Summary reports of non-classic function detection of : test5

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Contents

1 Data description

Table 1 mainly describes the input files, parameters and options.

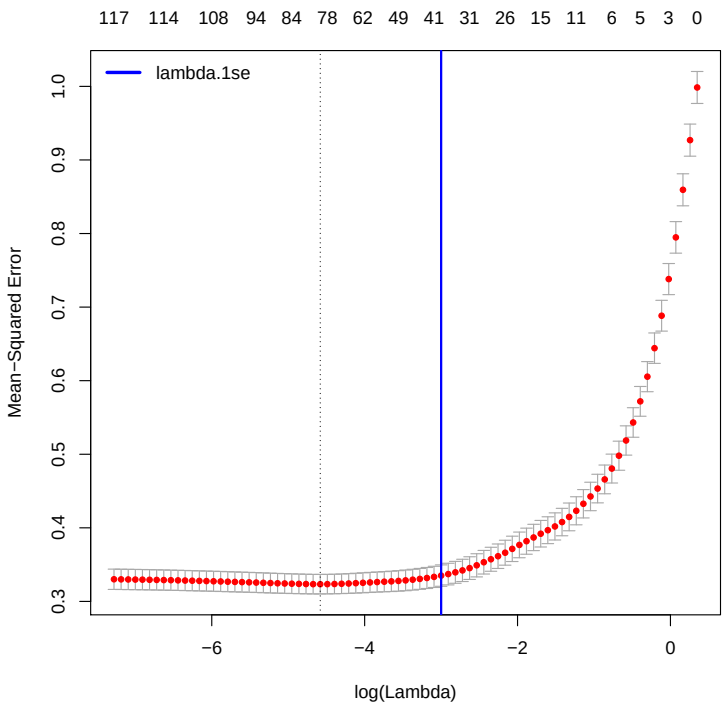
Table 1: parameter description

parameter	value
output name	test5
HMRpeak(peak filename)	mESC_GSM1562337_CBX7.bed
HM signal(bw filename)	mESC_GSM1399500_H3K27me3.bw
#coTF candidates	143
options	value
extend size	1000bp
Alpha (Elastic net)	0.5
Pvalue cutoff	0.001
topN cofactors	all

2 ElasticNet co-factor selection

In this step we use a feature selection (elastic-net. Zou, H. and Hastie T. (2005) to select potential co-factors which corresponded to the non-classic function. Below shows the cross-validation curve for the decison of lambda in elastic-net.

Figure 1: cross-validation curve for lambda decision



3 potential co-factors corresponded to non-classic function

In summary, 9 factors were predicted to potentially act as a co-factor of the non-classic function. The top9 co-factors were listed.

3.1 summary of co-factors

The empirical p-value, R-square (ordered) and the number of non-classic (NC) sites for each potential co-factors were listed below. The empirical p-value was calculated based on the comparison of foreground (observed) R-square and background R-square (distribution of random R-square generated from the 1,000 permutations of co-binding events) for each potential co-factor. The non-classic sites were defined by lower HM signal (using Otus' method) and co-binding events of each potential co-factor.

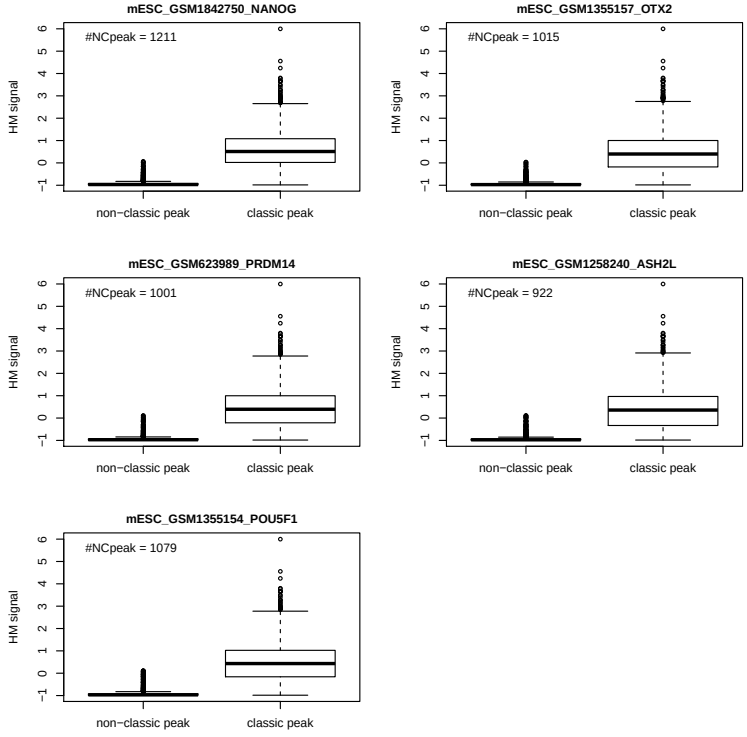
Table 2: cofactor summary

co-factor	p-value	R-square	#NCsites
mESC_GSM1842750_NANOG	0.001	0.503	1211
mESC_GSM1355157_OTX2	0.001	0.372	1015
mESC_GSM623989_PRDM14	0.001	0.357	1001
mESC_GSM1258240_ASH2L	0.001	0.301	922
mESC_GSM1355154_POU5F1	0.001	0.235	1079
mESC_GSM1208218_KLF5	0.001	0.169	761
mESC_GSM1406445_TRIM28	0.001	0.124	568
mESC_GSM1003807_ZNF384	0.001	0.106	483
mESC_GSM935891_ELL3	0.001	0.105	459

3.2 Boxplot of HM on non-classic and classic sites

Boxplot was generated to compare the difference of the histone mark (HM) signal on either non-classic(NCpeak) or classic sites. The non-classic sites were defined by lower HM signal (using Otus' method) and co-binding events of each potential co-factor. The boxplot corresponded to top5 co-factors were displayed.

Figure 2: boxplot cofactor HMsignal



4 Output list

All output files were described in the following table

Table 3: output list

description	filename
cobinding matrix on HMR peaks	tmpResults/test5_peakov.bed
histone mark signal on HMR peaks	tmpResults/test5_HMsig.bed
summary table of non-classic function	summary/test5_NCsummary.txt
summary report (this doc)	summary/test5_summary.pdf