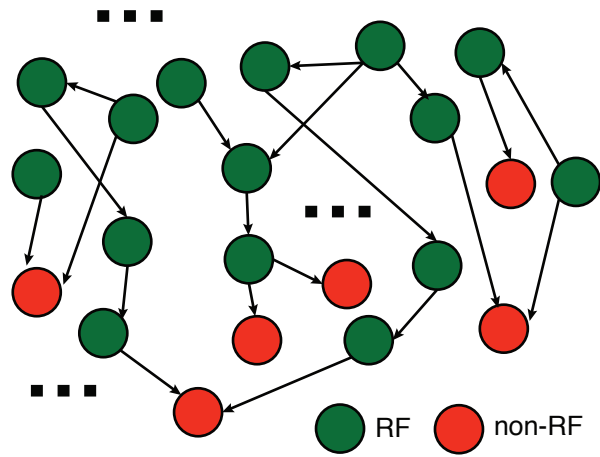


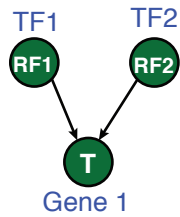
# 1. Input gene regulatory network

Regulatory Factor (RF)	Target (T)
TF 1	Gene 1
TF 2	Gene 1
TF 3	Gene 2
miRNA 1	Gene 1
miRNA 2	Gene 3
miRNA 3	Gene 2
...	...



# 2. Select RF1-RF2-T triplet

RF1	RF2	Common Target (T)
TF 1	miRNA 1	Gene 1
TF 1	TF 2	Gene 1
TF 3	TF 1	Gene 2
...	...	...



# 3. Query binarized expression data

	Sample 1	Sample 2	...
Gene 1	1	0	...
Gene 2	0	0	...
...	...	...	...
TF 1	0	1	...
TF 2	1	1	...
...	...	...	...

# 4. Extract triplet gene expression data

	Sample 1	Sample 2	...
TF 1	1	0	...
TF 2	1	1	...
Gene 1	1	0	...

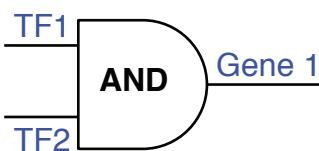
# 5\*. Match to all possible logic gates

In	RF1
	RF2

Out (T)	0
	RF1*RF2 (AND)
	RF1*~RF2
	----
	~(RF1*RF2) (NAND)
	1

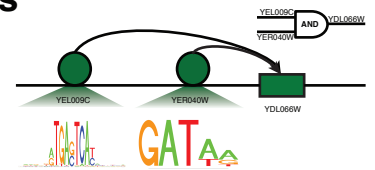
# 6\*. Select most consistent logic gate(s)



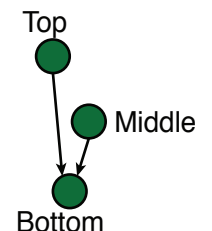
Gene 1 = TF1*TF2				
RF1= TF1	0	0	1	1
RF2= TF2	0	1	0	1
T=Gene1	0	0	0	1

# 7. Applications

\* Promoter motifs



\* Regulatory hierachical layers



\* See Figure 2 for details