	YWH48
UPP1	TWAP2	CALP1	CALP1
SLAP1	YWH42	CCQ2	CCQ2
MDX11	CASP3	TSP	TSP
POLR2J2	UBR21	BRCA1	BRCA1
MEK1	VIZ1	RELA	RELA
CREBBP	SP1	CTNBB1	CTNBB1
PDL1	ATXN1	LCK	LCK

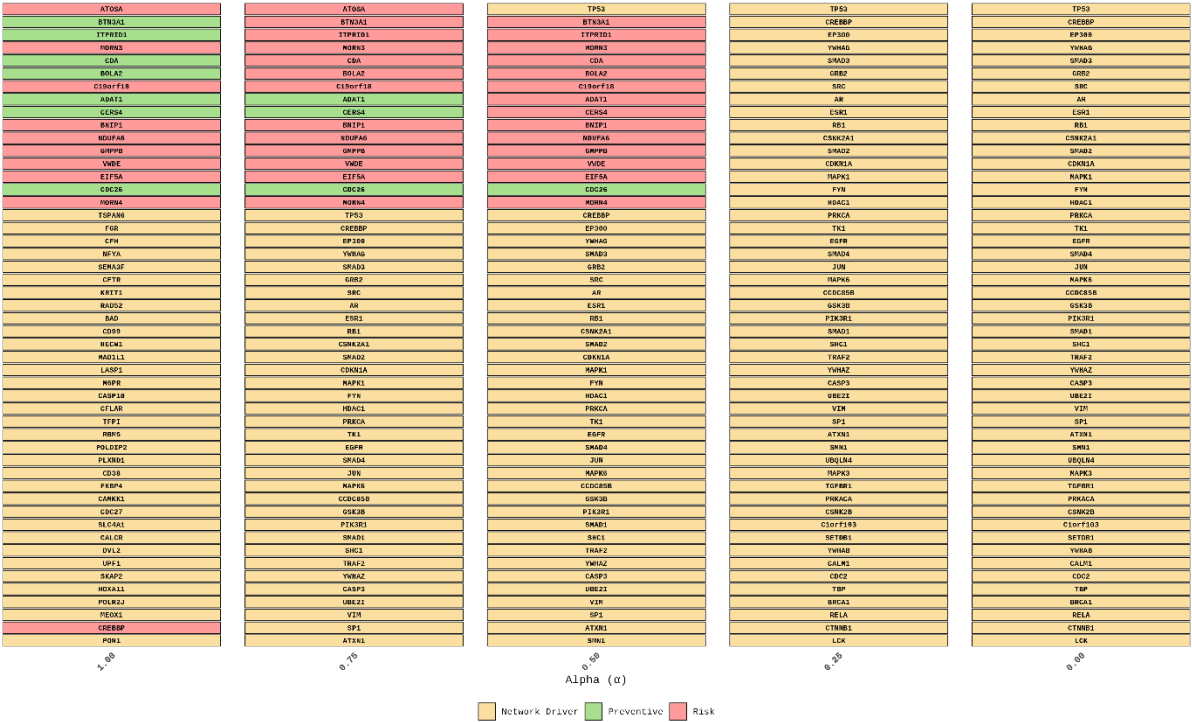
1.00
0.75
0.50
0.25
0.00

α

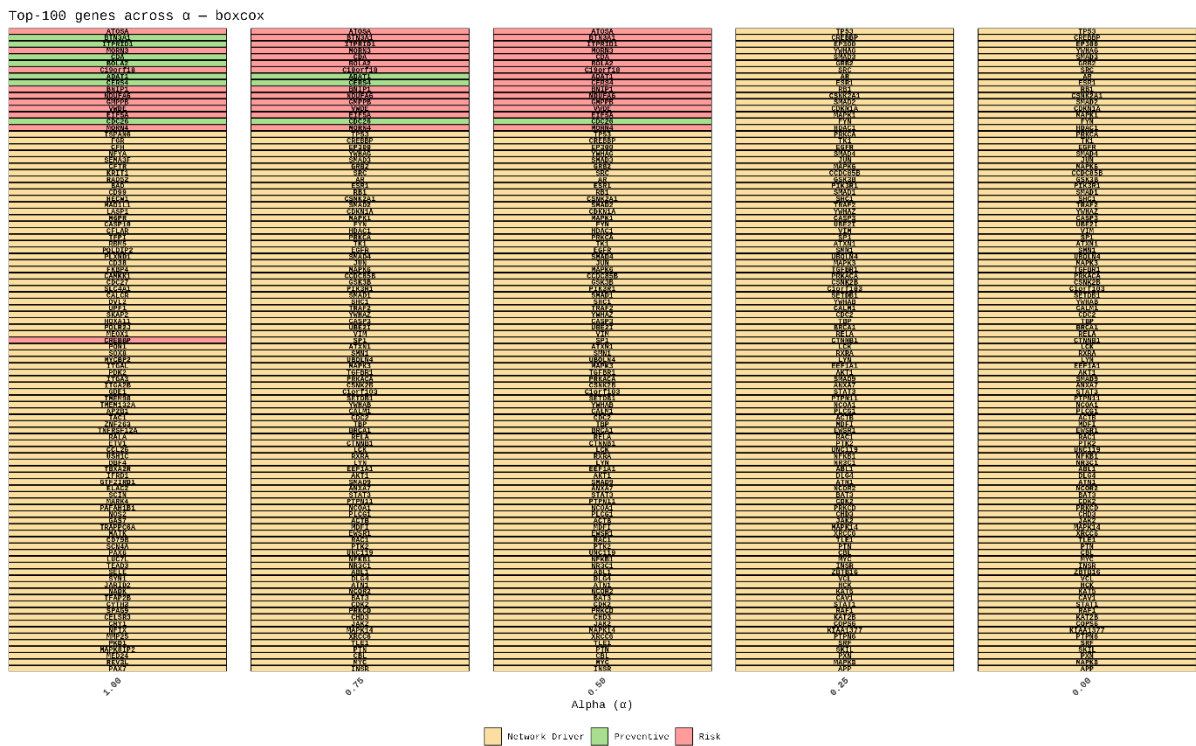
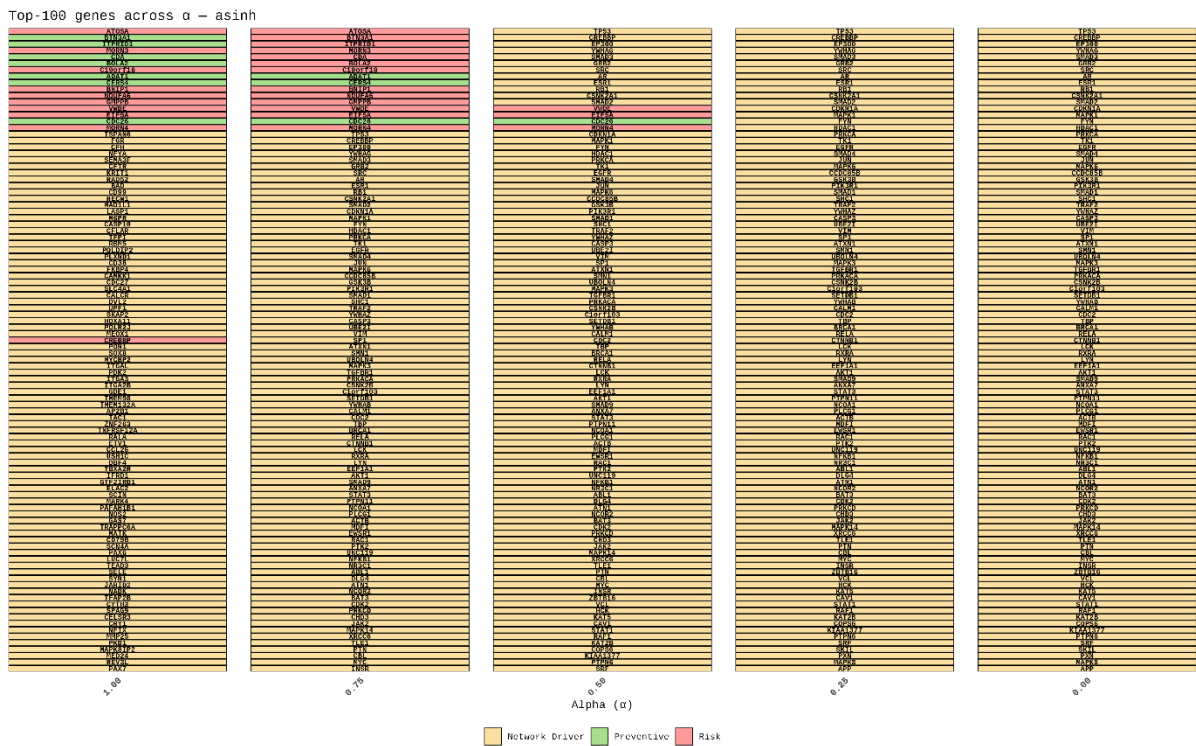
Network Driver
Preventive
Risk

[illegible]

Top-50 genes across α - yeojohnson



Different Normalization Techniques for the TOP 100 Genes:



[illegible]

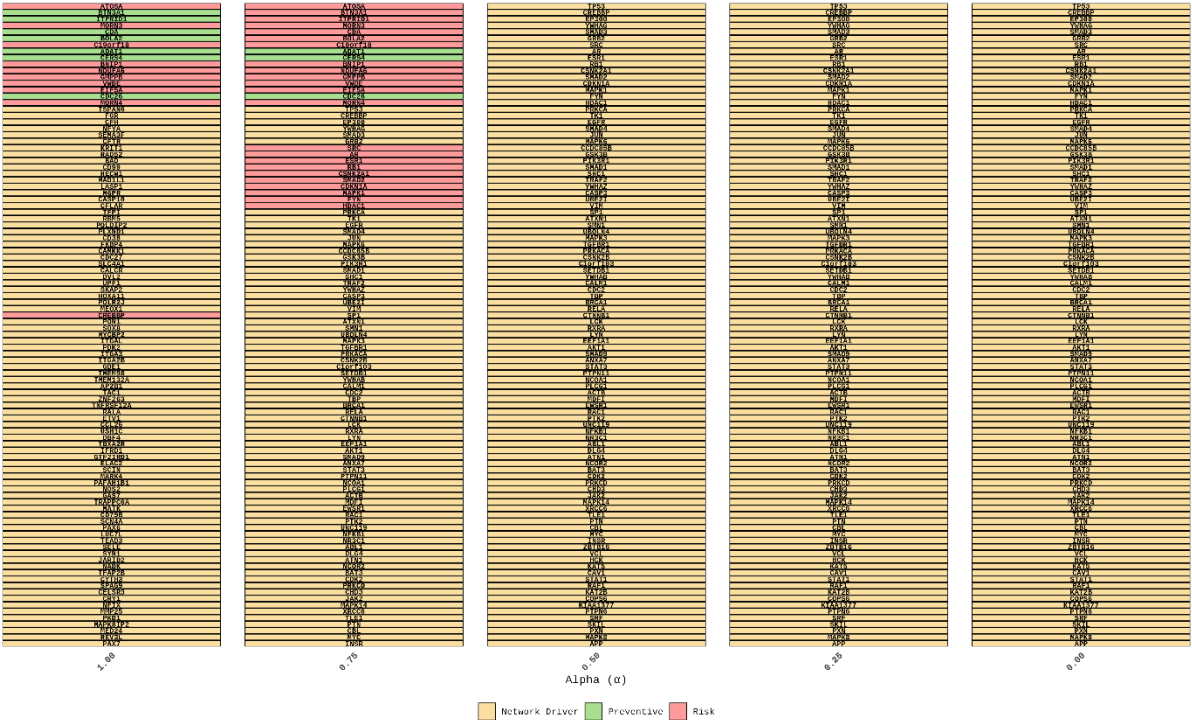
Figure 1 displays four stacked bar charts showing the distribution of risk factors (Network Driver, Preventive, Risk) across different Alpha (α) values (1.00, 0.75, 0.50, 0.25, 0.00). The y-axis represents the count of risk factors, ranging from 0 to 1000. The x-axis represents Alpha (α).

The legend indicates:

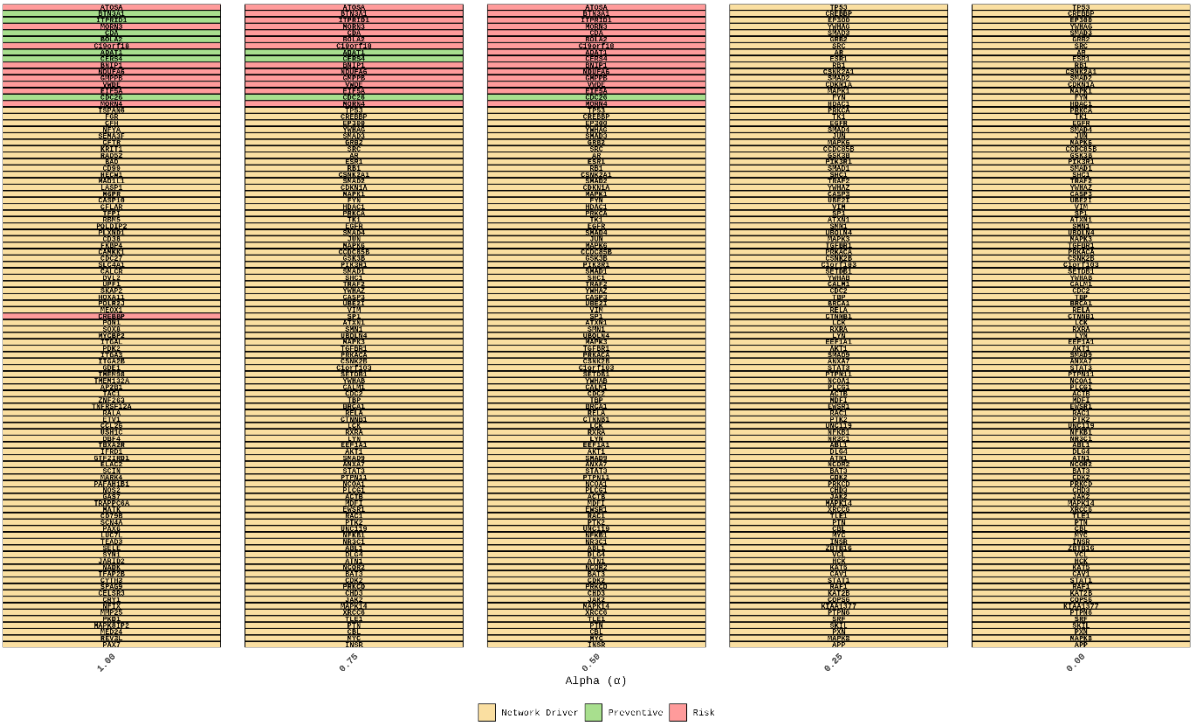
- Network Driver (Yellow)
- Preventive (Green)
- Risk (Red)

The charts show that as Alpha (α) decreases, the proportion of Network Driver risk factors increases significantly, while the proportion of Preventive and Risk factors decreases. At Alpha (α) = 1.00, the distribution is roughly equal across the three categories. At Alpha (α) = 0.00, the distribution is almost entirely composed of Network Driver risk factors.

Top-100 genes across α - rank



Top-100 genes across α - rin



Top-100 genes across α - yeojohnson

