SUPPLEMENTARY MATERIAL

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T-ReCS: a stable group feature selection method for analysis of omics data and clinical outcomes

Suppl Figure S1. Pseudo-code of the T-RECS algorithm.

Suppl Figure S2. The network structure used in the generation of the synthetic data. The target variable (red) has three parents, three children, 25 connected ancestors and 25 connected descendants Nodes 57 – 100 are unconnected variables.

Suppl Figure S3. The tree structure and clustered variable selection on the LGRC dataset.

Suppl Figure S4. T-ReCS results on the LGRC dataset. Network of interactions between the 40 T-ReCS selected miRNAs (blue triangles) and their putative mRNA targets (yellow circles).

MMPConReKS($D; T; k; a, a_{Dep(X';T|S)}, a_{Ind(X;T|X')}$)

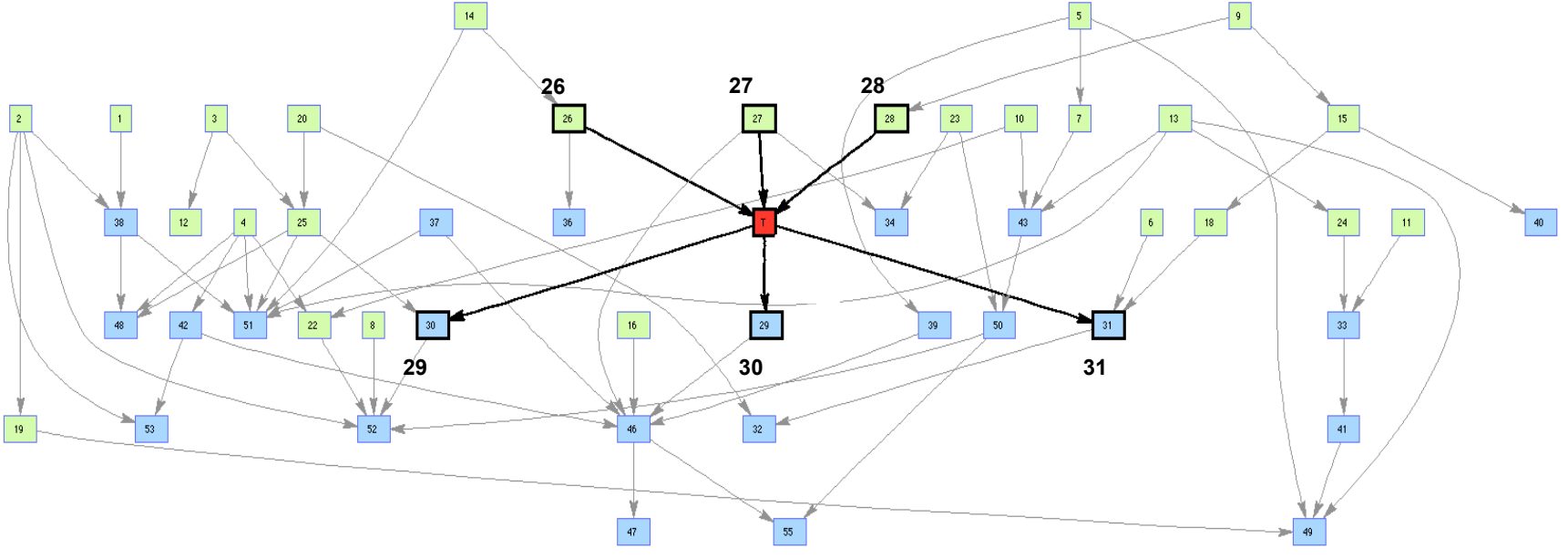
// **Input: Data** D with all variables ϕ; Target T; maximum conditioning set size k; threshold for single variable test a_{single}, thresholds for group variable tests $a_{Dep(X';T|S)}$, $a_{Ind(X;T|X')}$
// **Output:** set of single or group variables G

1 P = ReKS(D) // call ReKS to obtain P, a tree partition of the variables ϕ
2 PC = MMPC ($D; T; k;\ a_{single}$) // obtain predictive single variables PC

3 **for** every variable X in PC
4 $X' = X$ // initialize both current and parent node to the starting leaf node
5 **while** true
6 X^c=X' // set current node to the former parent node
7 X'= $ParentNode_P(X')$ // define new parent node

// first group variable conditional independence test
6 **for** all $S \subseteq PC\backslash\{x\}, s.t.\ |s| \leq k$
7 **if** $Ind(X'; T|S)$, or $P(X'; T|S) > a_{Dep(X';T|S)}$
8 **break** // do not replace X with this group variable
9 **end if**
10 **end for**

// second group variable conditional independence test
11 **if** $Dep(X; T|X')$, or $P(X; T|X') < a_{Ind(X;T|X')}$
12 **break** // do not replace X with this group variable
13 **end if**
14 **end while**
15 $G = G \cup X^c$
16 **end for**
17 **return G**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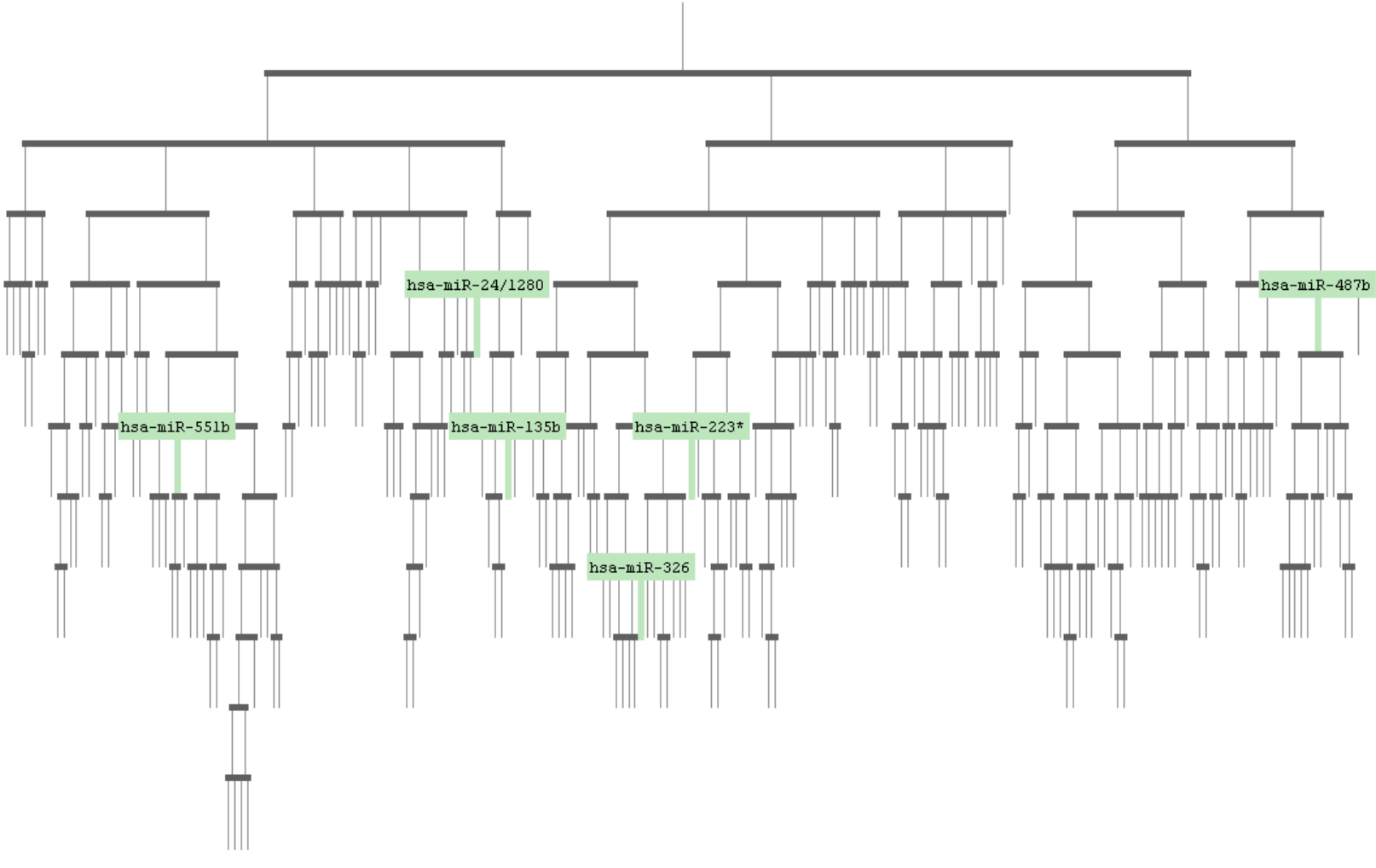
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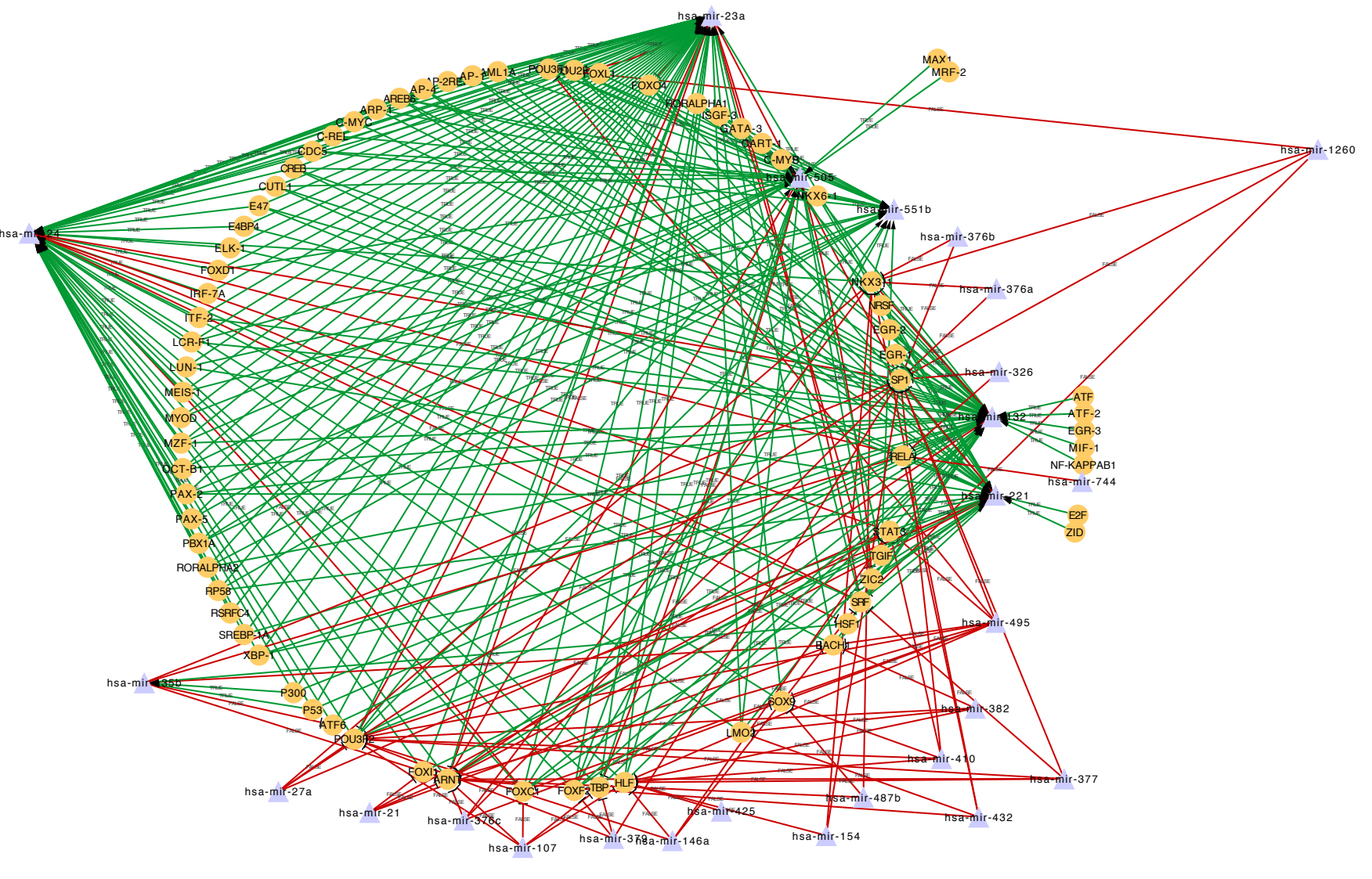
hsa-miR-55lb
hsa-miR-135b
hsa-miR-223*
hsa-miR-326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MRF-2
hsa-mir-1260
AP-2REP
AP-2
ML1A
POU3F2
FOXL1
FOXO4
RORALPHA1
SGF-3
GATA-3
ART-1
C-MYB
hsa-mir-505
NKX6-1
hsa-mir-551b
hsa-mir-376b
hsa-mir-376a
NKX3-1
NRSF
EGR-2
EGR-1
SP1
hsa-mir-326
hsa-mir-132
ATF
ATF-2
EGR-3
MIF-1
NF-KAPPAB1
hsa-mir-744
RELA
hsa-mir-221
E2F
ZID
STAT3
ITGIF
ZIC2
SRF
HSF1
BACH1
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FOX3
hsa-mir-382
LMO2
hsa-mir-410
hsa-mir-377
hsa-mir-487b
hsa-mir-432
hsa-mir-154
hsa-mir-425
hsa-mir-146a
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hsa-mir-107
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FOXI1
ARNT
FOXC2
FOXF2
TBP
HLF
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P300
P53
ATF6
POU3F2
XBP-1
SREBP-1A
RSRFC4
RP58
RORALPHA2
PBX1A
PAX-5
PAX-2
OCT-B1
MZF-1
MYOD
MEIS-1
LUN-1
LCR-F1
ITF-2
IRF-7A
FOXD1
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