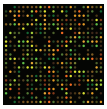
A

abiotic stress
microarray compendium

PlantTFDB +



LeMoNe
Learning Module Networks

Joshi et al., 2009

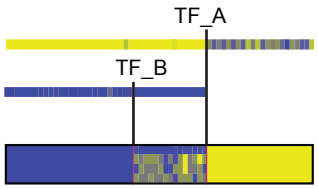
1. ensemble clustering of genes into modules

* Gibbs sampler clusters genes and conditions
* graph spectral method extracts tight clusters

25% tight | 50% tight

2. ensemble prioritization of TFs per module

* fuzzy decision tree assigns TFs to condition clusters in module
* ensemble score ≥ 10



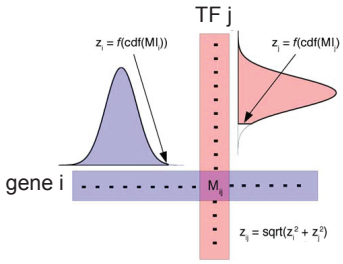
3. mean reciprocal rank aggregation of predicted TFs in 2 solutions

LeMoNe_qopt25R | LeMoNe_qopt50R

CLR
Context-Likelihood Relatedness

Faith et al., 2007

* mutual information of TF and target gene
* z-score ≥ 3.5



ClrR

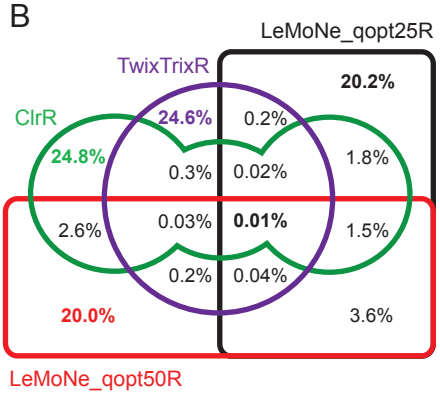
TwixTrix

Qi and Michoel, 2012

* differential expression of all TFs in critical contrast of target gene i.e. separation of samples into 2 sets with the most differential expression of target gene
* z-score ≥ 3

TwixTrixR

B



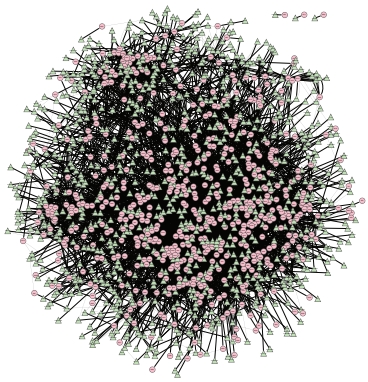
C

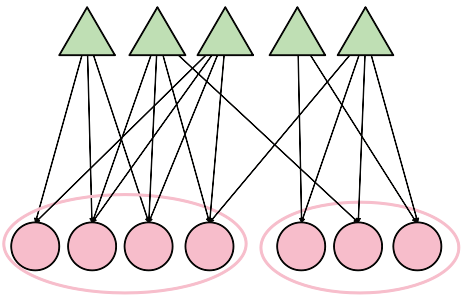
TF	gene	Qopt25R-rank	Qopt50R-rank	ClrR-rank	TwixTrixR-rank	Union	Union-rank	Rank_rp	Rank_rp-rank	Rank_av	Rank_av-rank
A	B	1	3	4	1	1	1	0.65	1	2.25	2
C	D	2	2	3	3	2	2	0.42	4	2.5	3
A	E	3	1	2	2	1	1	0.58	2	2	1
B	C	4	4	1	5	1	1	0.43	3	3.5	4
B	F	5	5	5	4	4	3	0.21	5	4.75	5

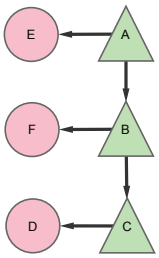
top 200,014 interactions

D

abiotic stress module GRN





abiotic stress modules of coregulated genes

abiotic stress GRN