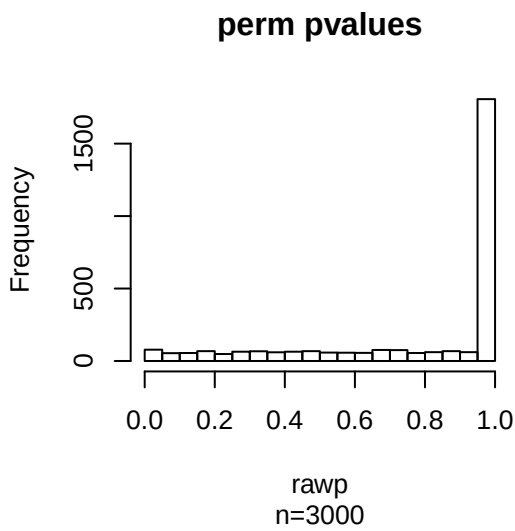
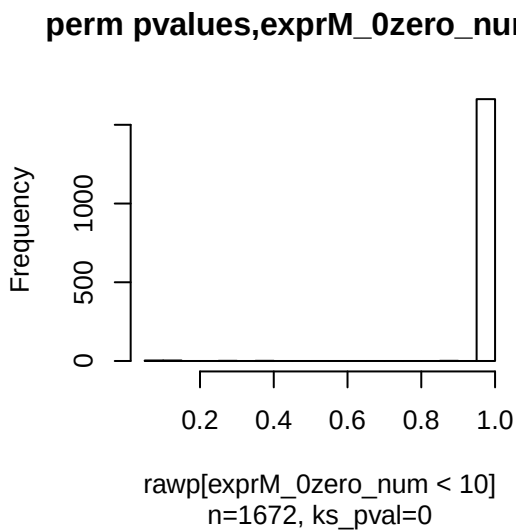
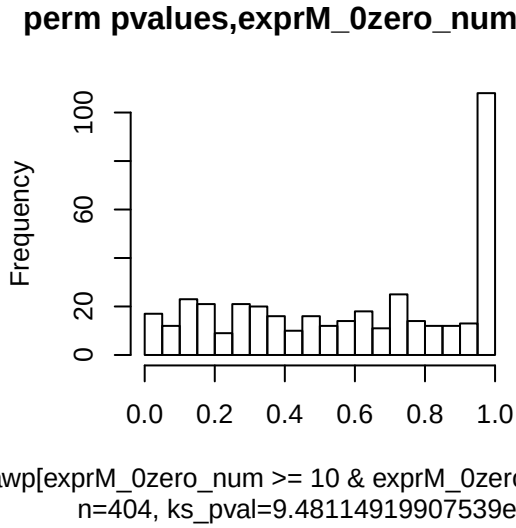
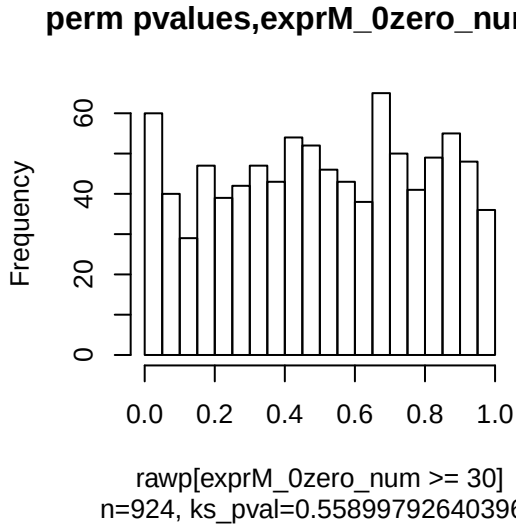
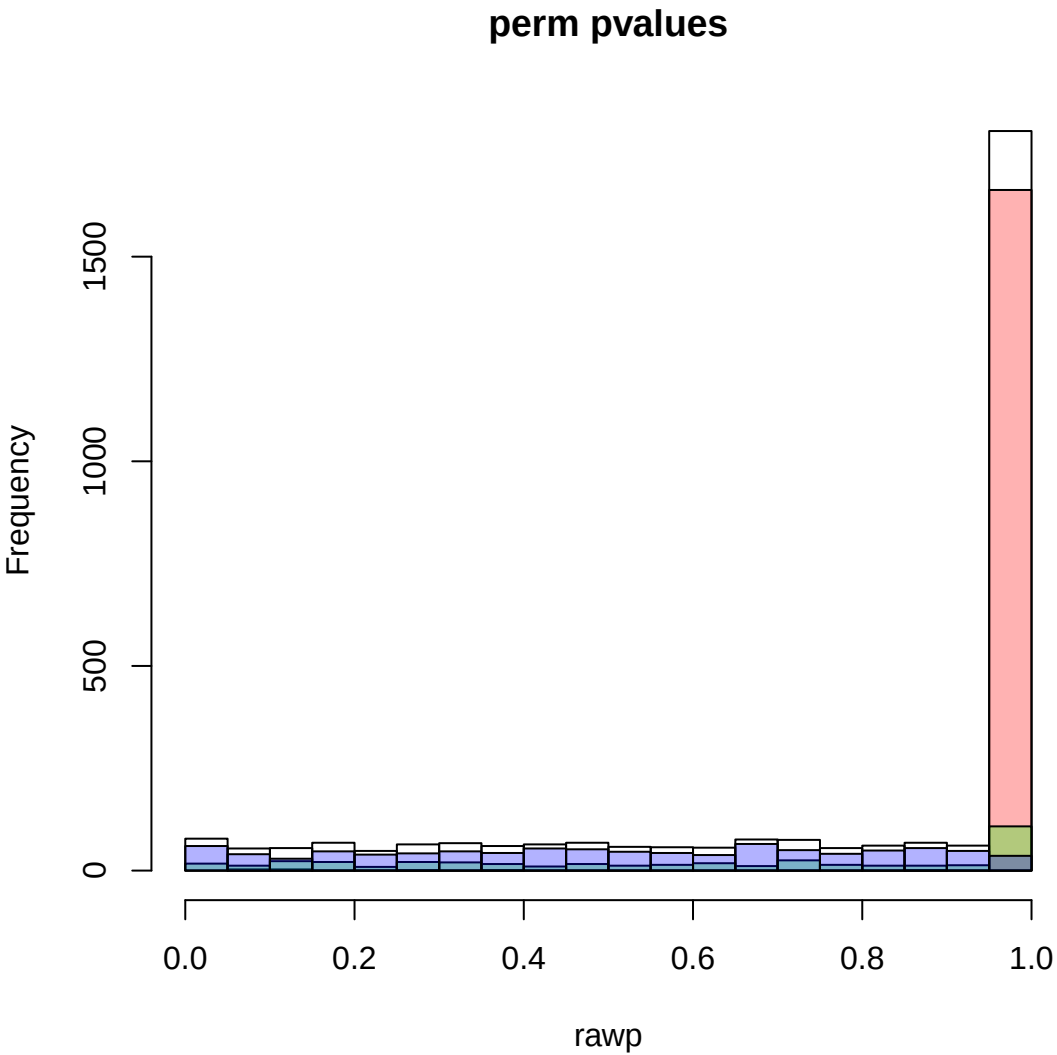
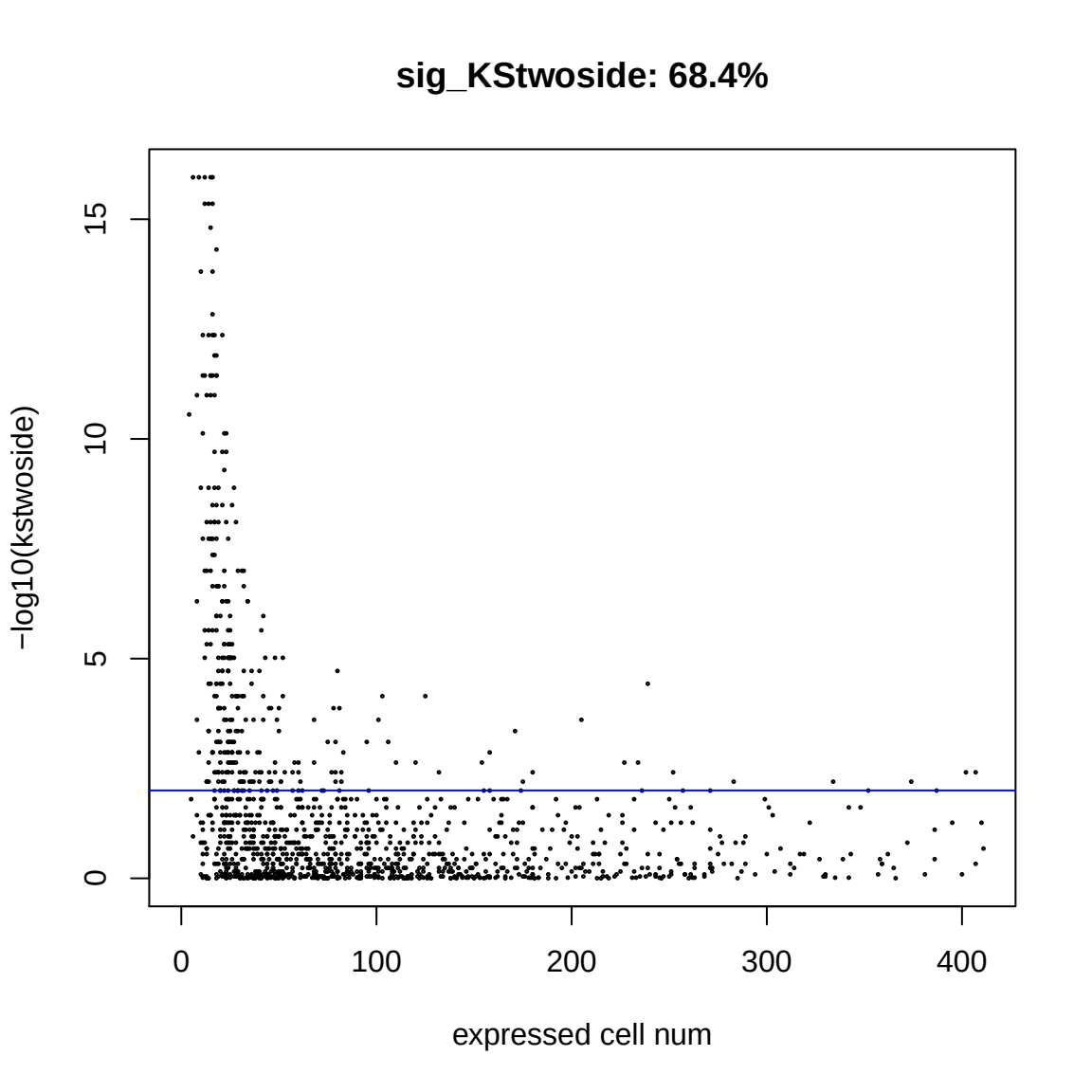

perm pvalues
Frequency
0
500
1500
0.0
0.2
0.4
0.6
0.8
1.0
rawp
n=3000

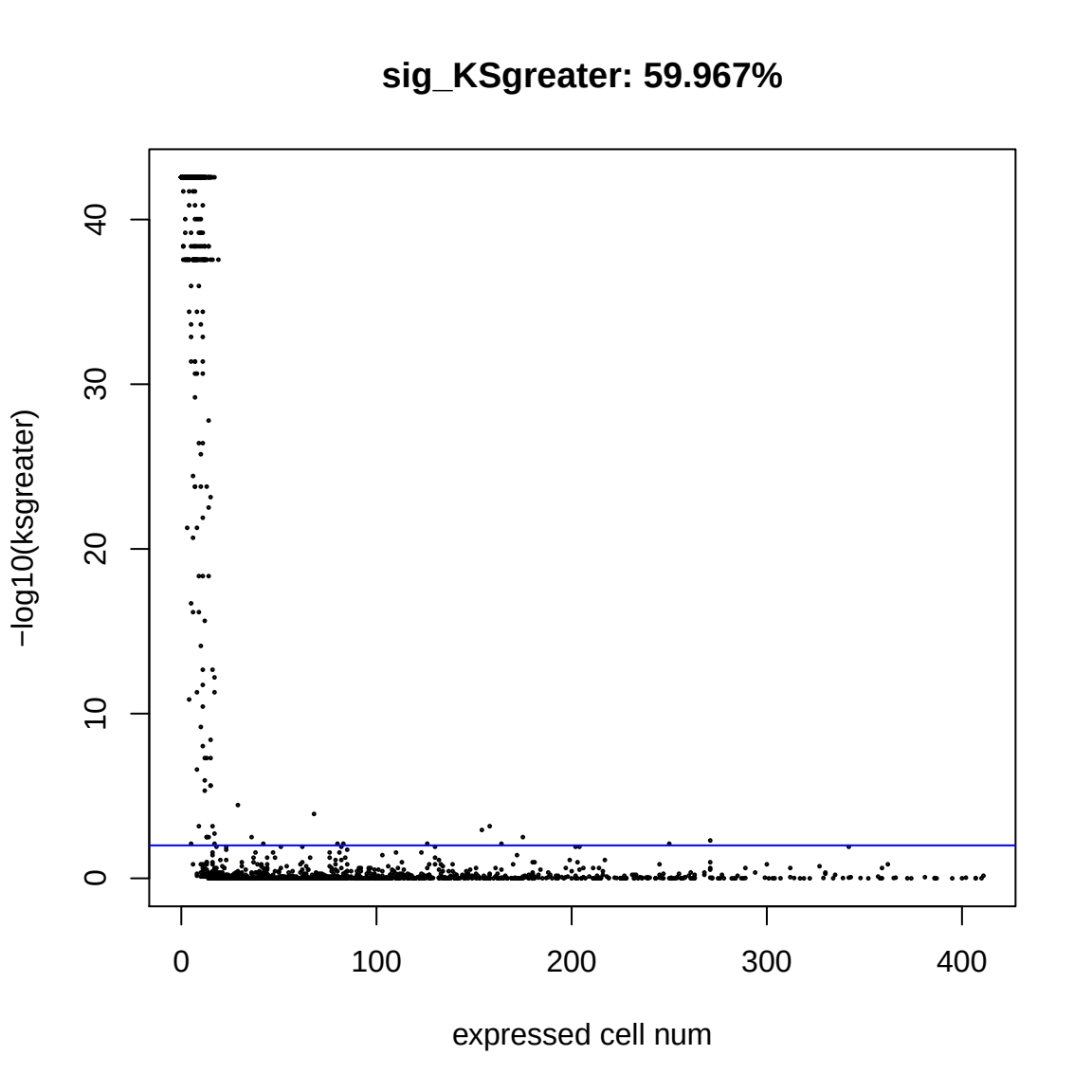

perm pvalues,exprM_0zero_num<1
Frequency
0
500
1000
0.2
0.4
0.6
0.8
1.0
rawp[exprM_0zero_num < 10]
n=1672, ks_pval=0

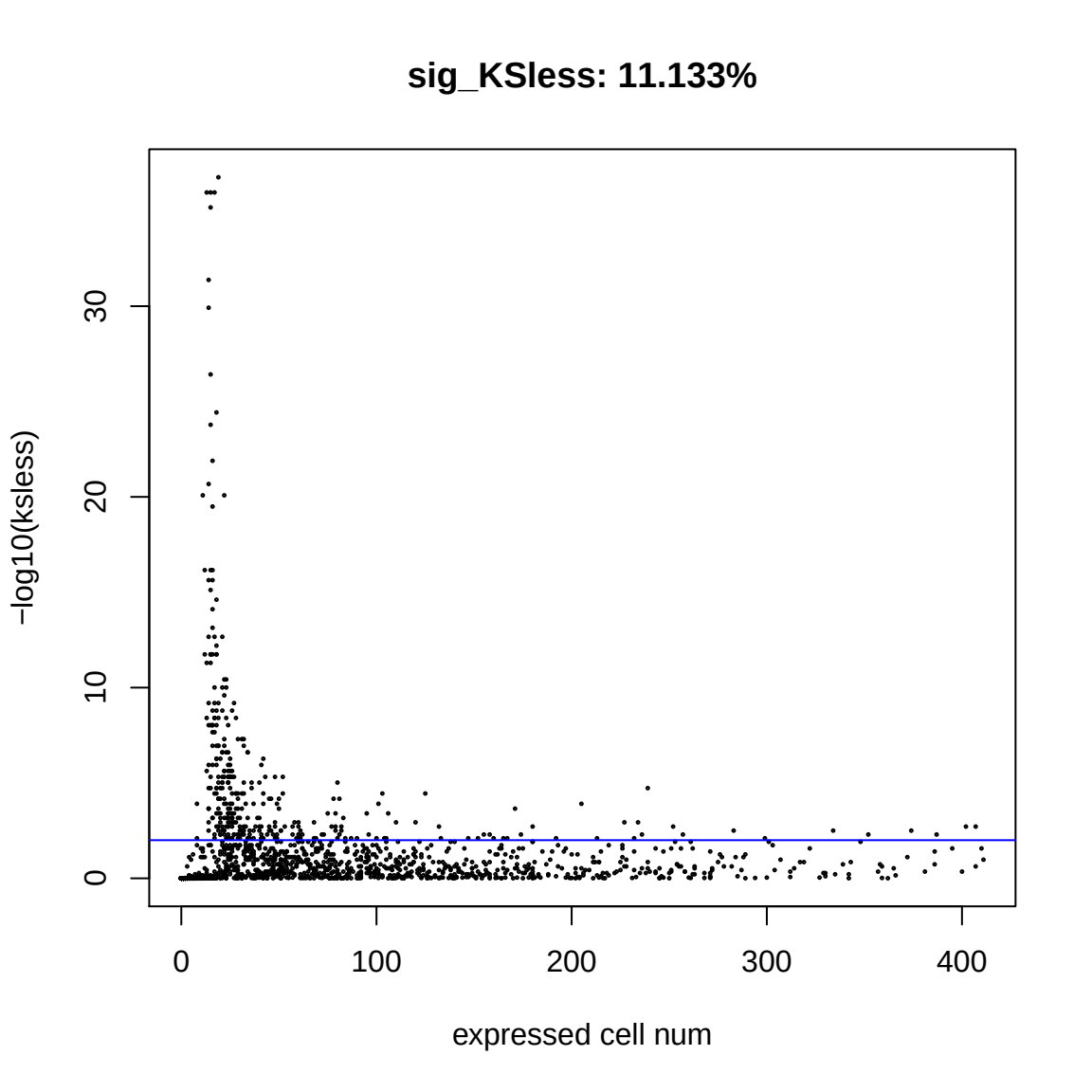

perm pvalues,exprM_0zero_num 10−
Frequency
0
20
60
100
0.0
0.2
0.4
0.6
0.8
1.0
awp[exprM_0zero_num >= 10 & exprM_0zero_nu
n=404, ks_pval=9.48114919907539e−11

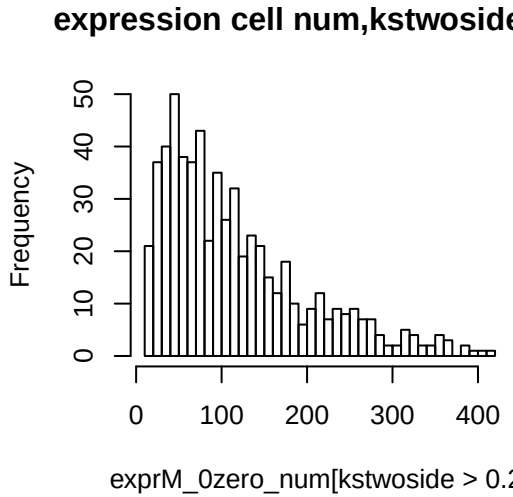

perm pvalues,exprM_0zero_num>3
Frequency
0
20
40
60
0.0
0.2
0.4
0.6
0.8
1.0
rawp[exprM_0zero_num >= 30]
n=924, ks_pval=0.558997926403963

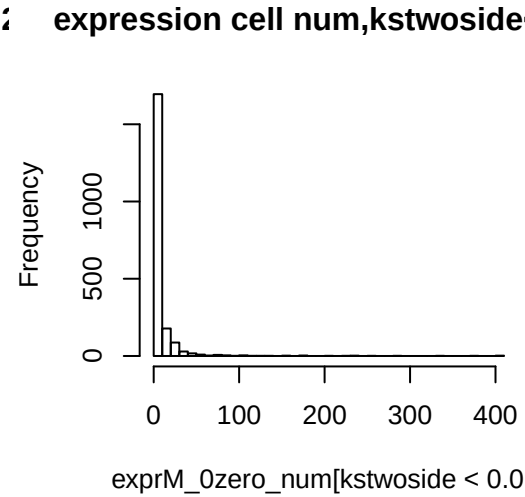

perm pvalues
Frequency
0
500
1000
1500
0.0
0.2
0.4
0.6
0.8
1.0
rawp

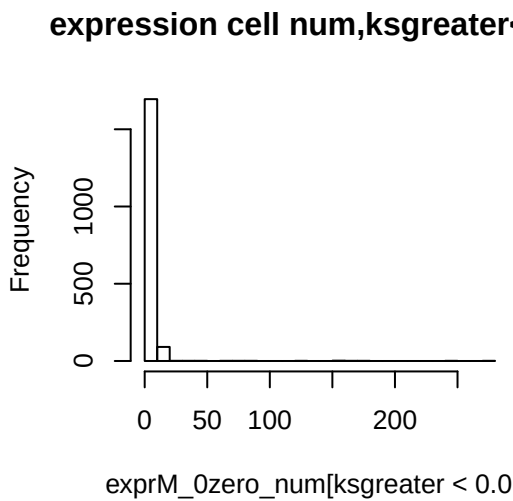

sig_KStwoside: 68.4%
−log10(kstwoside)
0
5
10
15
0
100
200
300
400
expressed cell num

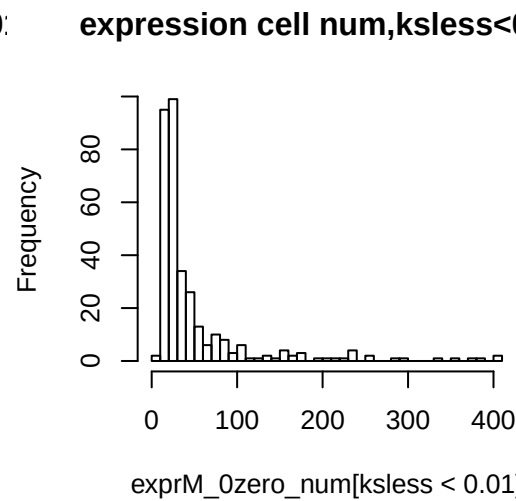

sig_KSgreater: 59.967%
−log10(ksgreater)
0
10
20
30
40
0
100
200
300
400
expressed cell num

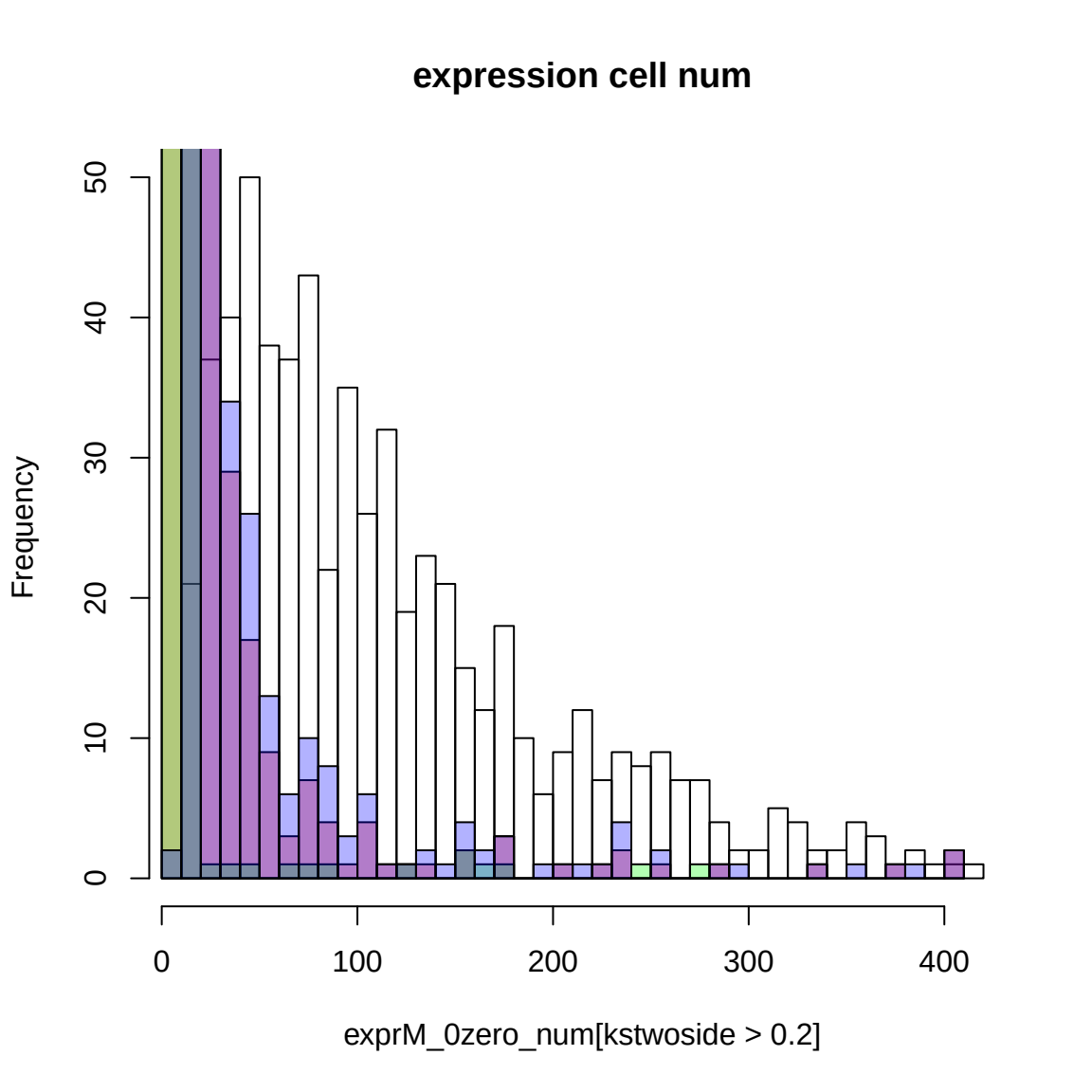

sig_KSless: 11.133%
−log10(ksless)
0
10
20
30
0
100
200
300
400
expressed cell num

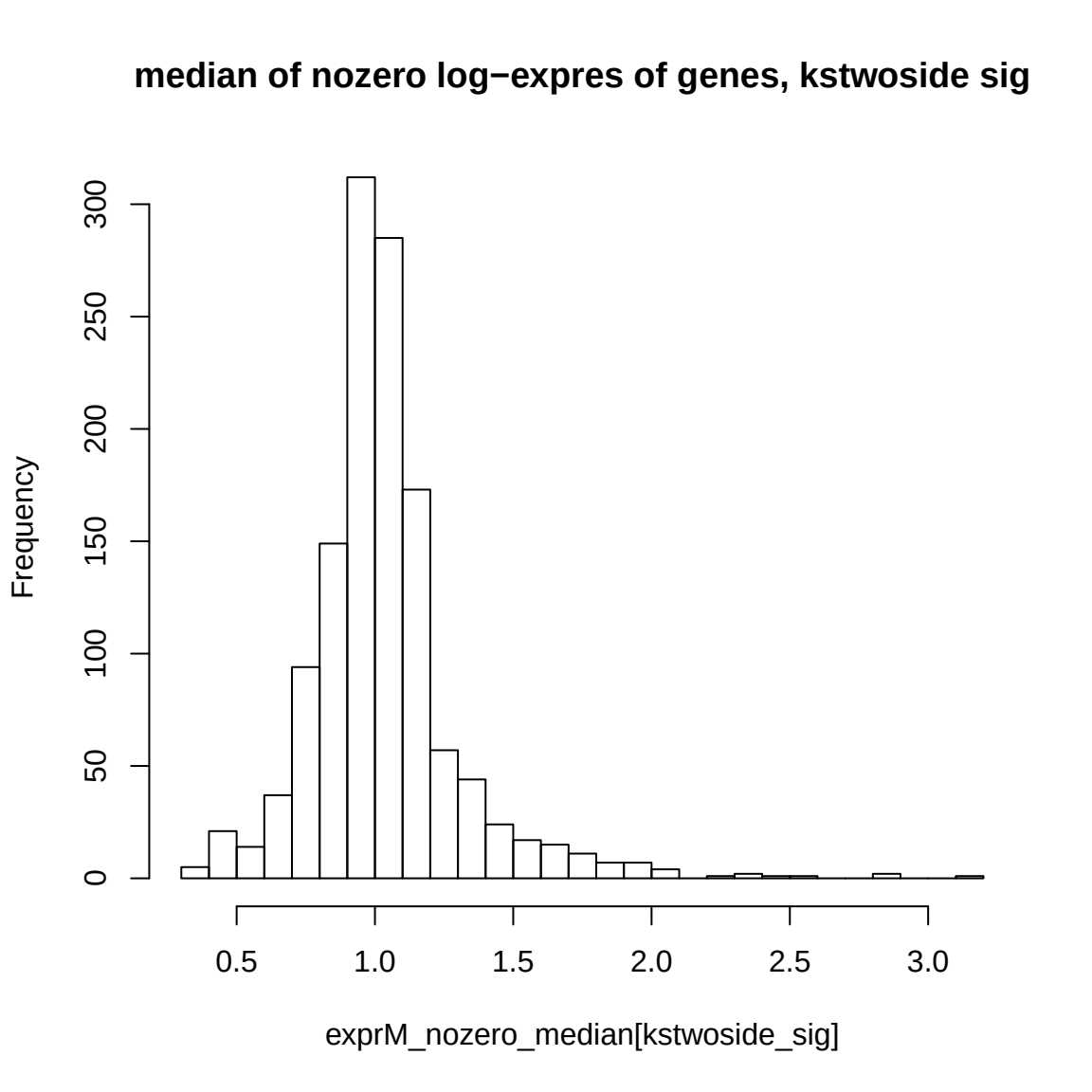

expression cell num,kstwoside>0.2
Frequency
0
10
20
30
40
50
0
100
200
300
400
exprM_0zero_num[kstwoside > 0.2]

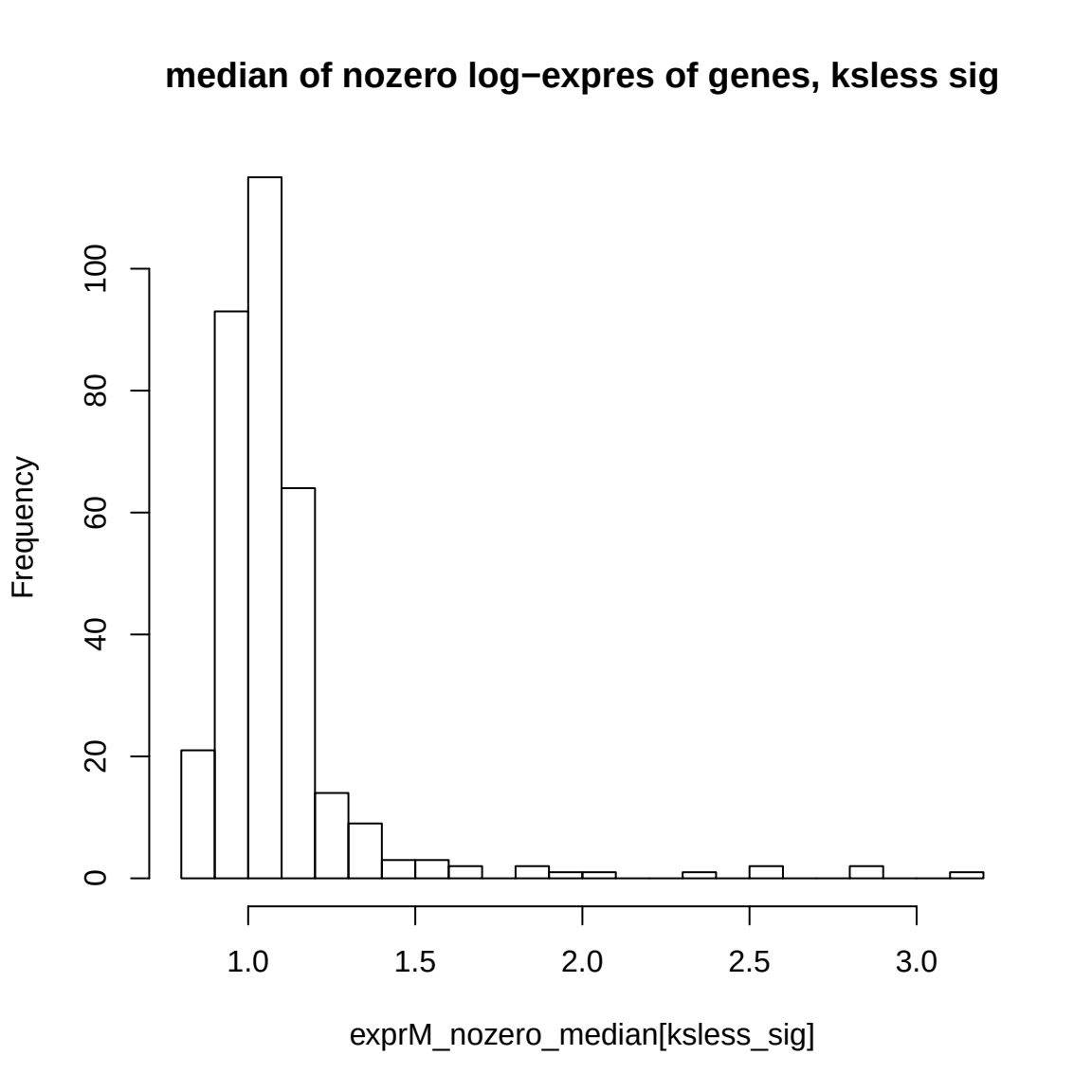

expression cell num,kstwoside<0.0
Frequency
0
500
1000
0
100
200
300
400
exprM_0zero_num[kstwoside < 0.01]

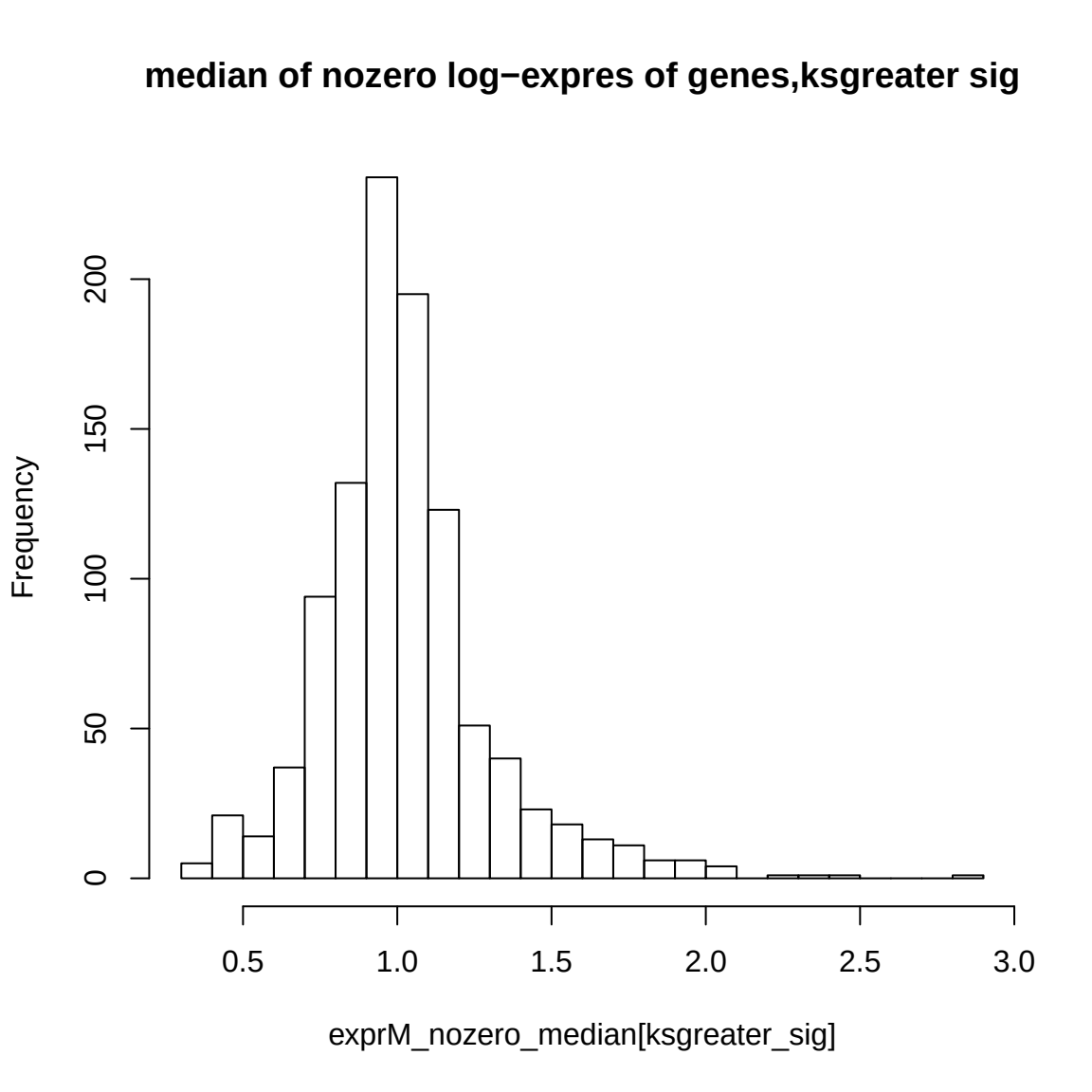

expression cell num,ksgreater<0.0
Frequency
0
500
1000
0
50
100
200
exprM_0zero_num[ksgreater < 0.01]

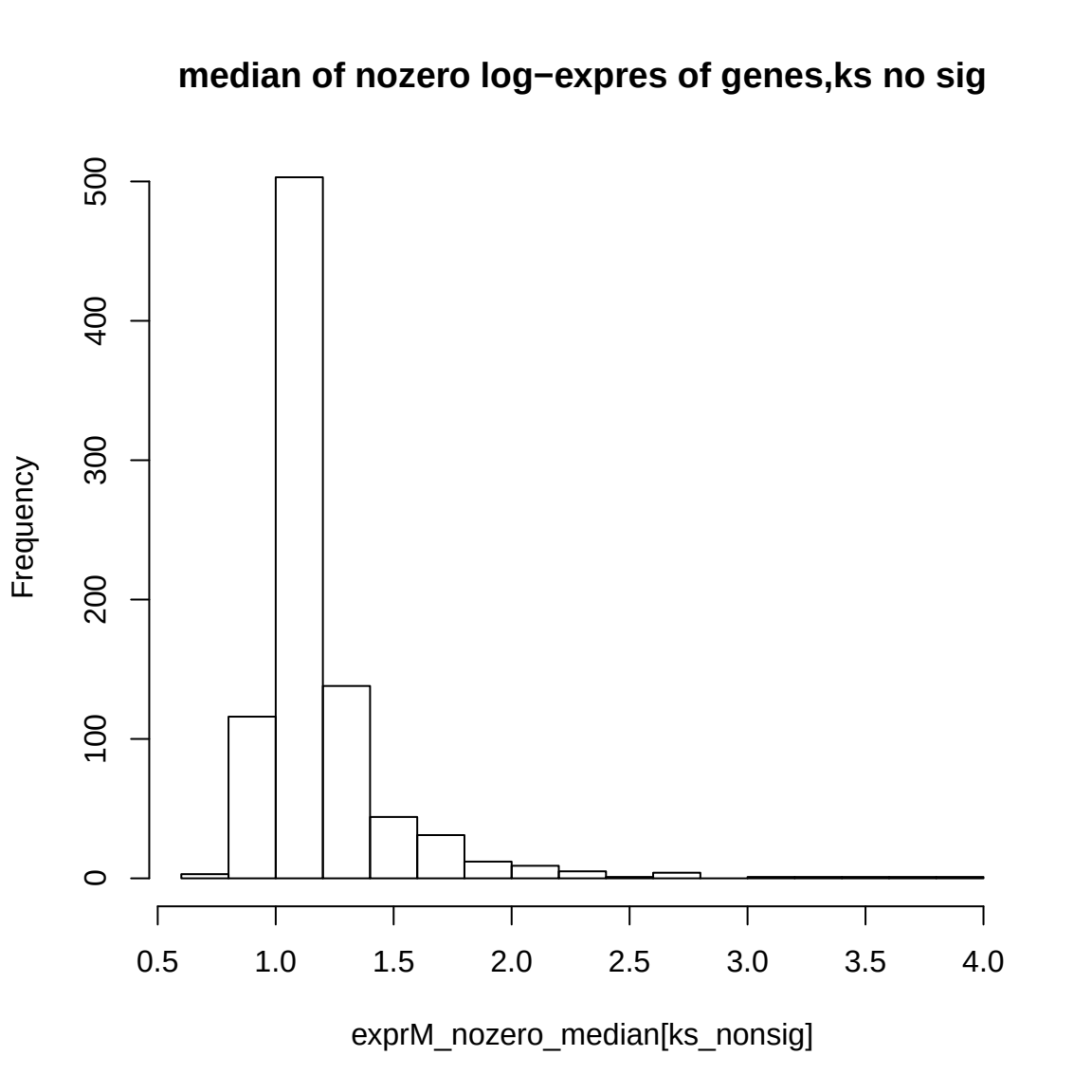

expression cell num,ksless<0.01
Frequency
0
20
40
60
80
0
100
200
300
400
exprM_0zero_num[ksless < 0.01]

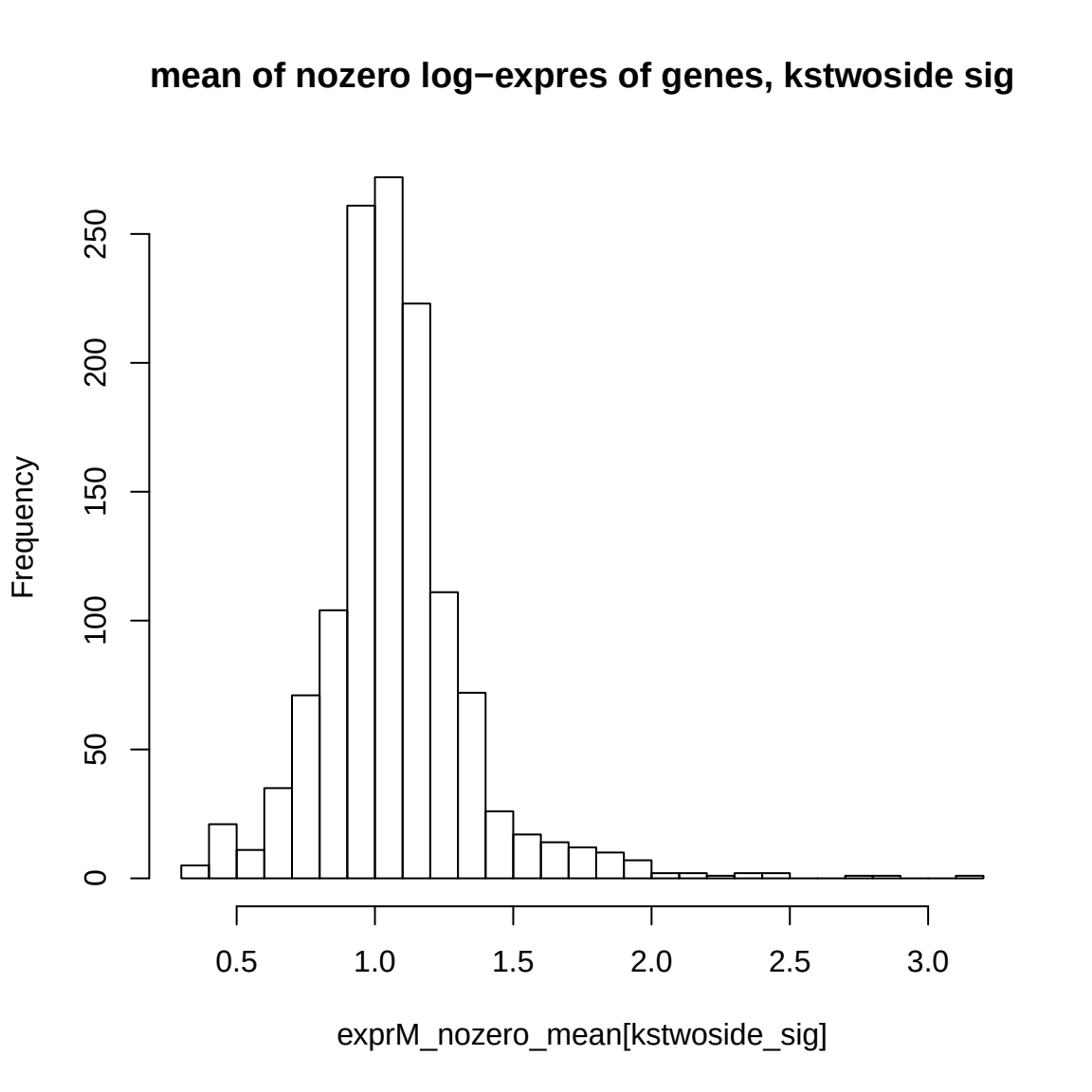

expression cell num
Frequency
0
10
20
30
40
50
0
100
200
300
400
exprM_0zero_num[kstwoside > 0.2]

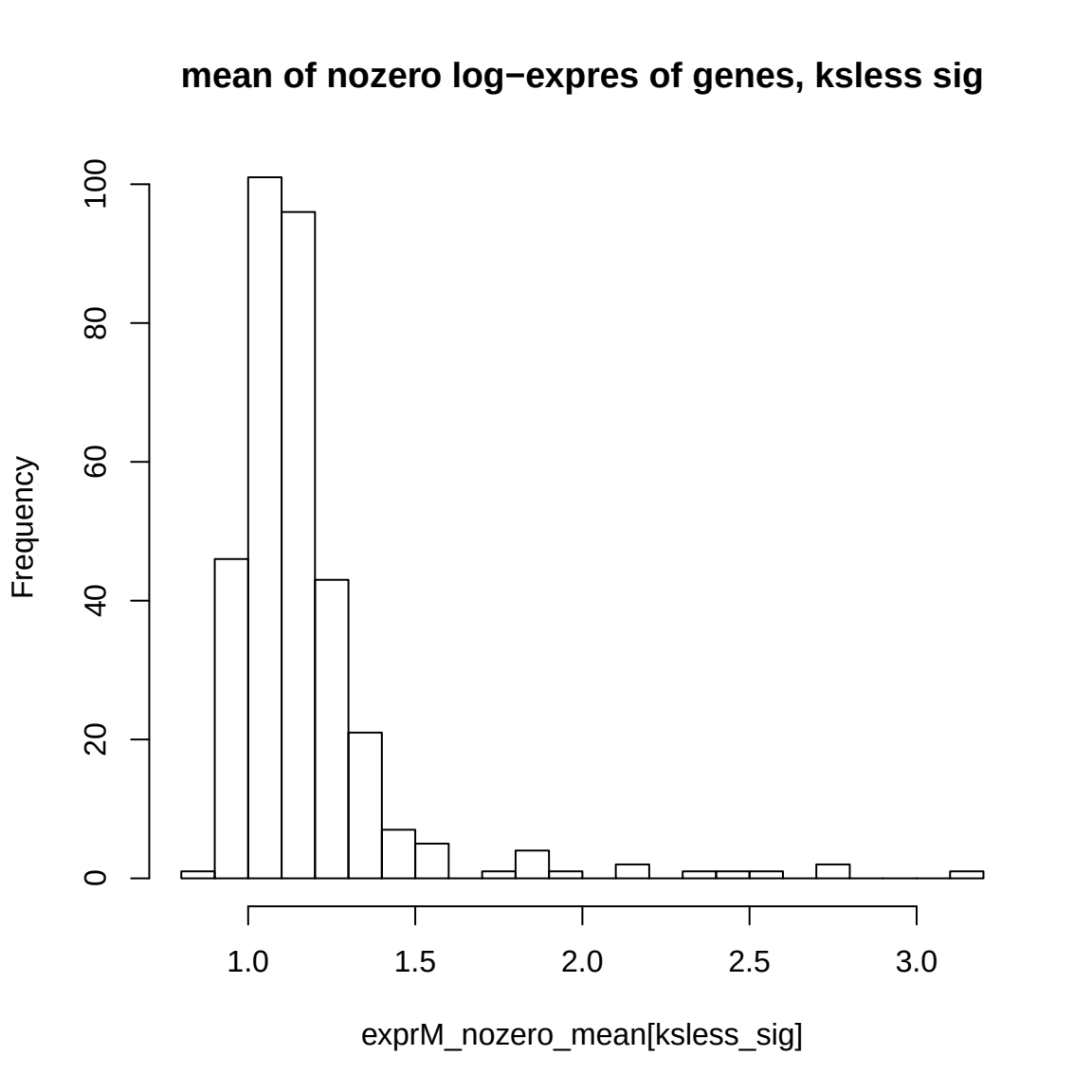

median of nozero log−expres of genes, kstwoside sig
Frequency
0
50
100
150
200
250
300
0.5
1.0
1.5
2.0
2.5
3.0
exprM_nozero_median[kstwoside_sig]


median of nozero log−expres of genes, ksless sig
Frequency
0
20
40
60
80
100
1.0
1.5
2.0
2.5
3.0
exprM_nozero_median[ksless_sig]

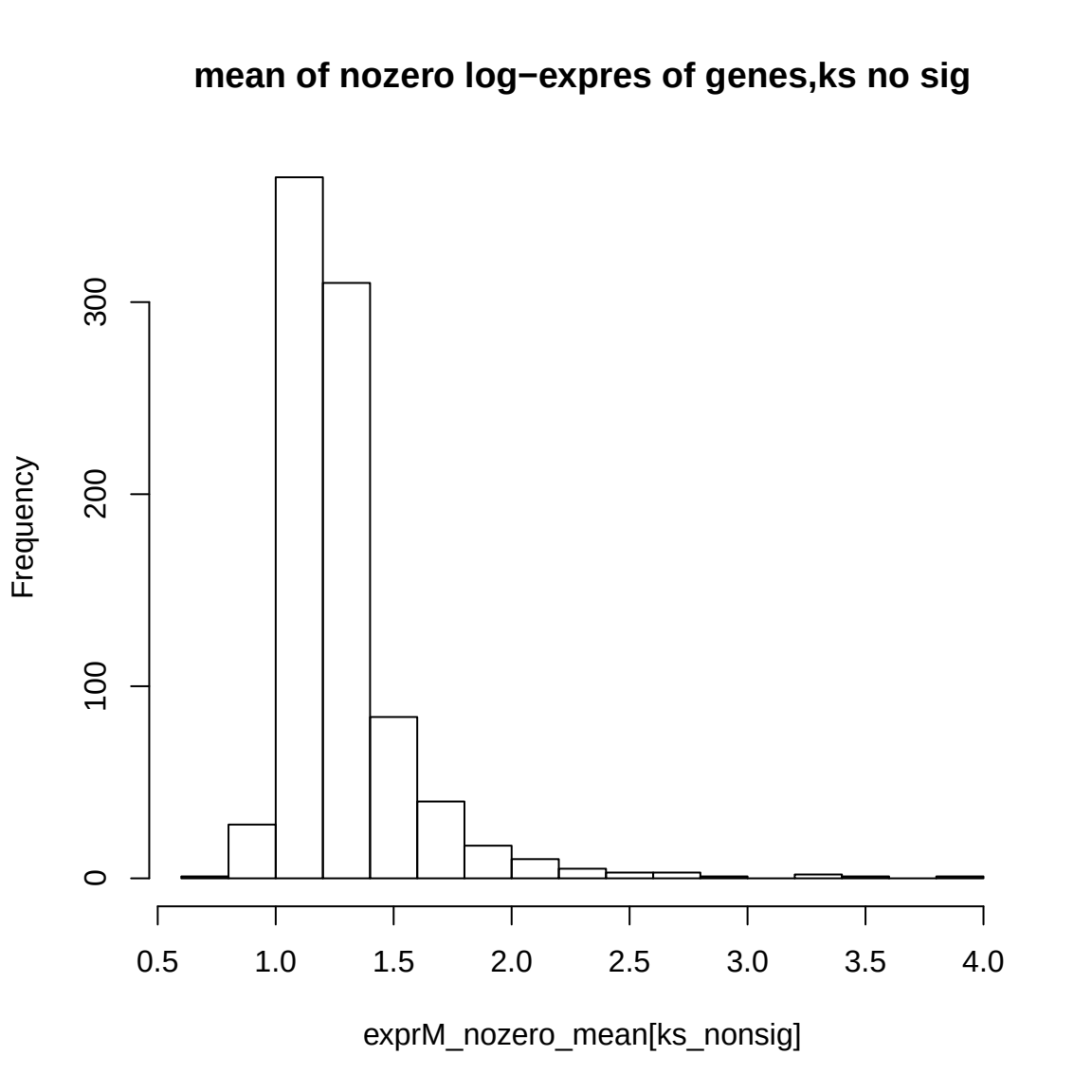

median of nozero log−expres of genes,ksgreater sig
Frequency
0
50
100
150
200
0.5
1.0
1.5
2.0
2.5
3.0
exprM_nozero_median[ksgreater_sig]

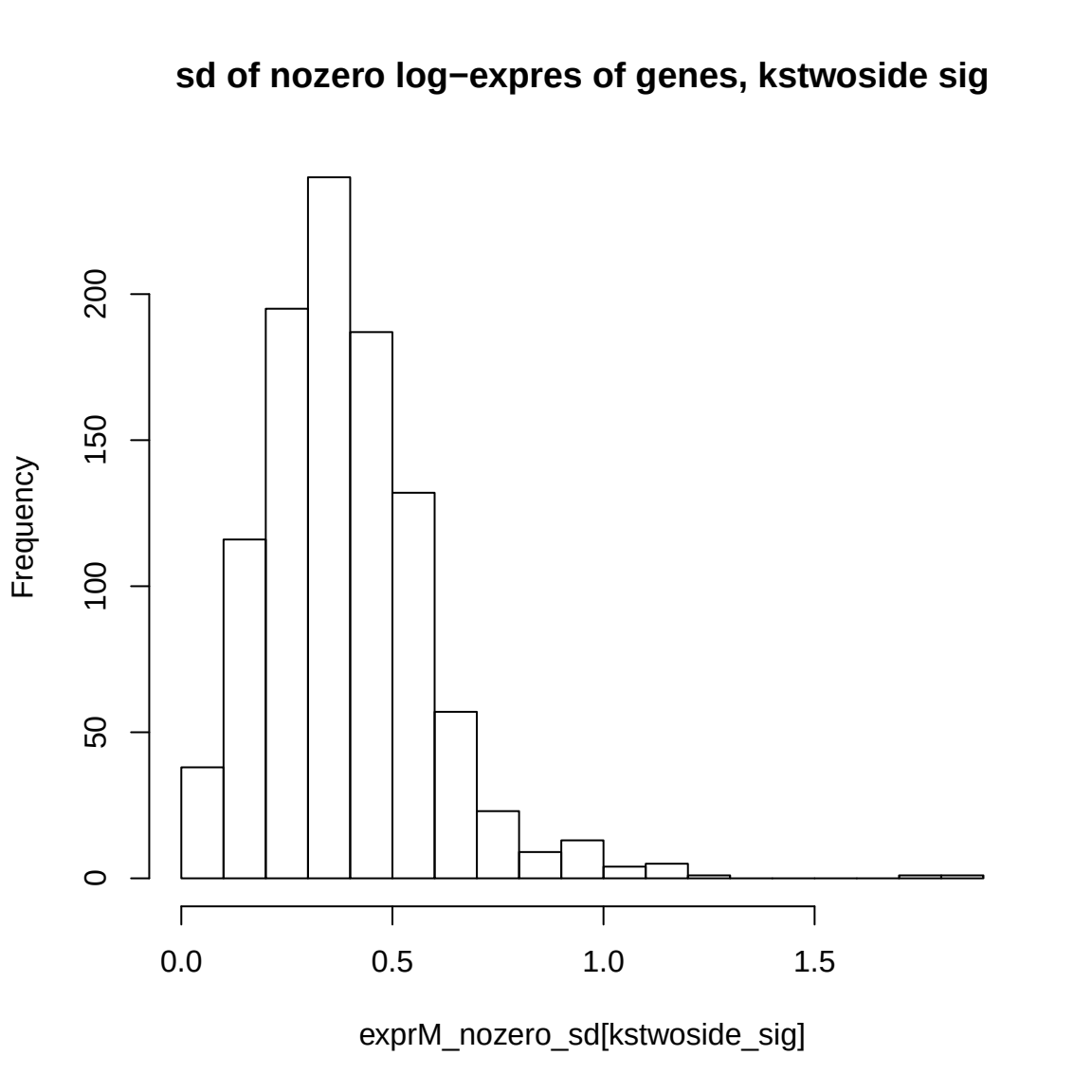

median of nozero log−expres of genes,ks no sig
Frequency
0
100
200
300
400
500
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
exprM_nozero_median[ks_nonsig]

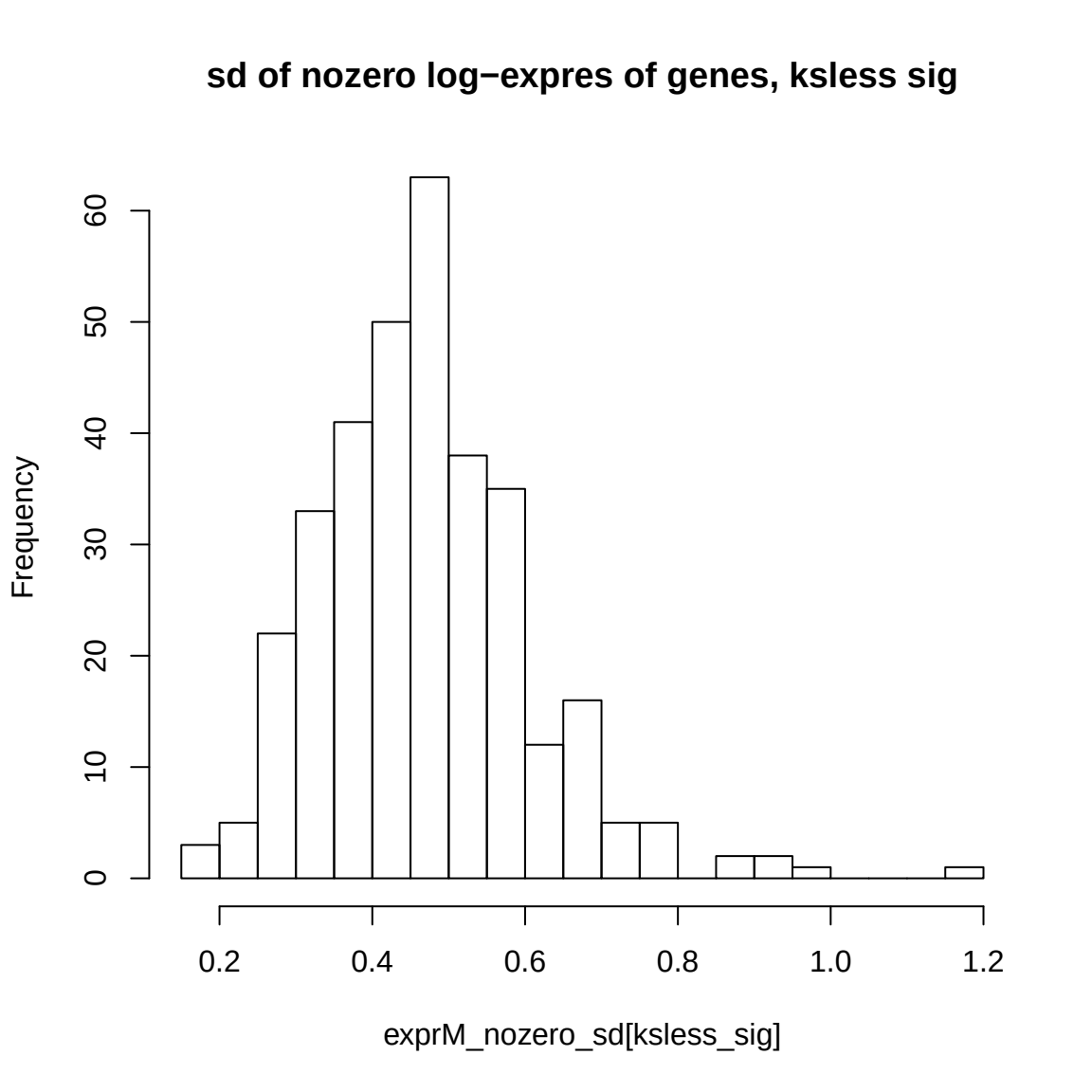

mean of nozero log−expres of genes, kstwoside sig
Frequency
0
50
100
150
200
250
0.5
1.0
1.5
2.0
2.5
3.0
exprM_nozero_mean[kstwoside_sig]

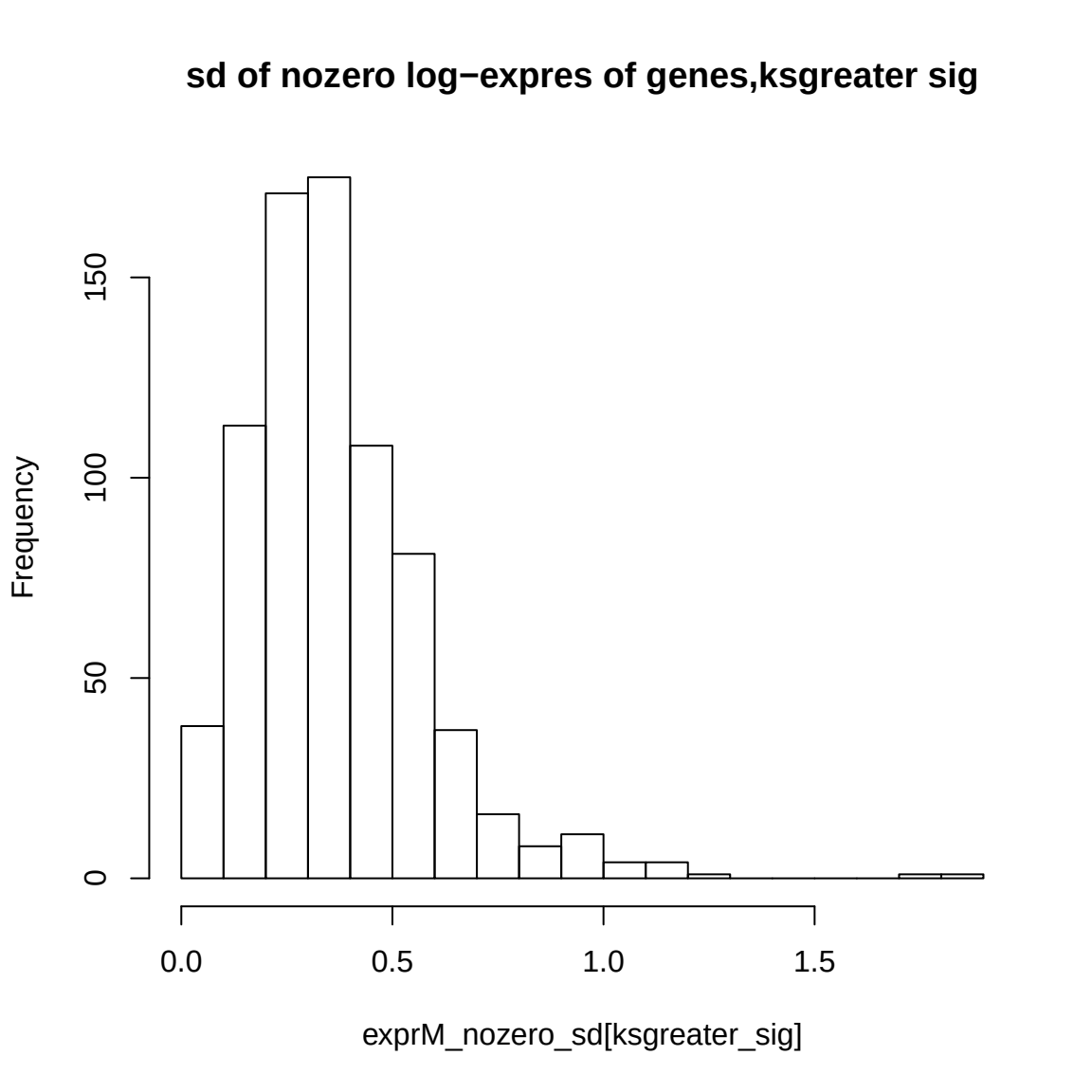

mean of nozero log−expres of genes, ksless sig
Frequency
0
20
40
60
80
100
1.0
1.5
2.0
2.5
3.0
exprM_nozero_mean[ksless_sig]

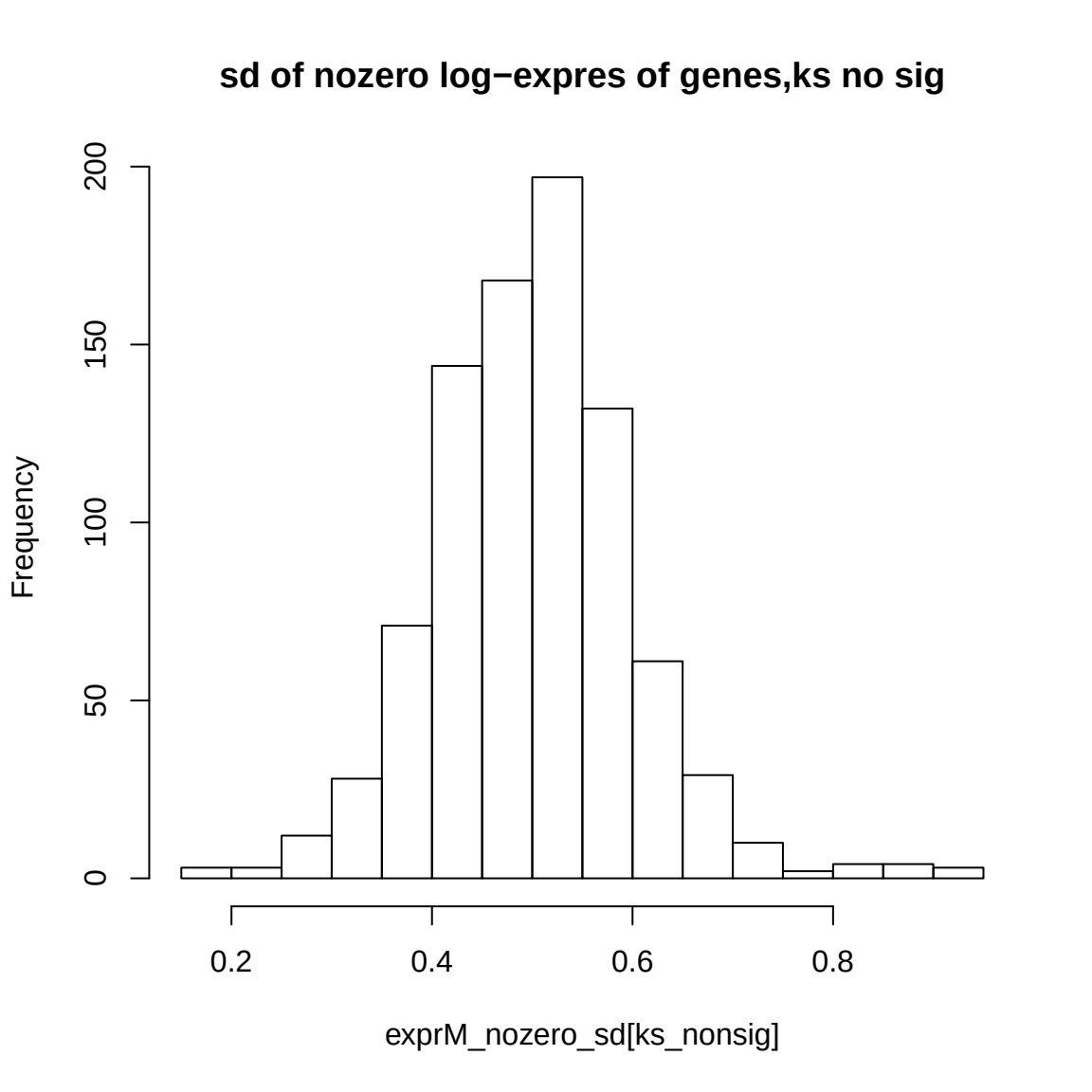
mean of nozero log−expres of genes,ksgreater sig
Frequency
0
50
100
150
200
0.5
1.0
1.5
2.0
2.5
3.0
exprM_nozero_mean[ksgreater_sig]

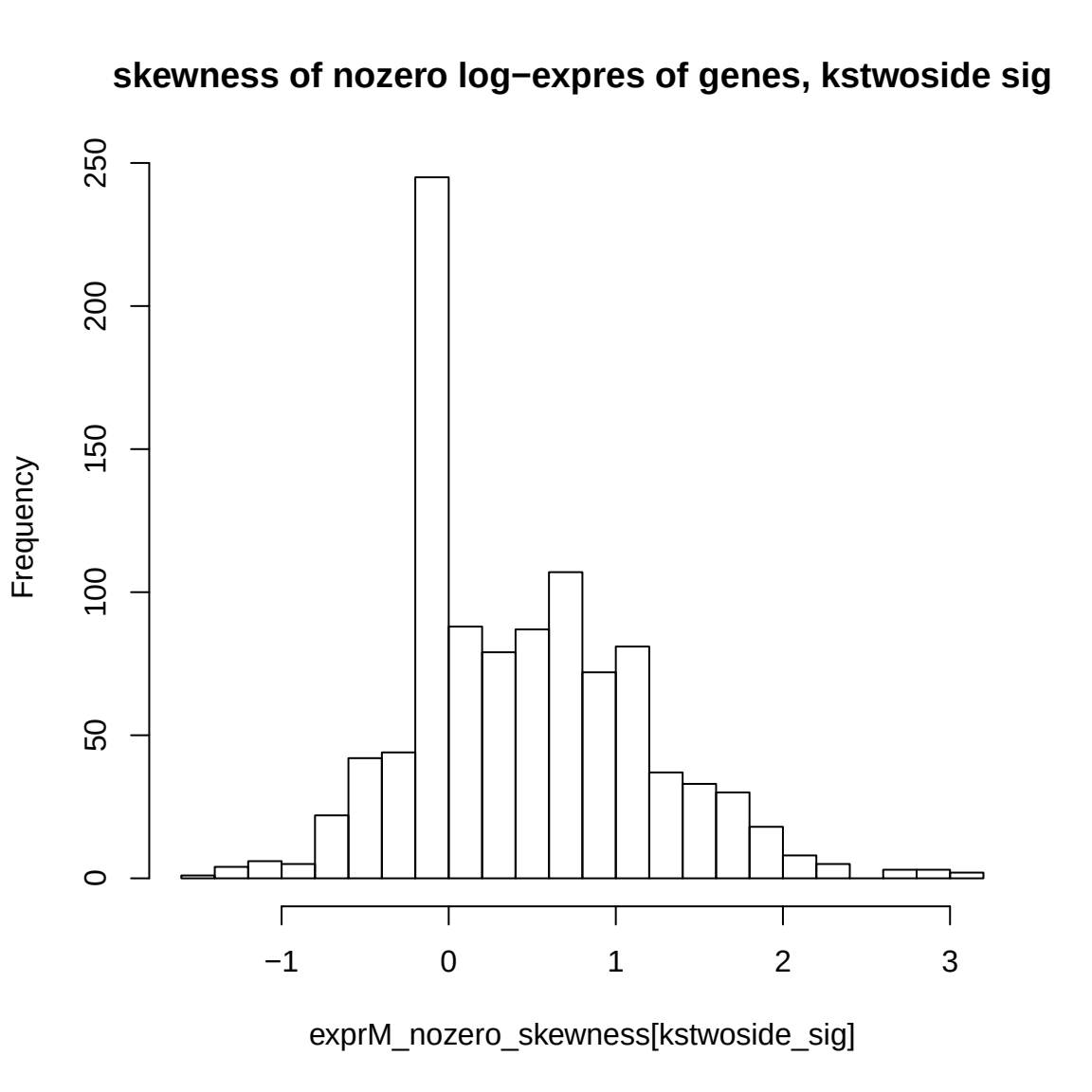

mean of nozero log−expres of genes,ks no sig
Frequency
0
100
200
300
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
exprM_nozero_mean[ks_nonsig]

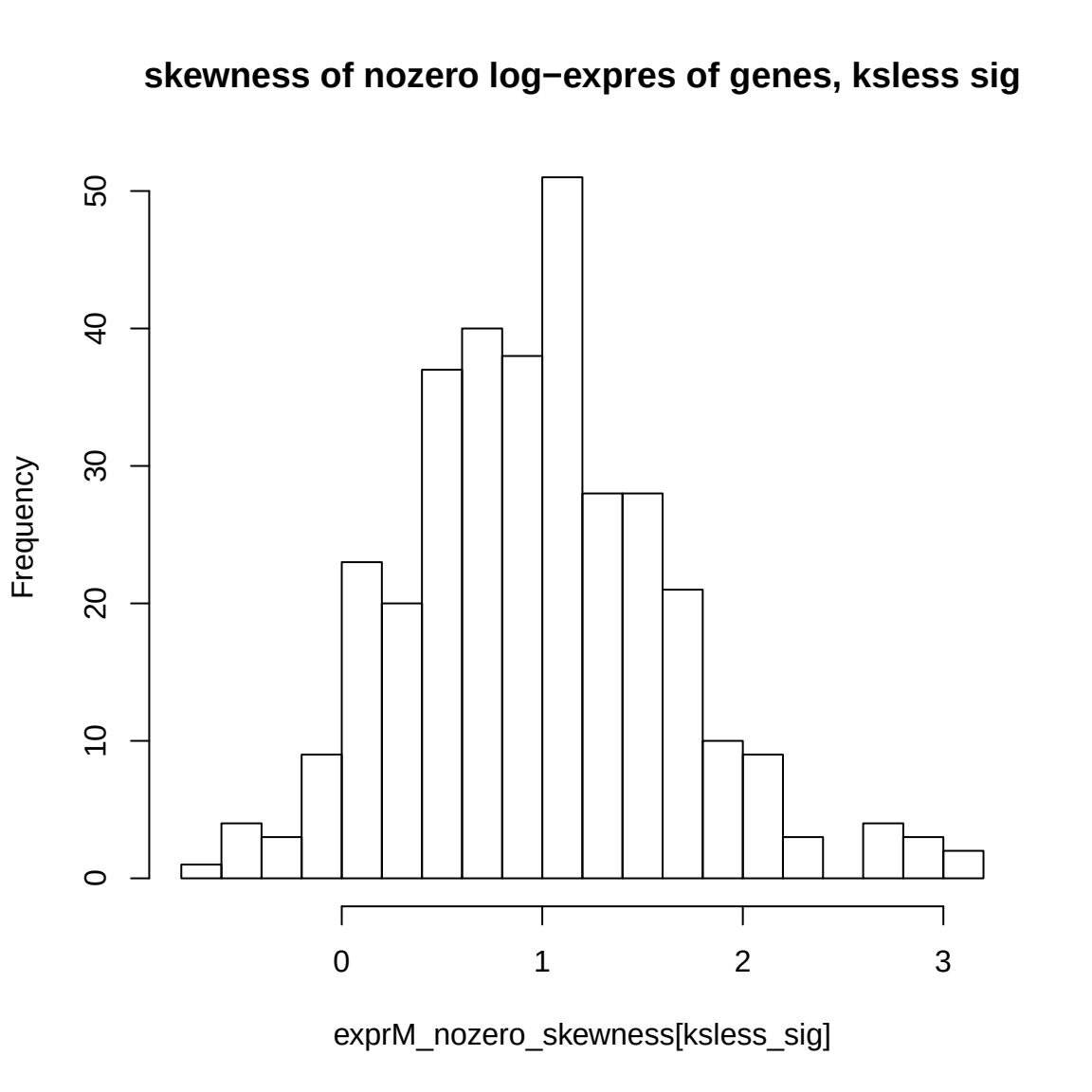

sd of nozero log−expres of genes, kstwoside sig
Frequency
0
50
100
150
200
0.0
0.5
1.0
1.5
exprM_nozero_sd[kstwoside_sig]

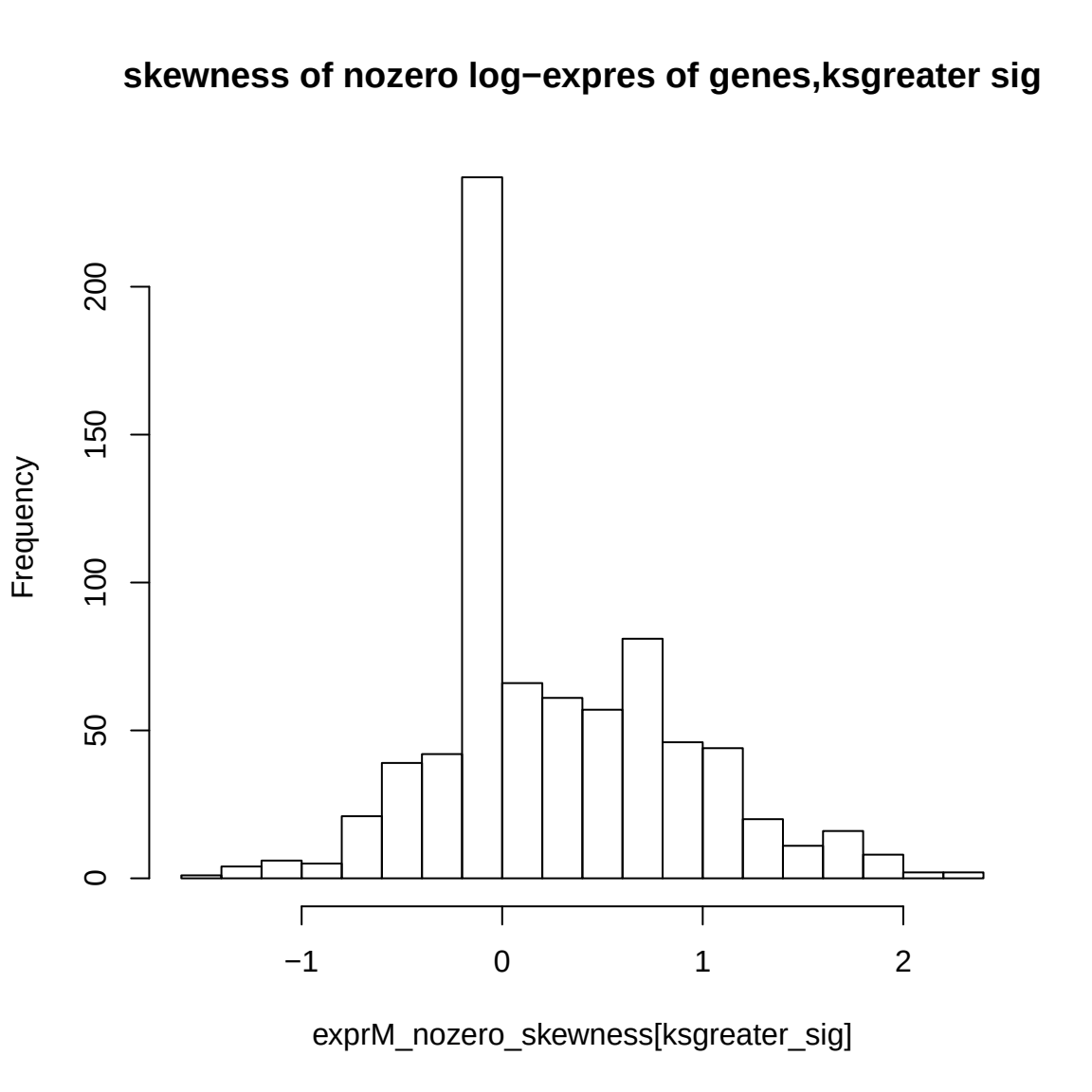

sd of nozero log−expres of genes, ksless sig
Frequency
0
10
20
30
40
50
60
0.2
0.4
0.6
0.8
1.0
1.2
exprM_nozero_sd[ksless_sig]

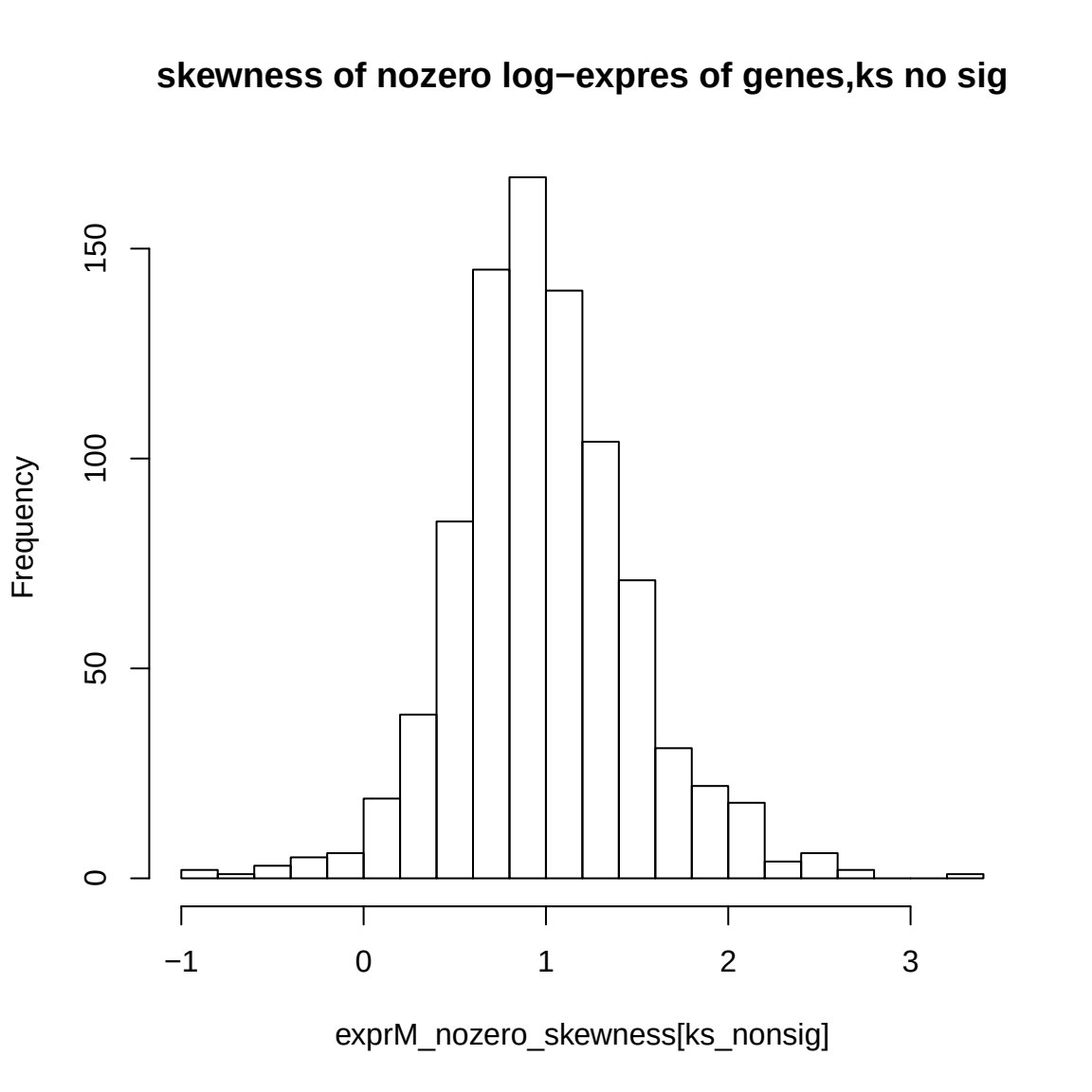

sd of nozero log−expres of genes,ksgreater sig
Frequency
0
50
100
150
0.0
0.5
1.0
1.5
exprM_nozero_sd[ksgreater_sig]

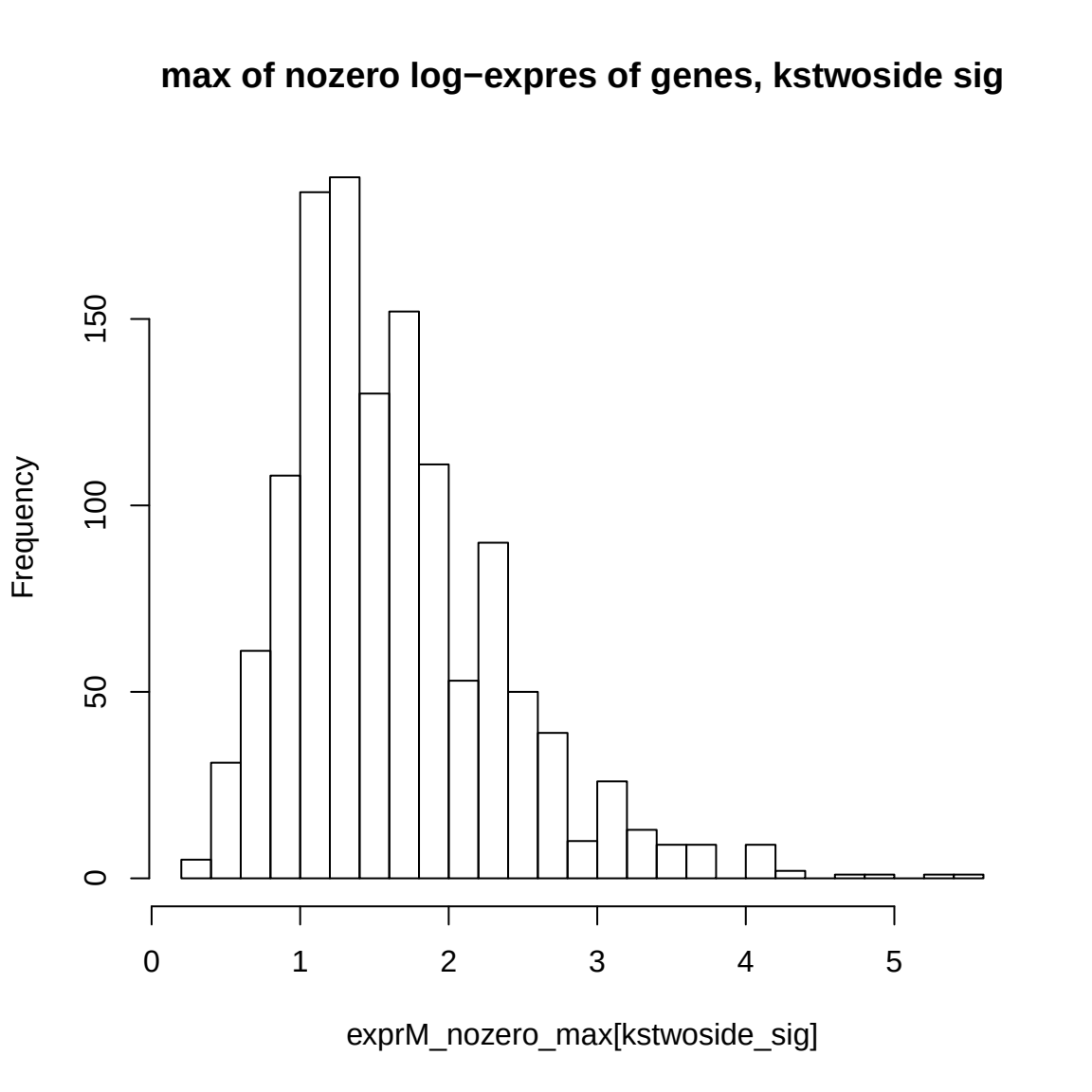

sd of nozero log−expres of genes,ks no sig
Frequency
0
50
100
150
200
0.2
0.4
0.6
0.8
exprM_nozero_sd[ks_nonsig]

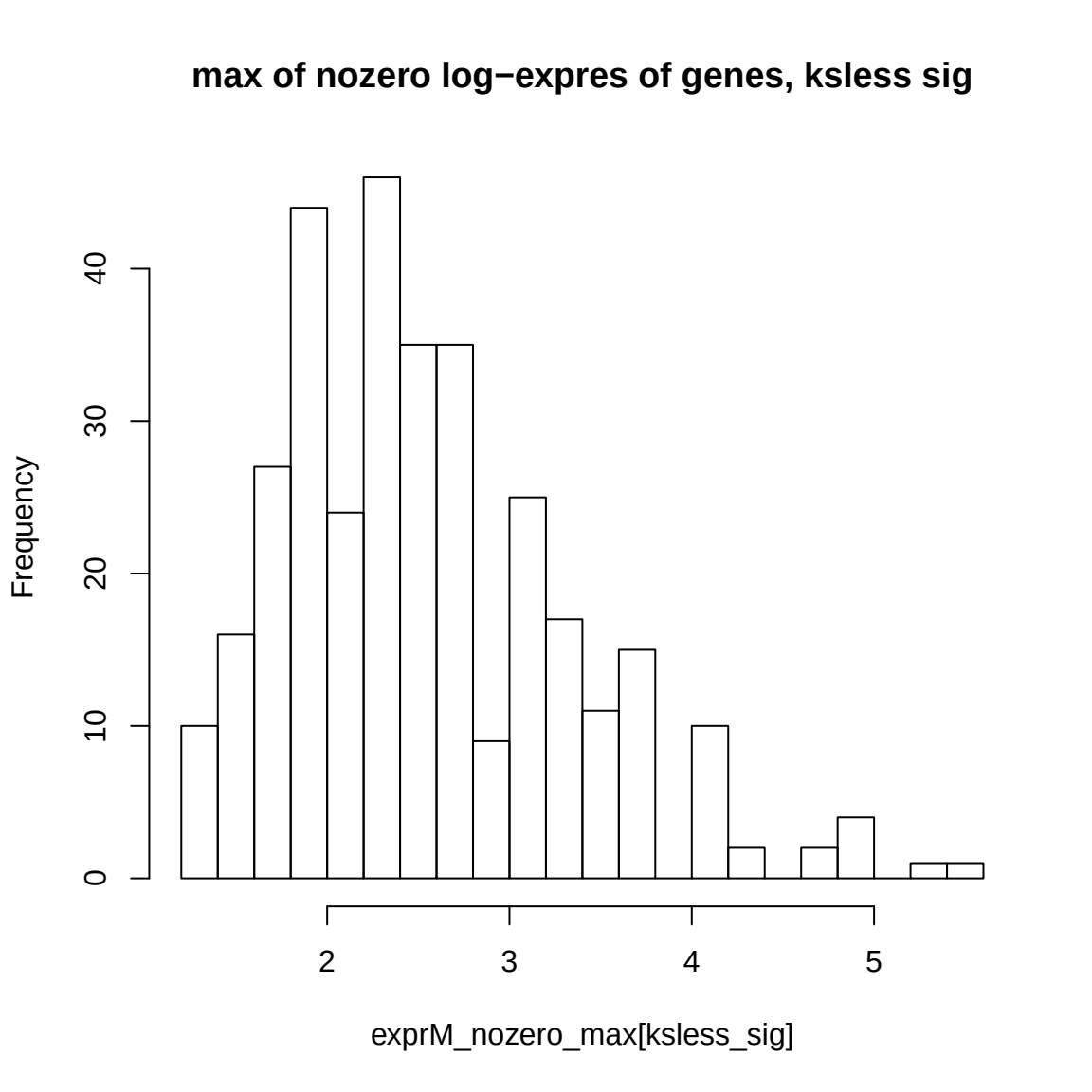

skewness of nozero log−expres of genes, kstwoside sig
Frequency
0
50
100
150
200
250
−1
0
1
2
3
exprM_nozero_skewness[kstwoside_sig]

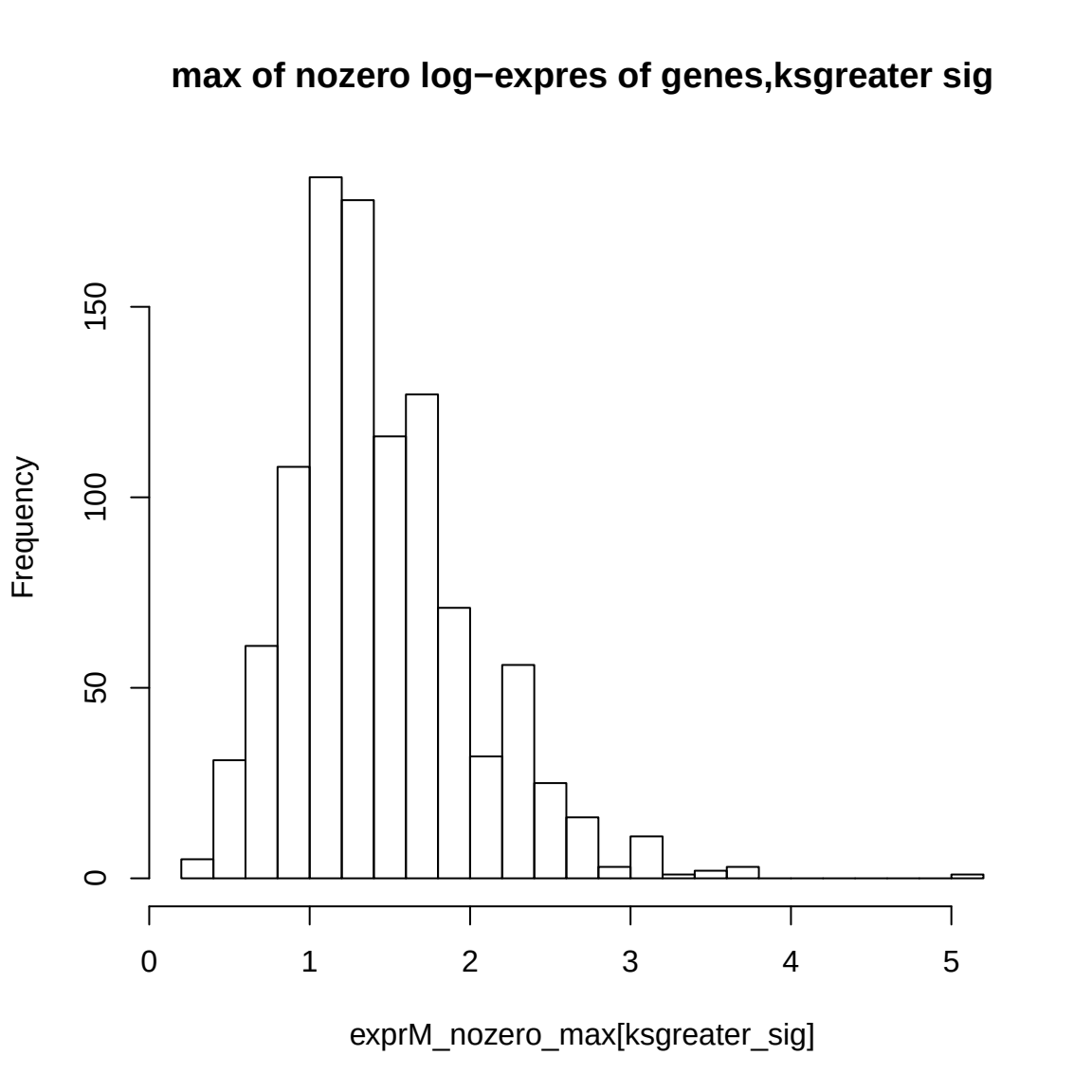

skewness of nozero log−expres of genes, ksless sig
Frequency
0
10
20
30
40
50
0
1
2
3
exprM_nozero_skewness[ksless_sig]

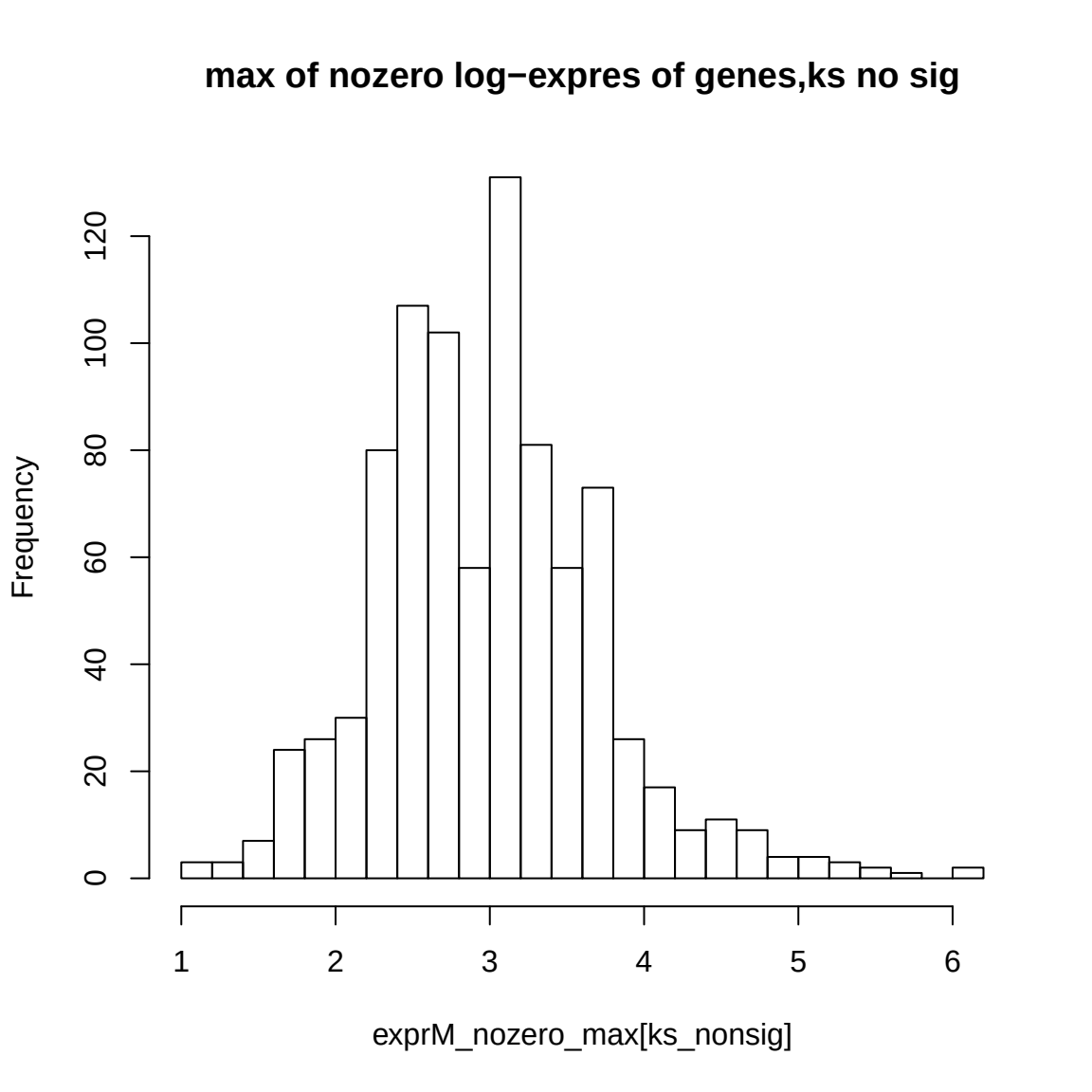

skewness of nozero log−expres of genes,ksgreater sig
Frequency
0
50
100
150
200
−1
0
1
2
exprM_nozero_skewness[ksgreater_sig]

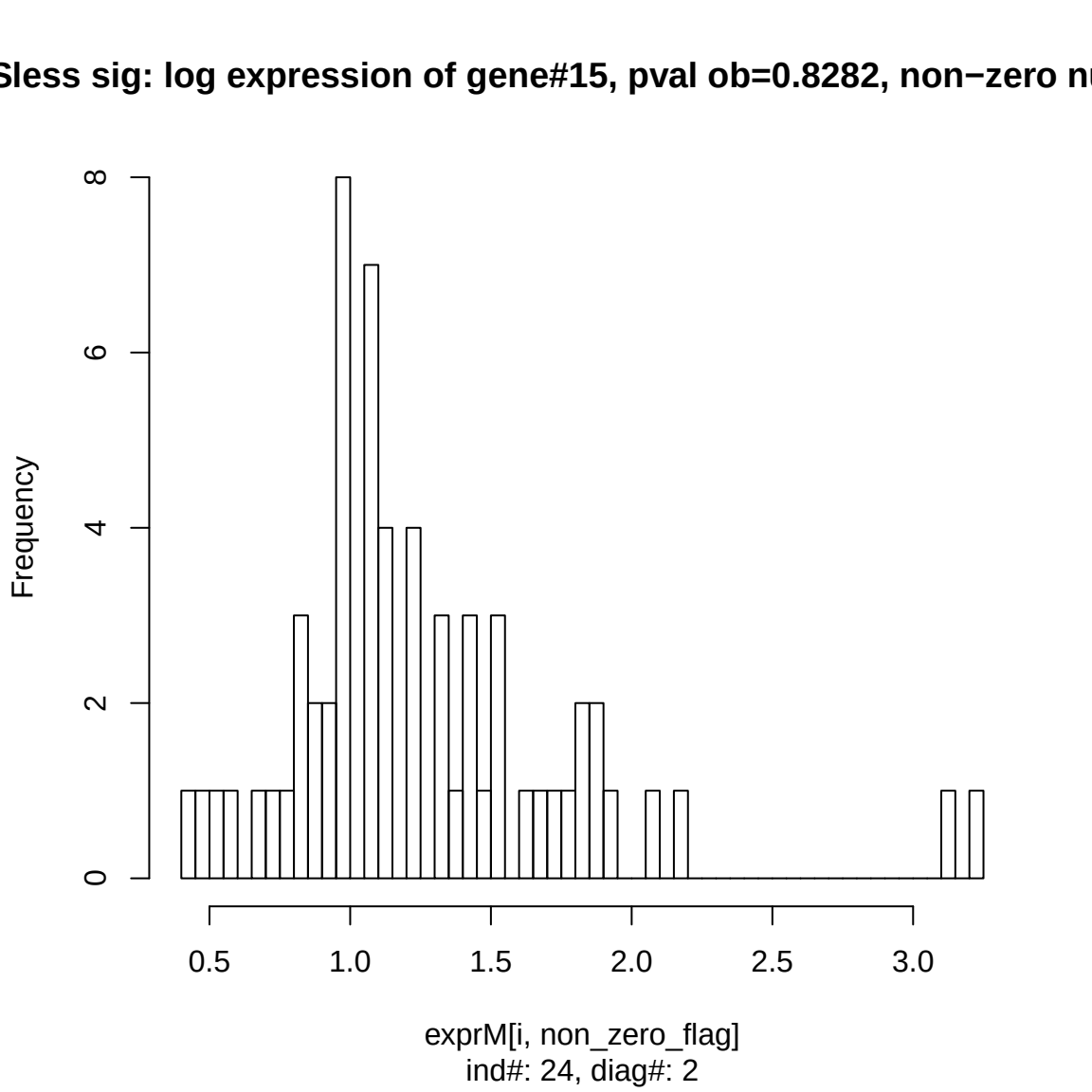

skewness of nozero log−expres of genes,ks no sig
Frequency
0
50
100
150
−1
0
1
2
3
exprM_nozero_skewness[ks_nonsig]

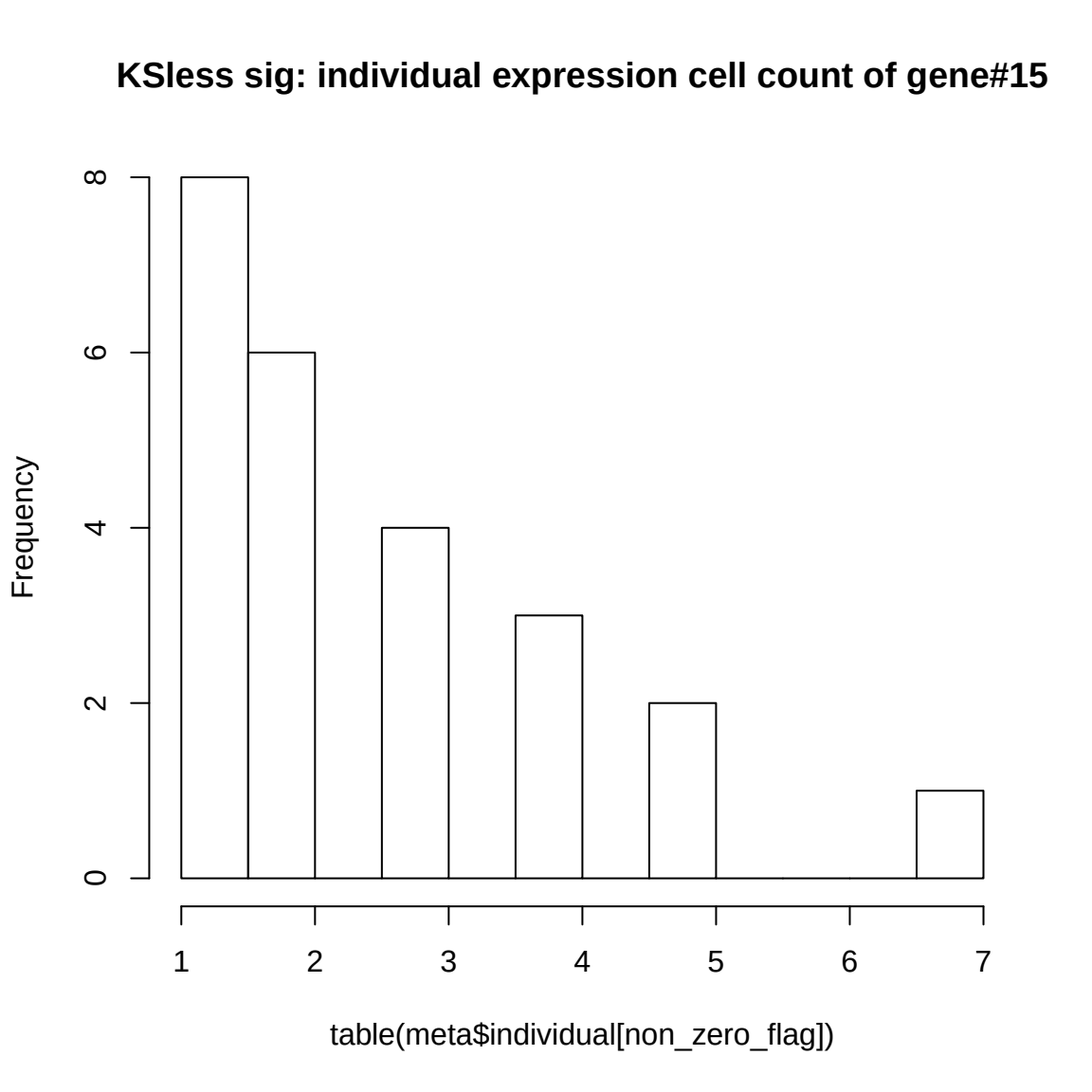

max of nozero log−expres of genes, kstwoside sig
Frequency
0
50
100
150
0
1
2
3
4
5
exprM_nozero_max[kstwoside_sig]

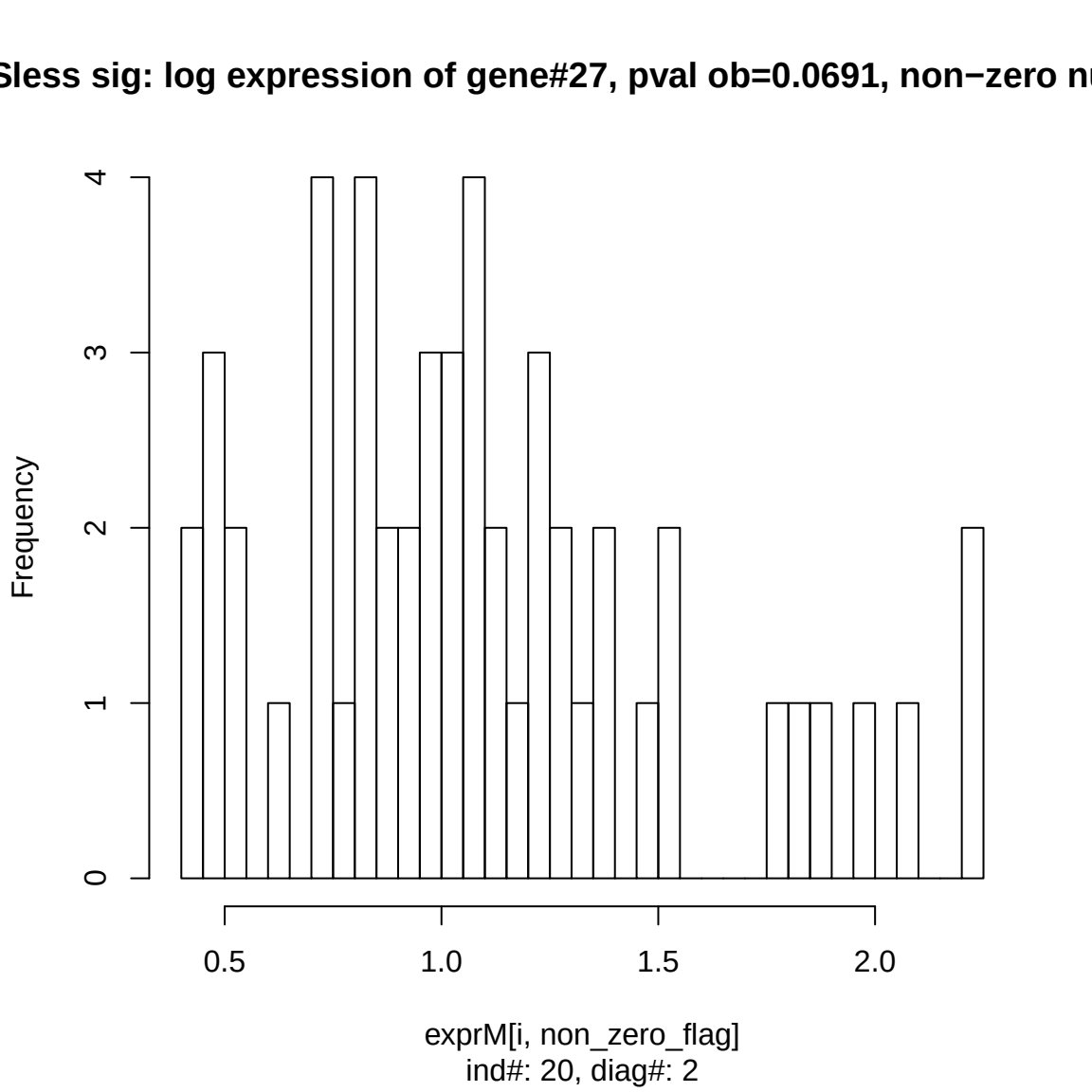

max of nozero log−expres of genes, ksless sig
Frequency
0
10
20
30
40
2
3
4
5
exprM_nozero_max[ksless_sig]

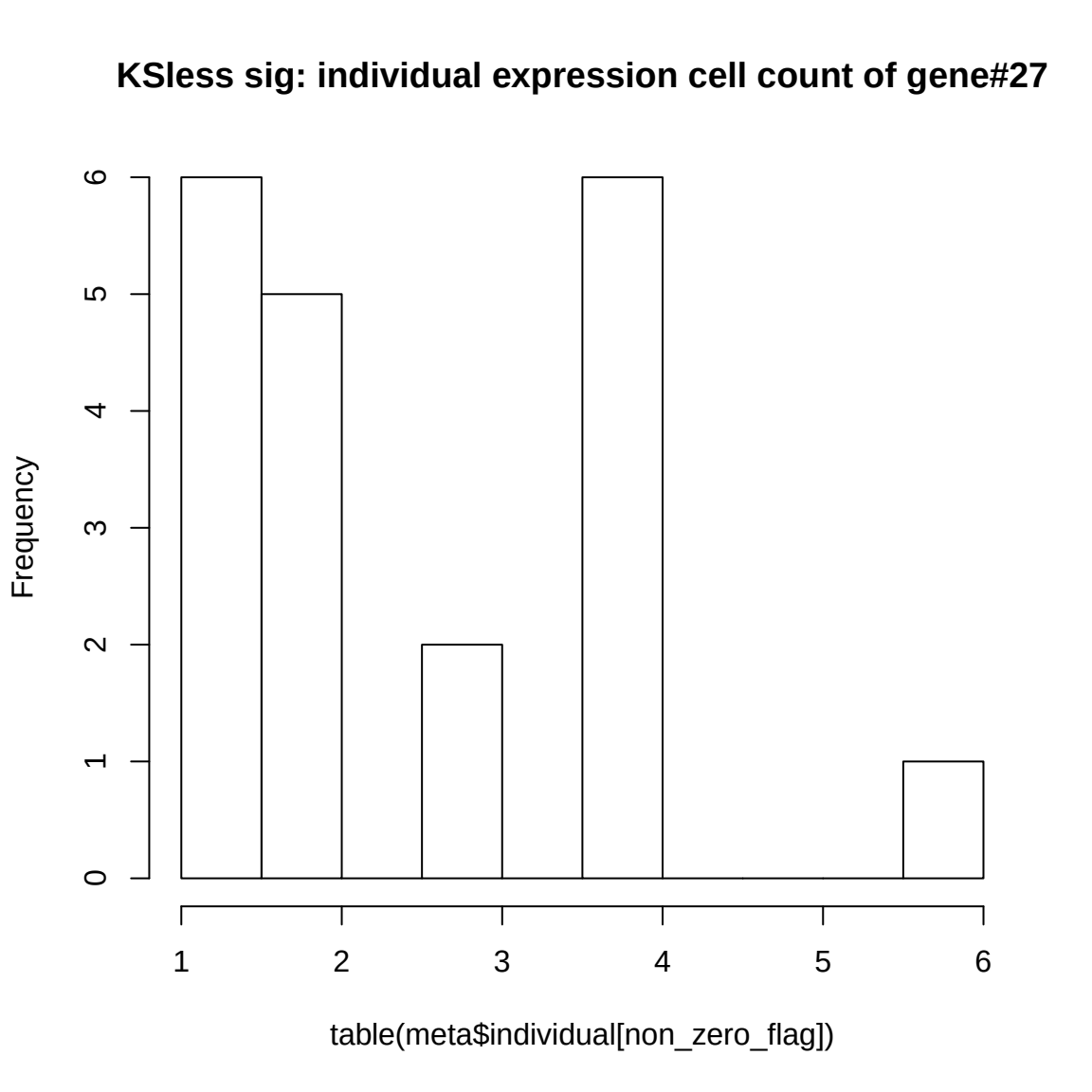

max of nozero log−expres of genes,ksgreater sig
Frequency
0
50
100
150
0
1
2
3
4
5
exprM_nozero_max[ksgreater_sig]

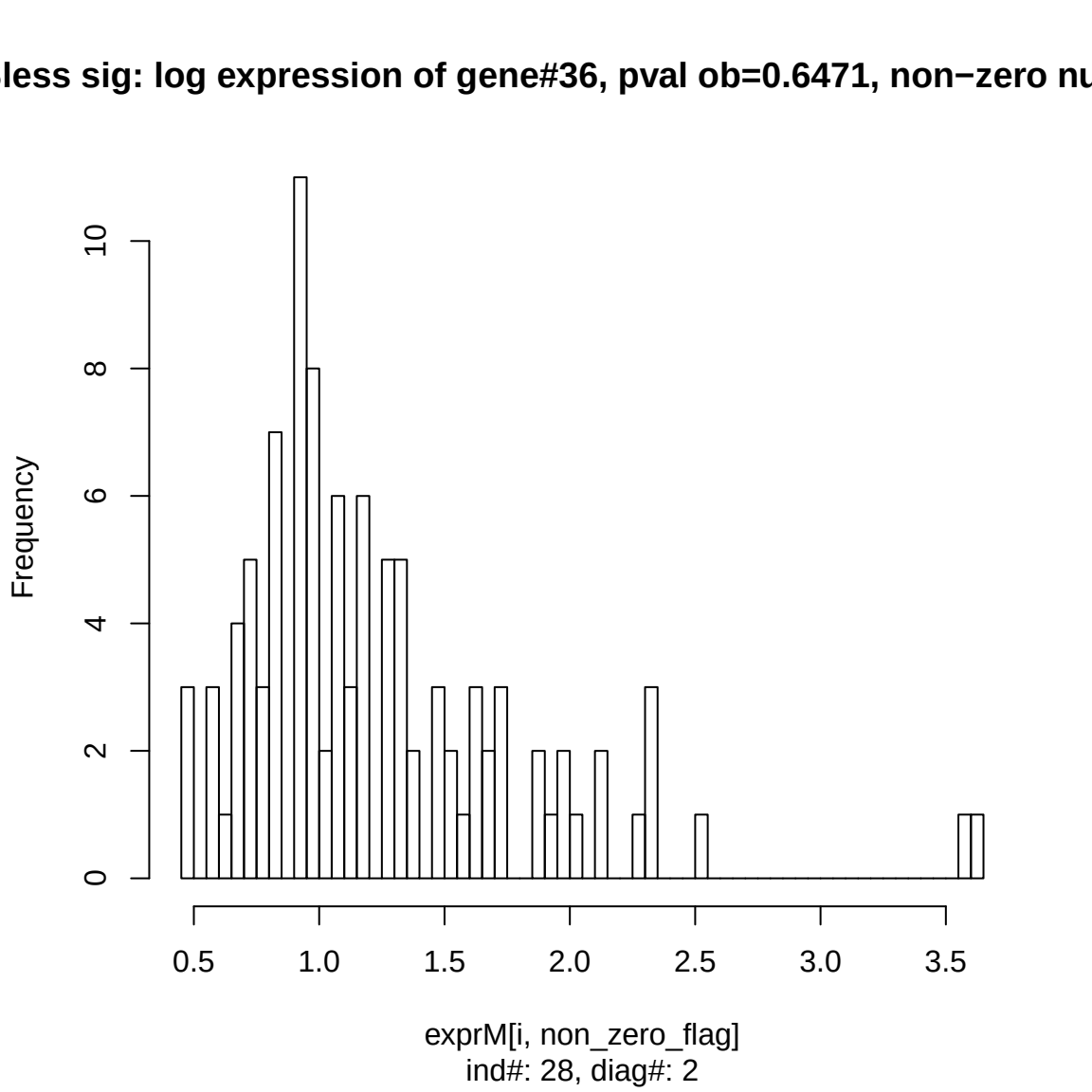

max of nozero log−expres of genes,ks no sig
Frequency
0
20
40
60
80
100
120
1
2
3
4
5
6
exprM_nozero_max[ks_nonsig]

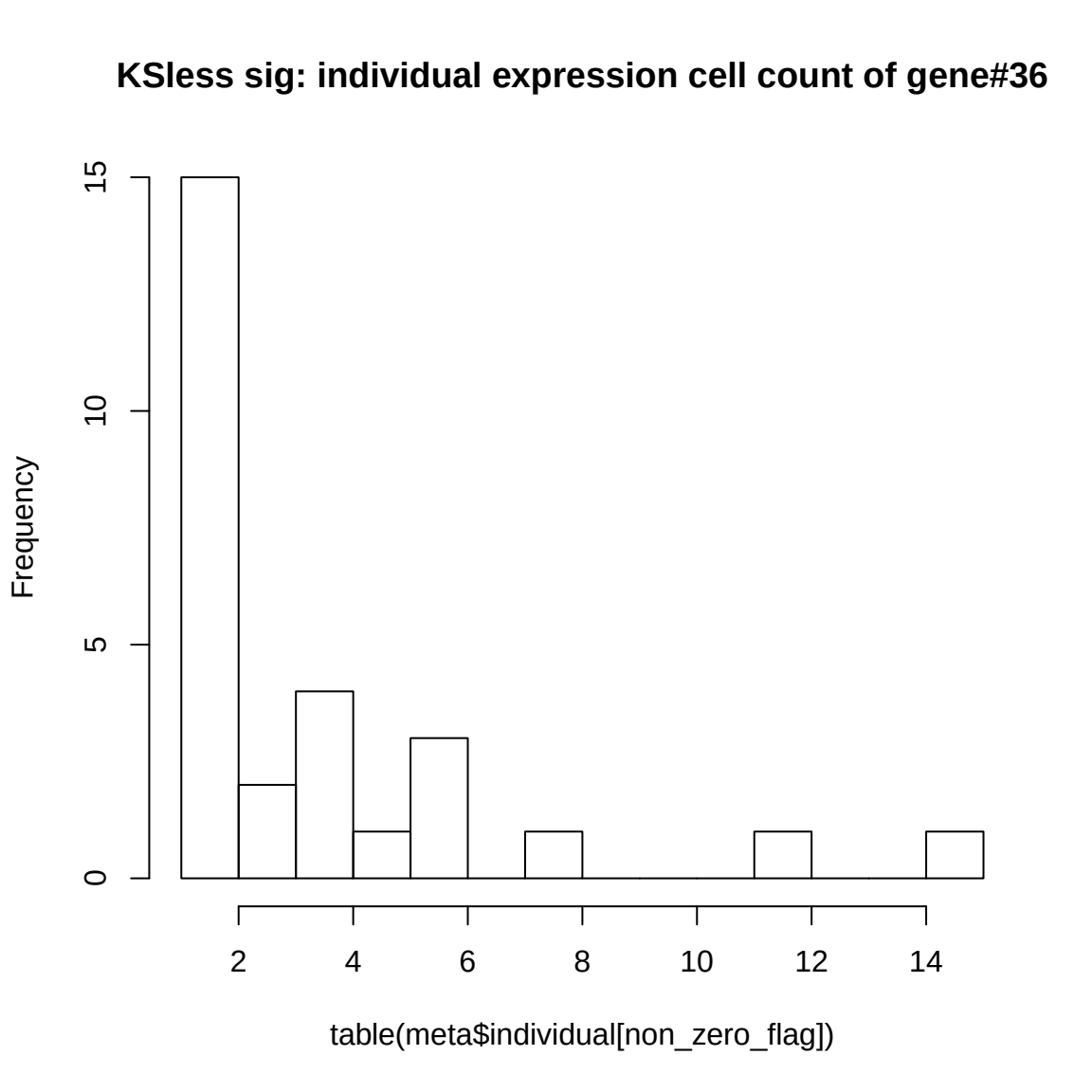

Sless sig: log expression of gene#15, pval ob=0.8282, non−zero nu
Frequency
0
2
4
6
8
0.5
1.0
1.5
2.0
2.5
3.0
exprM[i, non_zero_flag]
ind#: 24, diag#: 2

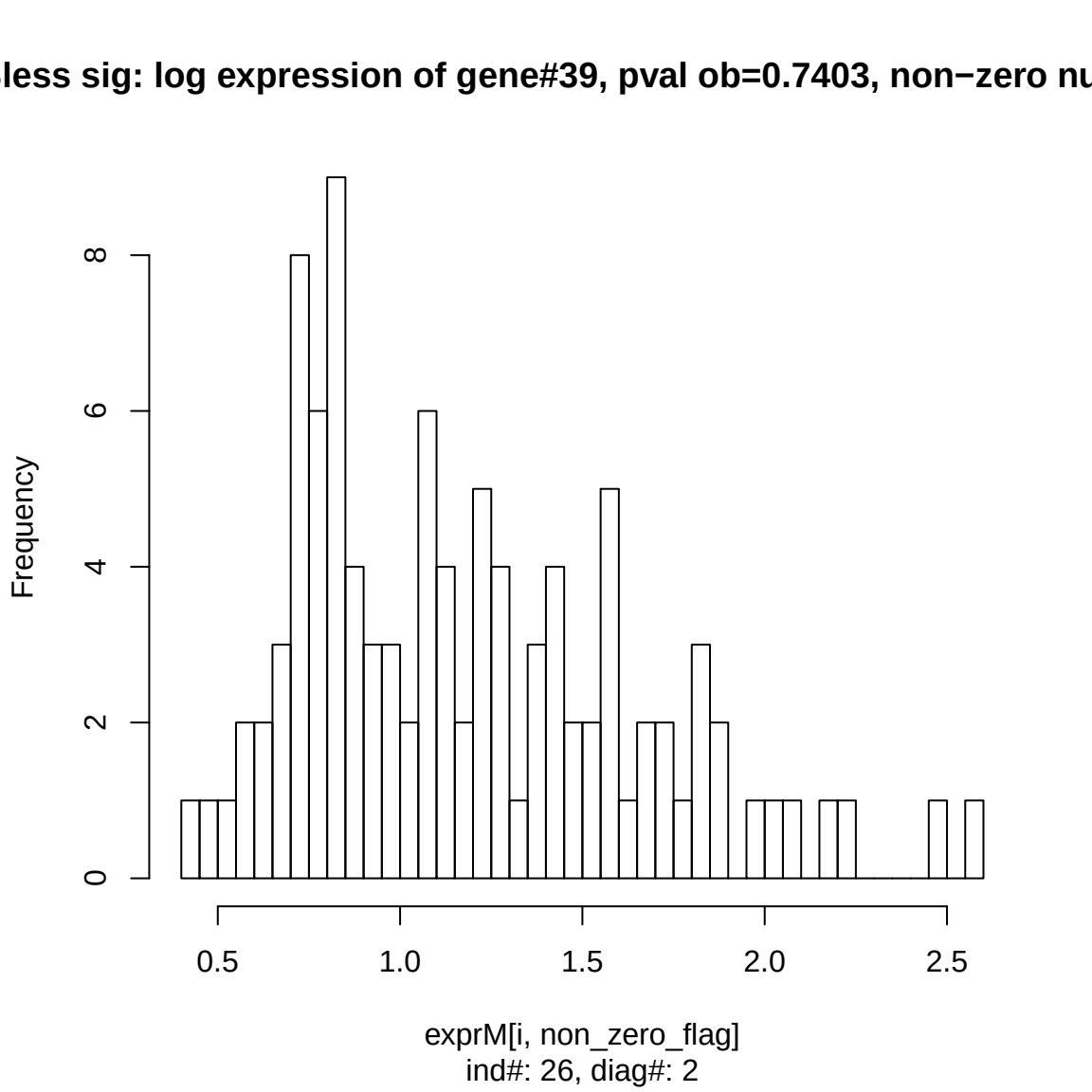

KSless sig: individual expression cell count of gene#15
Frequency
0
2
4
6
8
1
2
3
4
5
6
7
table(meta$individual[non_zero_flag])

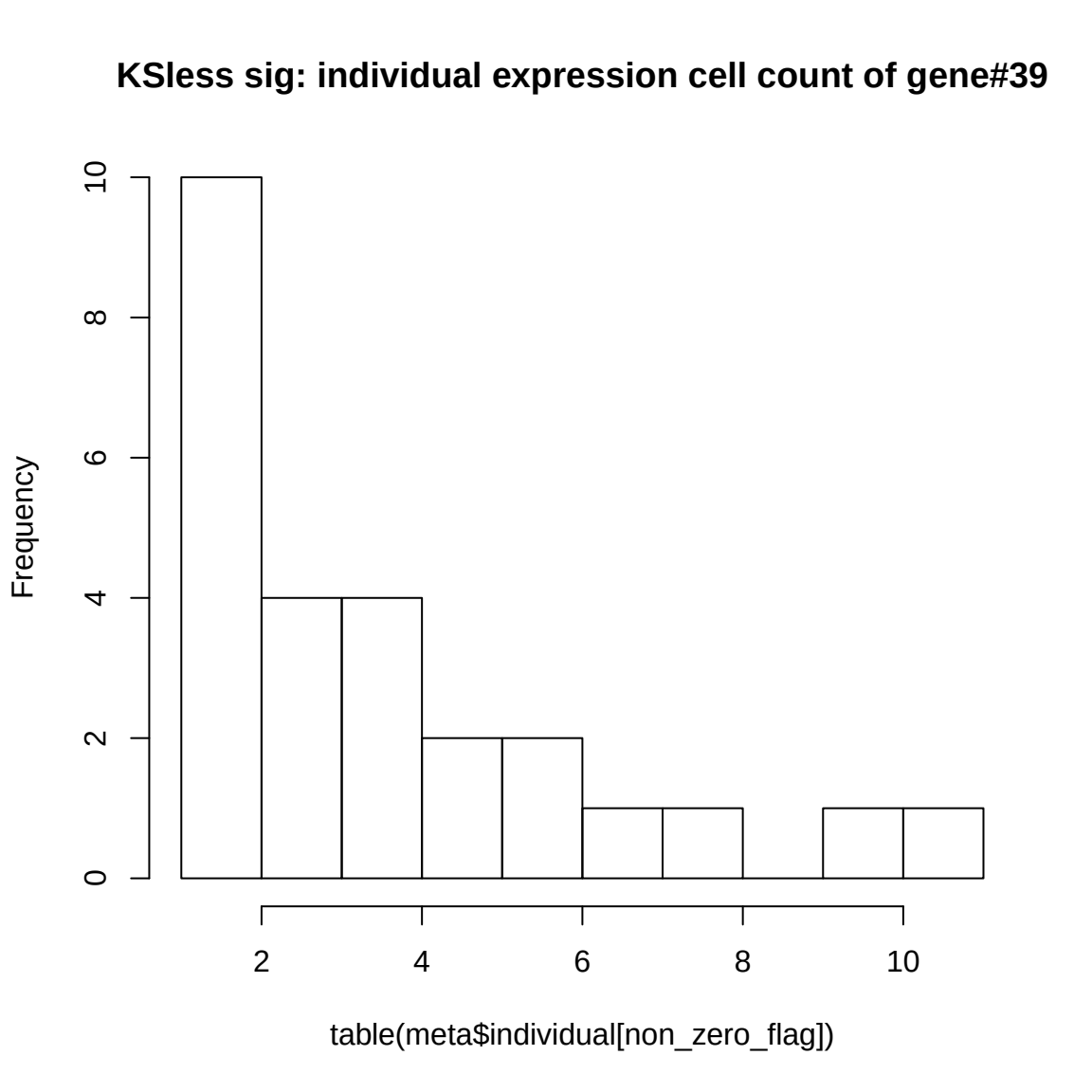

Sless sig: log expression of gene#27, pval ob=0.0691, non−zero nu
Frequency
0
1
2
3
4
0.5
1.0
1.5
2.0
exprM[i, non_zero_flag]
ind#: 20, diag#: 2

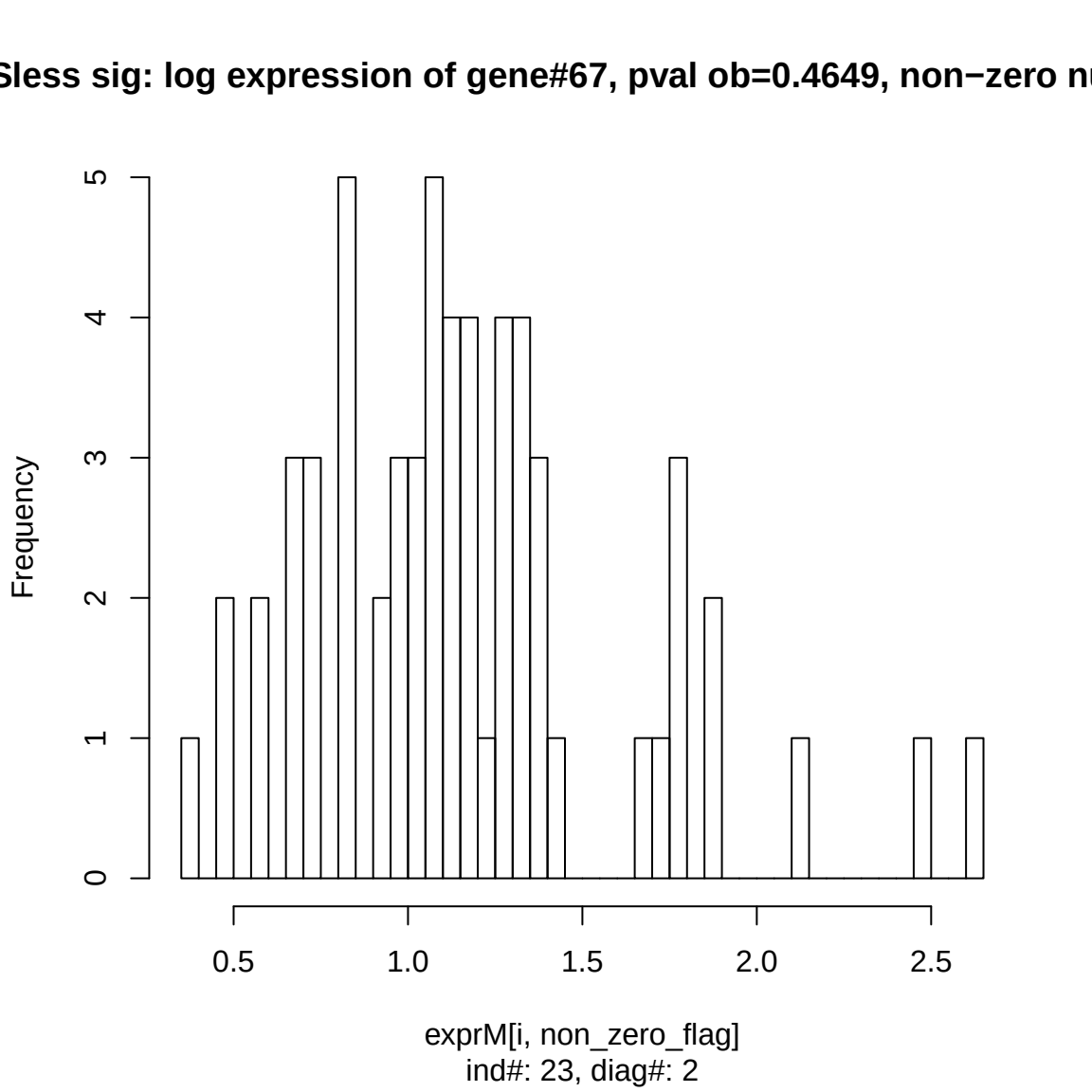

KSless sig: individual expression cell count of gene#27
Frequency
0
1
2
3
4
5
6
1
2
3
4
5
6
table(meta$individual[non_zero_flag])

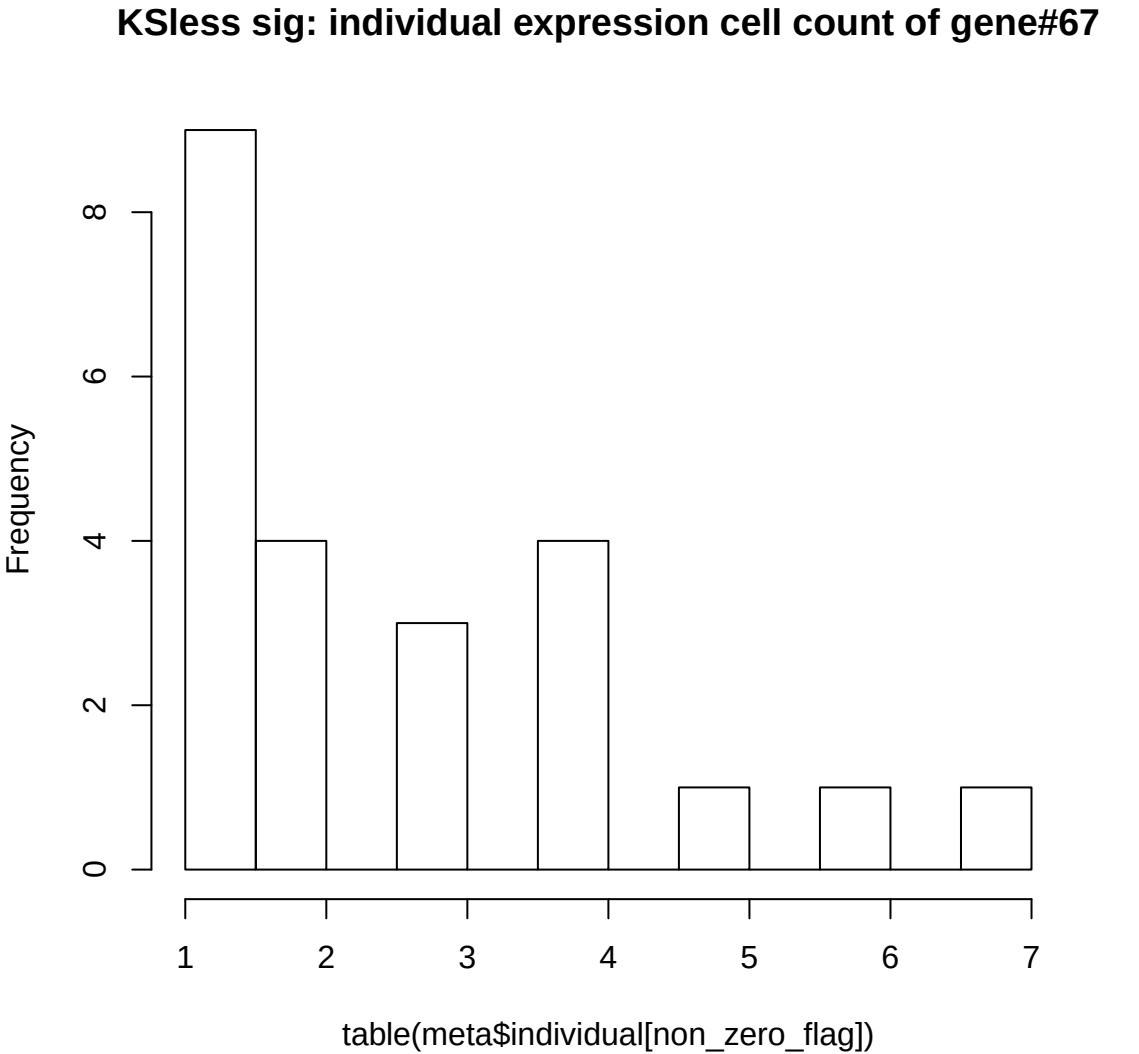

less sig: log expression of gene#36, pval ob=0.6471, non−zero nu
Frequency
0
2
4
6
8
10
0.5
1.0
1.5
2.0
2.5
3.0
3.5
exprM[i, non_zero_flag]
ind#: 28, diag#: 2

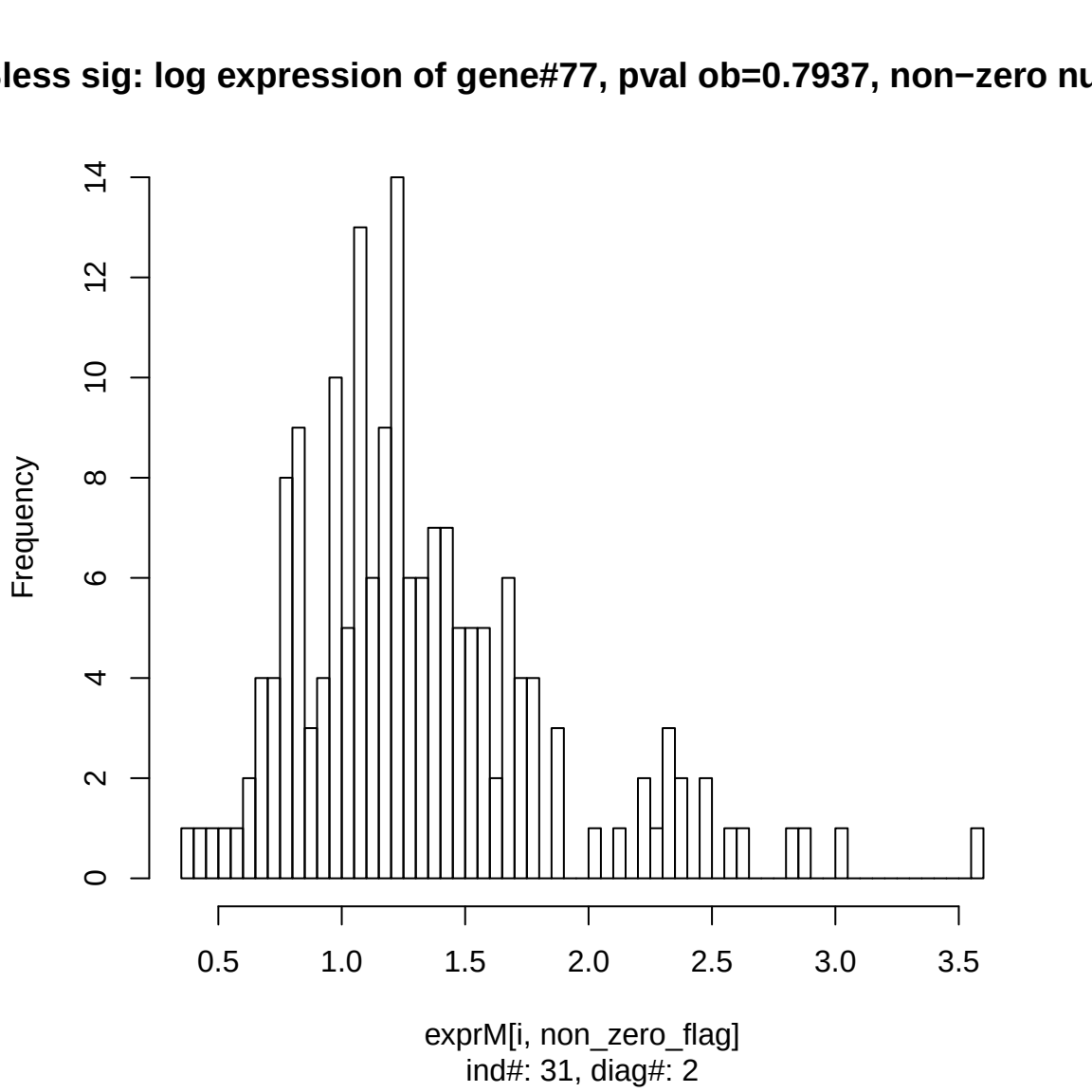

KSless sig: individual expression cell count of gene#36
Frequency
0
5
10
15
2
4
6
8
10
12
14
table(meta$individual[non_zero_flag])

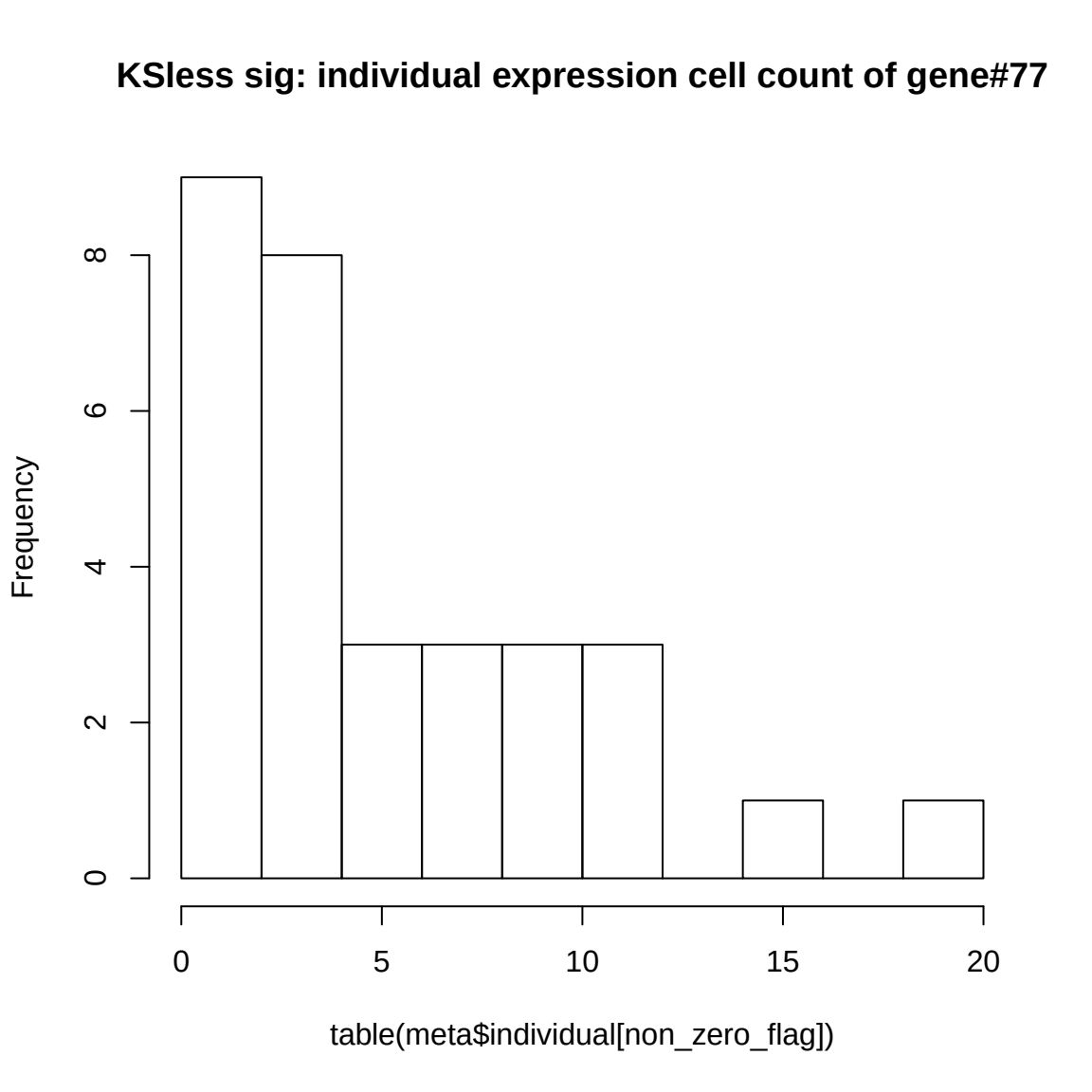

less sig: log expression of gene#39, pval ob=0.7403, non−zero nu
Frequency
0
2
4
6
8
0.5
1.0
1.5
2.0
2.5
exprM[i, non_zero_flag]
ind#: 26, diag#: 2


KSless sig: individual expression cell count of gene#39
Frequency
0
2
4
6
8
10
2
4
6
8
10
table(meta$individual[non_zero_flag])

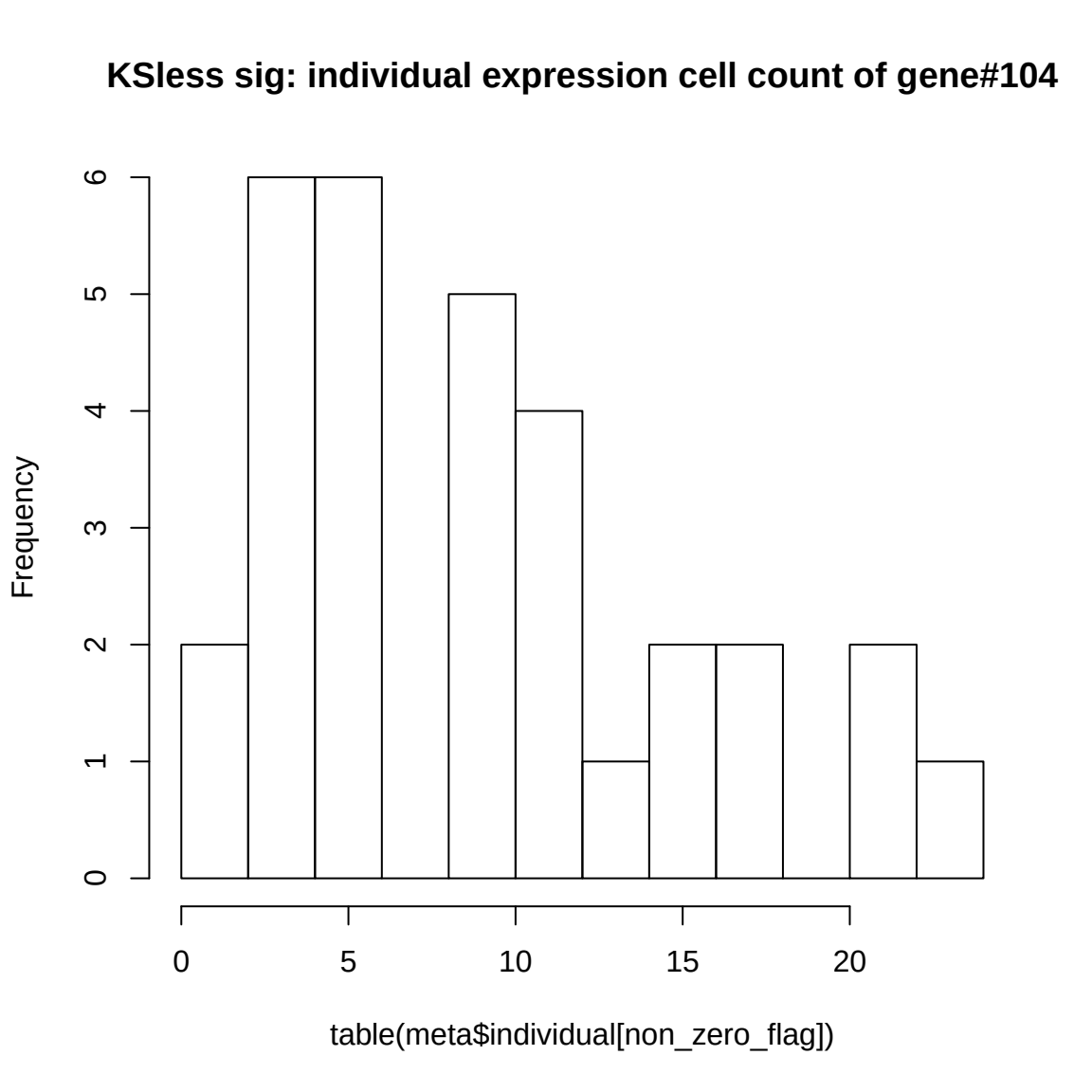

Sless sig: log expression of gene#67, pval ob=0.4649, non−zero nu
Frequency
0
1
2
3
4
5
0.5
1.0
1.5
2.0
2.5
exprM[i, non_zero_flag]
ind#: 23, diag#: 2

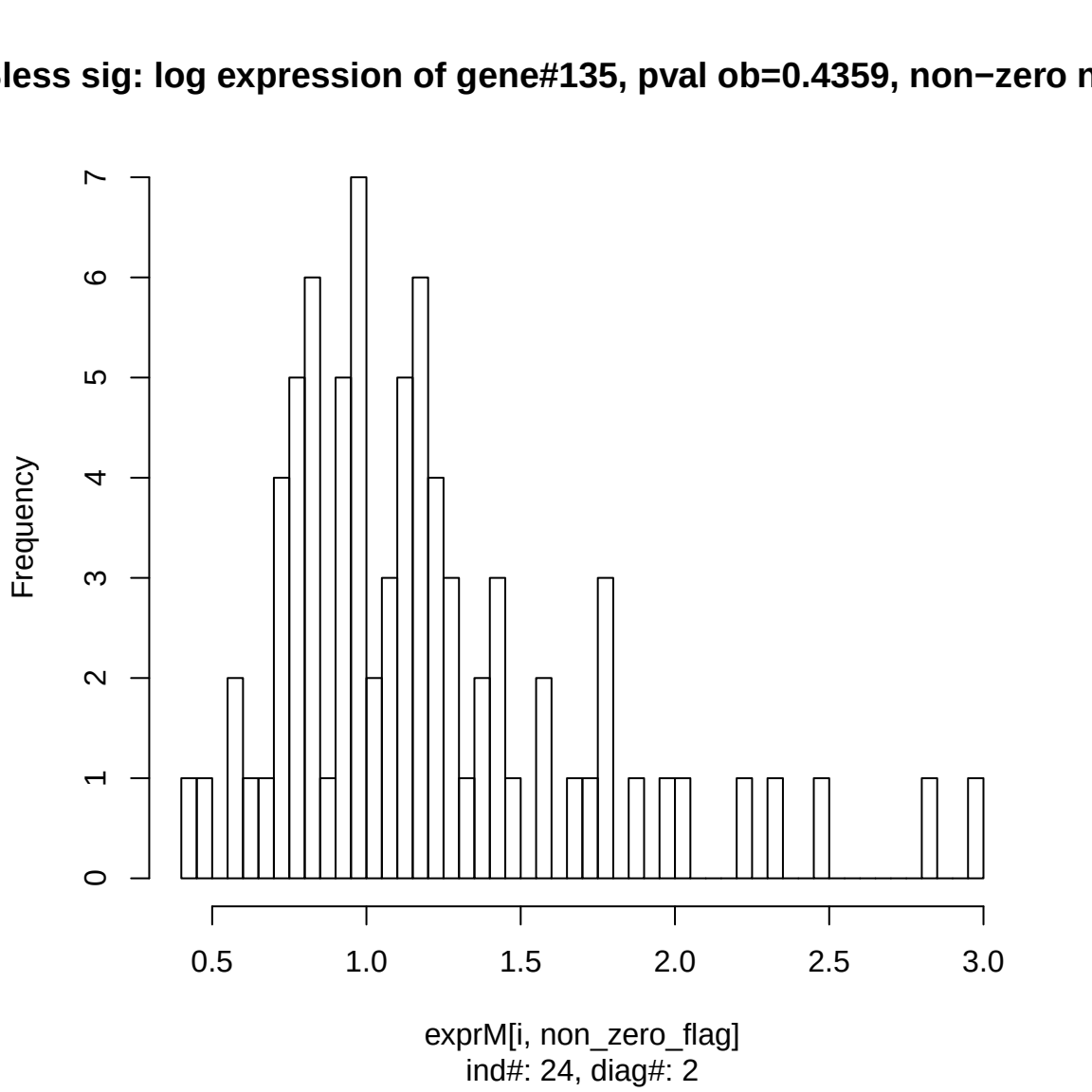

KSless sig: individual expression cell count of gene#67
Frequency
0
2
4
6
8
1
2
3
4
5
6
7
table(meta$individual[non_zero_flag])

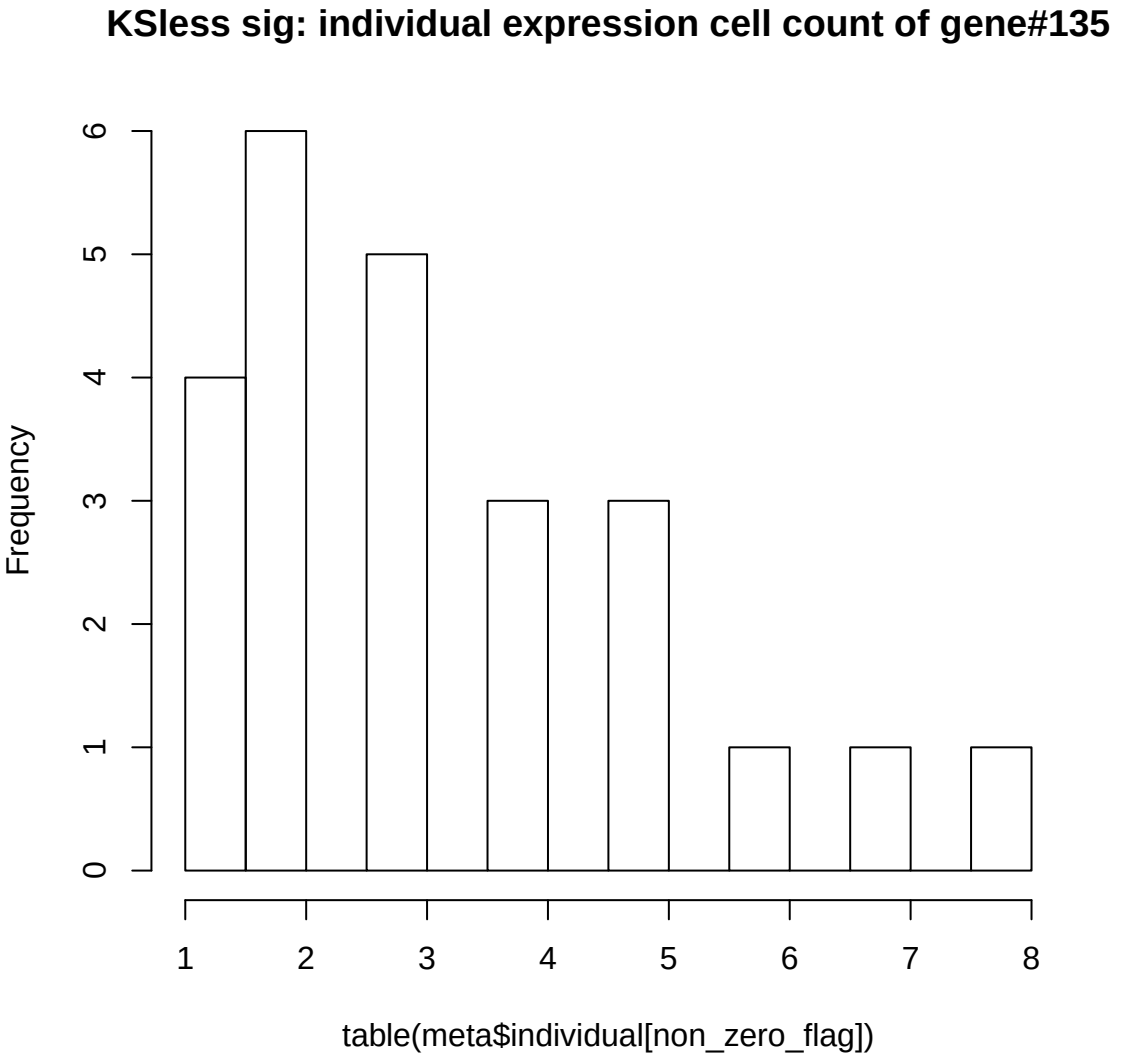

less sig: log expression of gene#77, pval ob=0.7937, non−zero nu
Frequency
0
2
4
6
8
10
12
14
0.5
1.0
1.5
2.0
2.5
3.0
3.5
exprM[i, non_zero_flag]
ind#: 31, diag#: 2

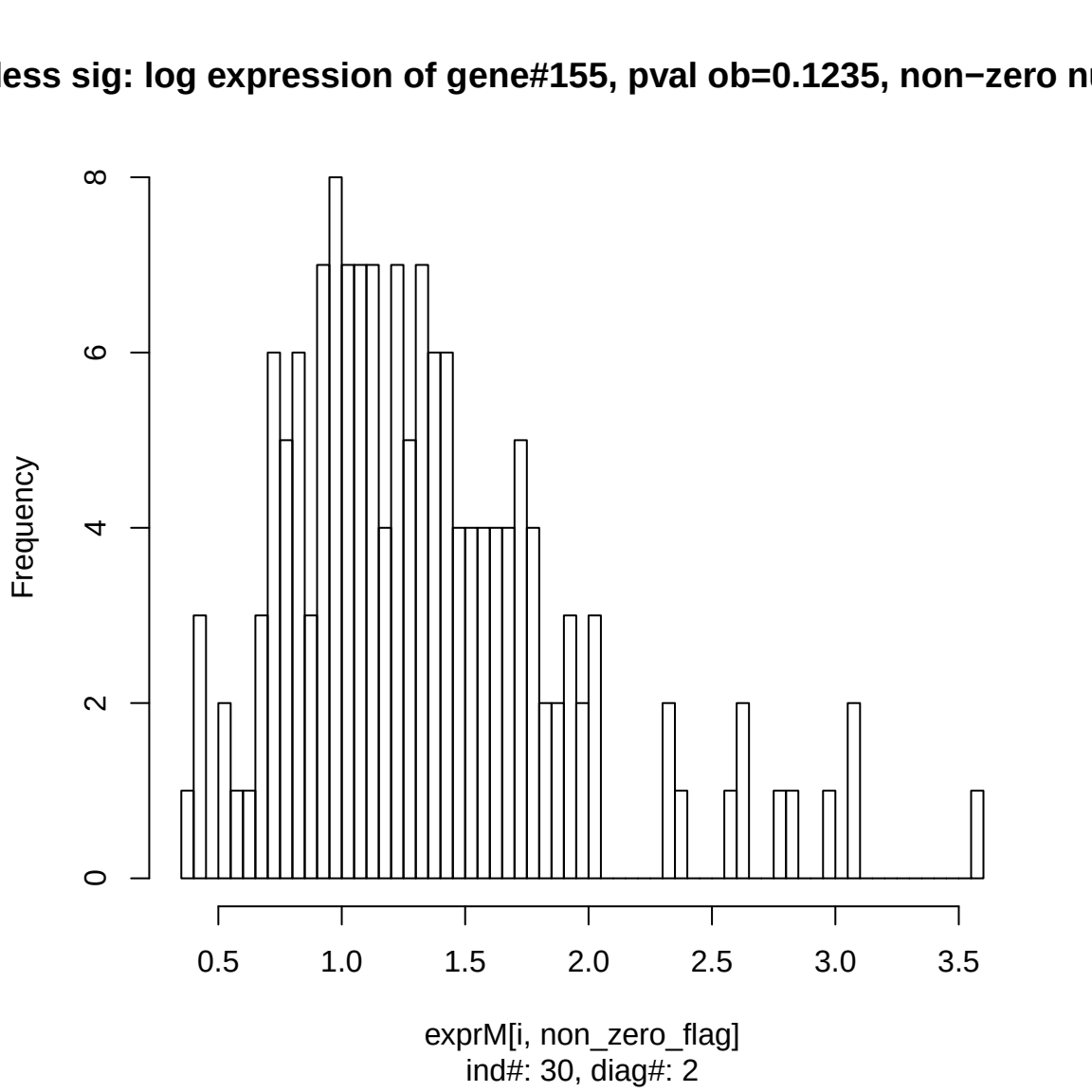

KSless sig: individual expression cell count of gene#77
Frequency
0
2
4
6
8
0
5
10
15
20
table(meta$individual[non_zero_flag])

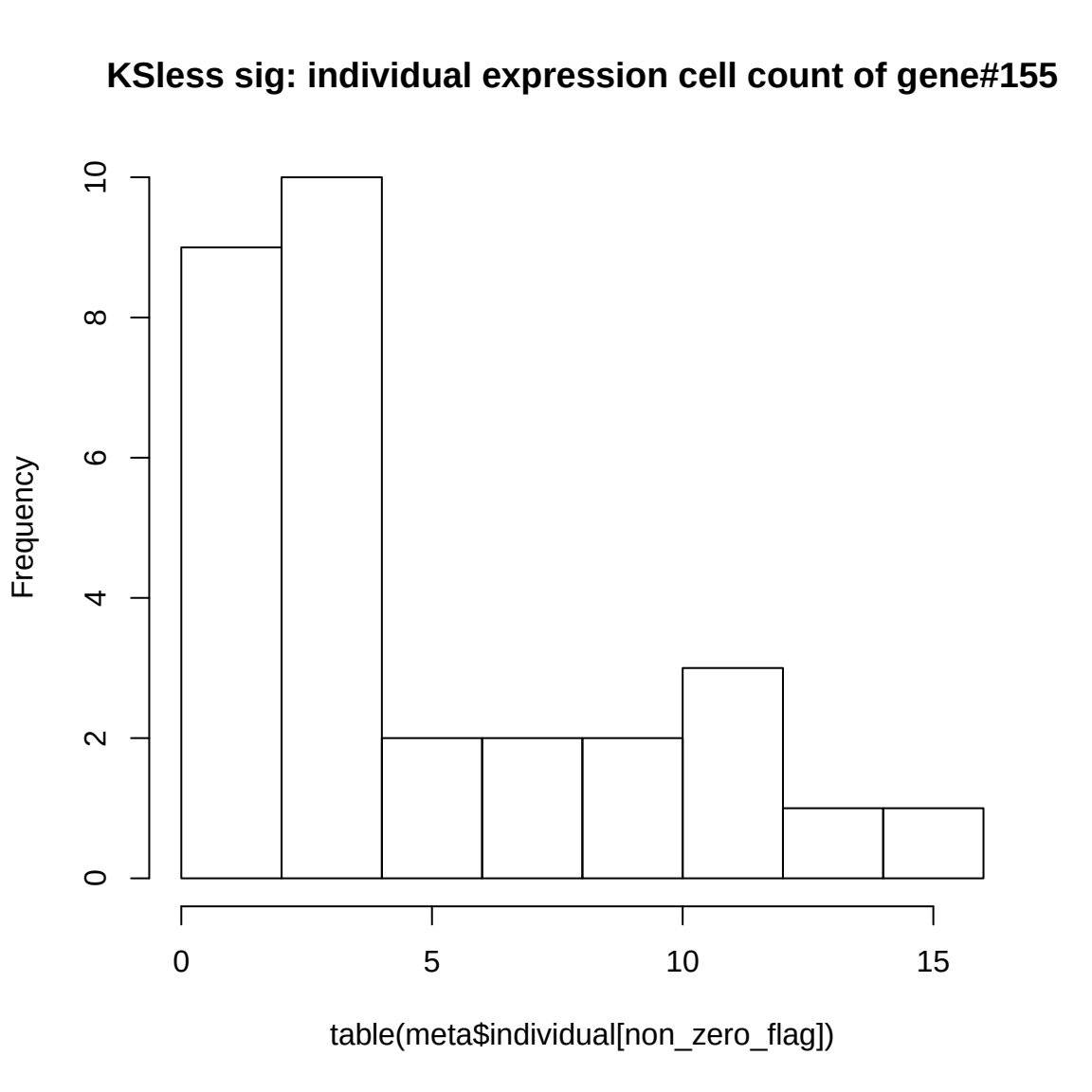
less sig: log expression of gene#104, pval ob=0.1902, non−zero nu
Frequency
0
5
10
15
20
1
2
3
4
5
exprM[i, non_zero_flag]
ind#: 31, diag#: 2

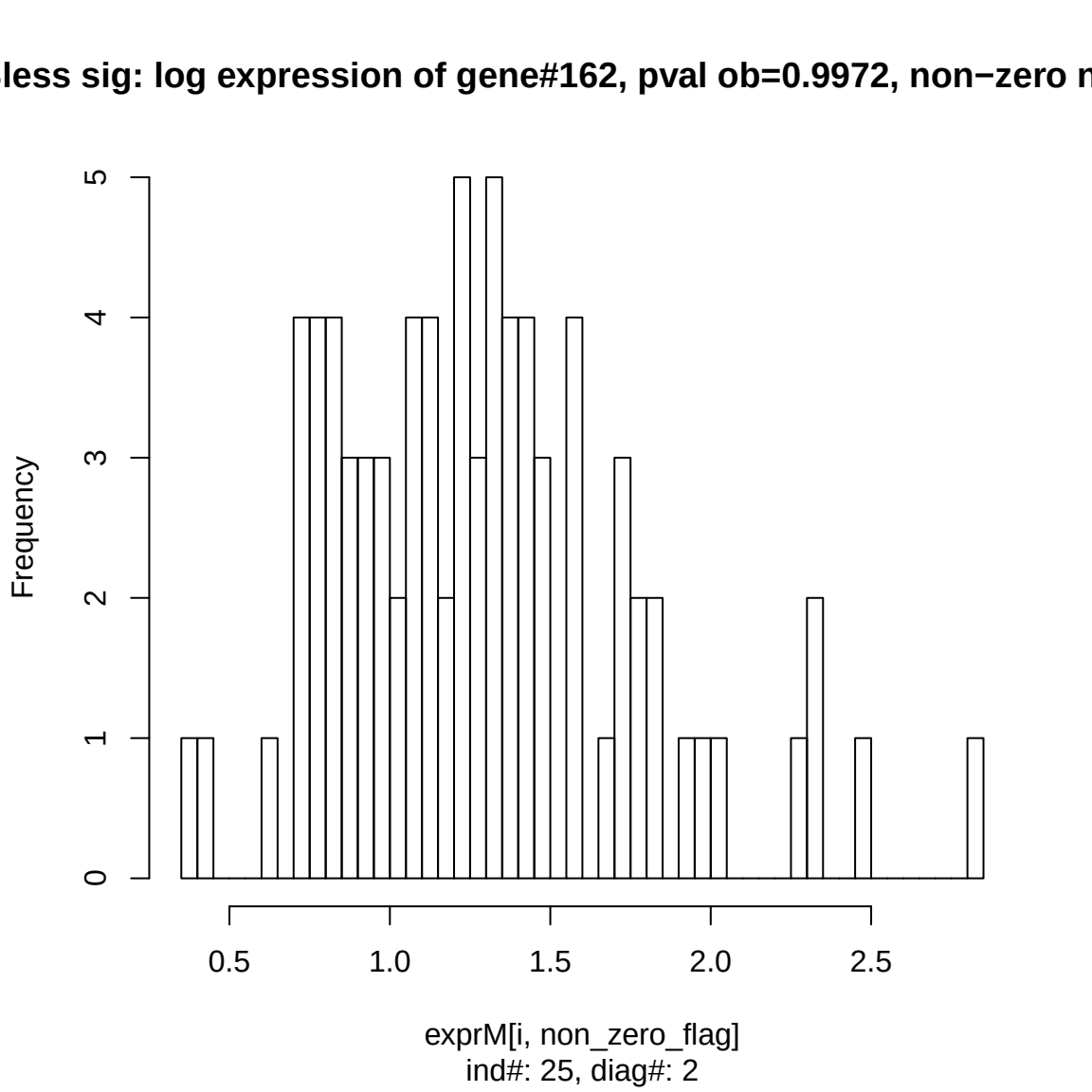

KSless sig: individual expression cell count of gene#104
Frequency
0
1
2
3
4
5
6
0
5
10
15
20
table(meta$individual[non_zero_flag])

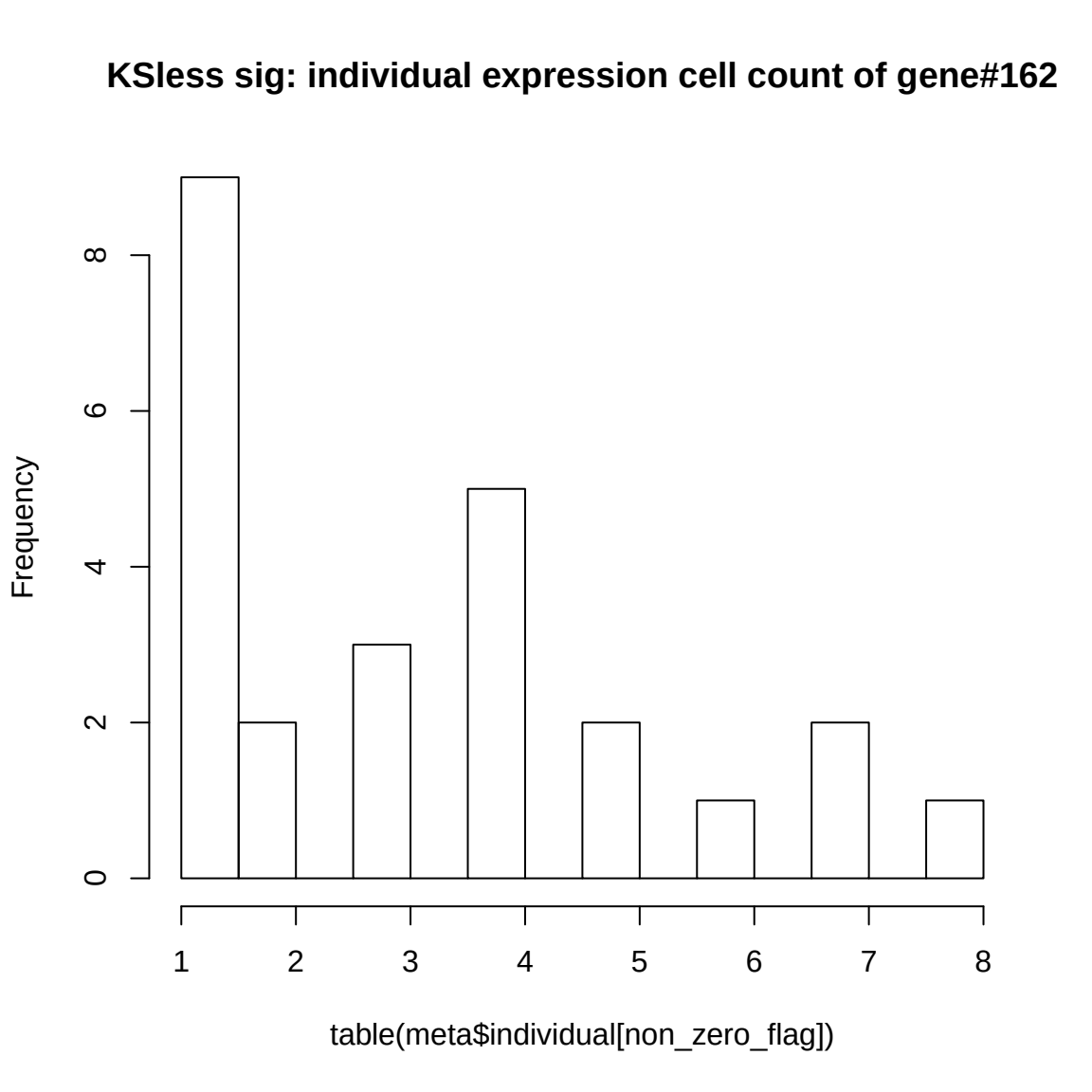

less sig: log expression of gene#135, pval ob=0.4359, non−zero n
Frequency
0
1
2
3
4
5
6
7
0.5
1.0
1.5
2.0
2.5
3.0
exprM[i, non_zero_flag]
ind#: 24, diag#: 2

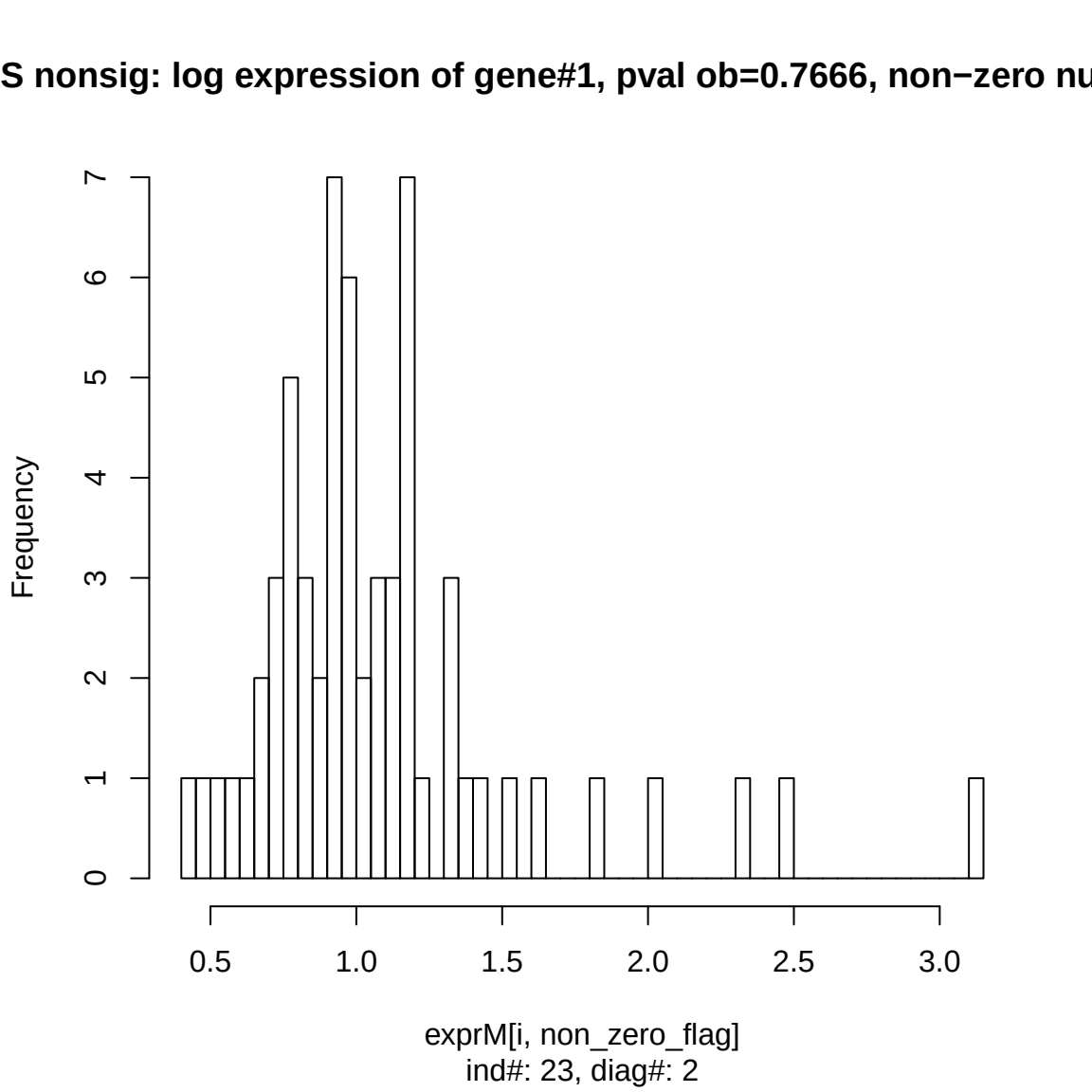

KSless sig: individual expression cell count of gene#135
Frequency
0
1
2
3
4
5
6
1
2
3
4
5
6
7
8
table(meta$individual[non_zero_flag])

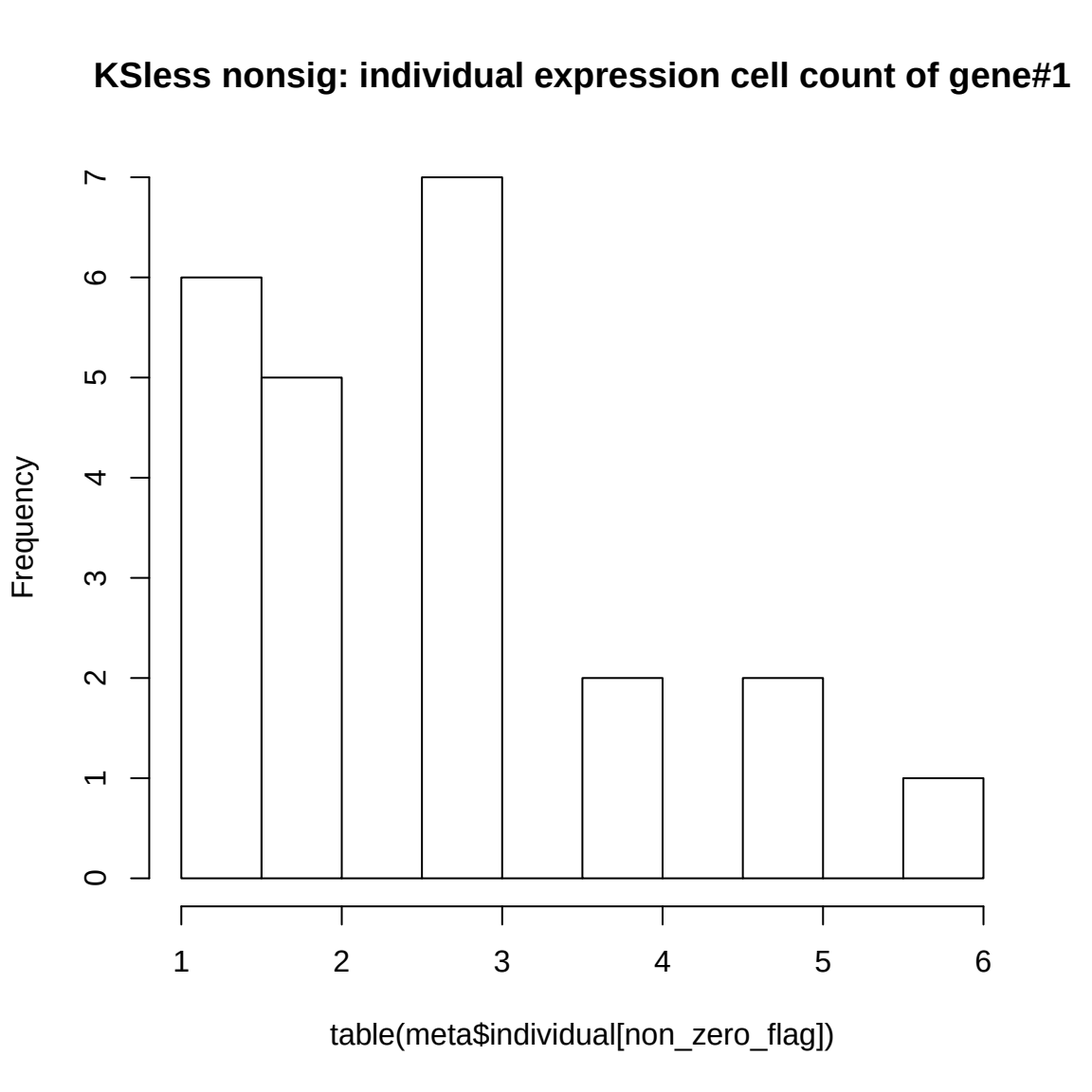

less sig: log expression of gene#155, pval ob=0.1235, non−zero nu
Frequency
0
2
4
6
8
0.5
1.0
1.5
2.0
2.5
3.0
3.5
exprM[i, non_zero_flag]
ind#: 30, diag#: 2

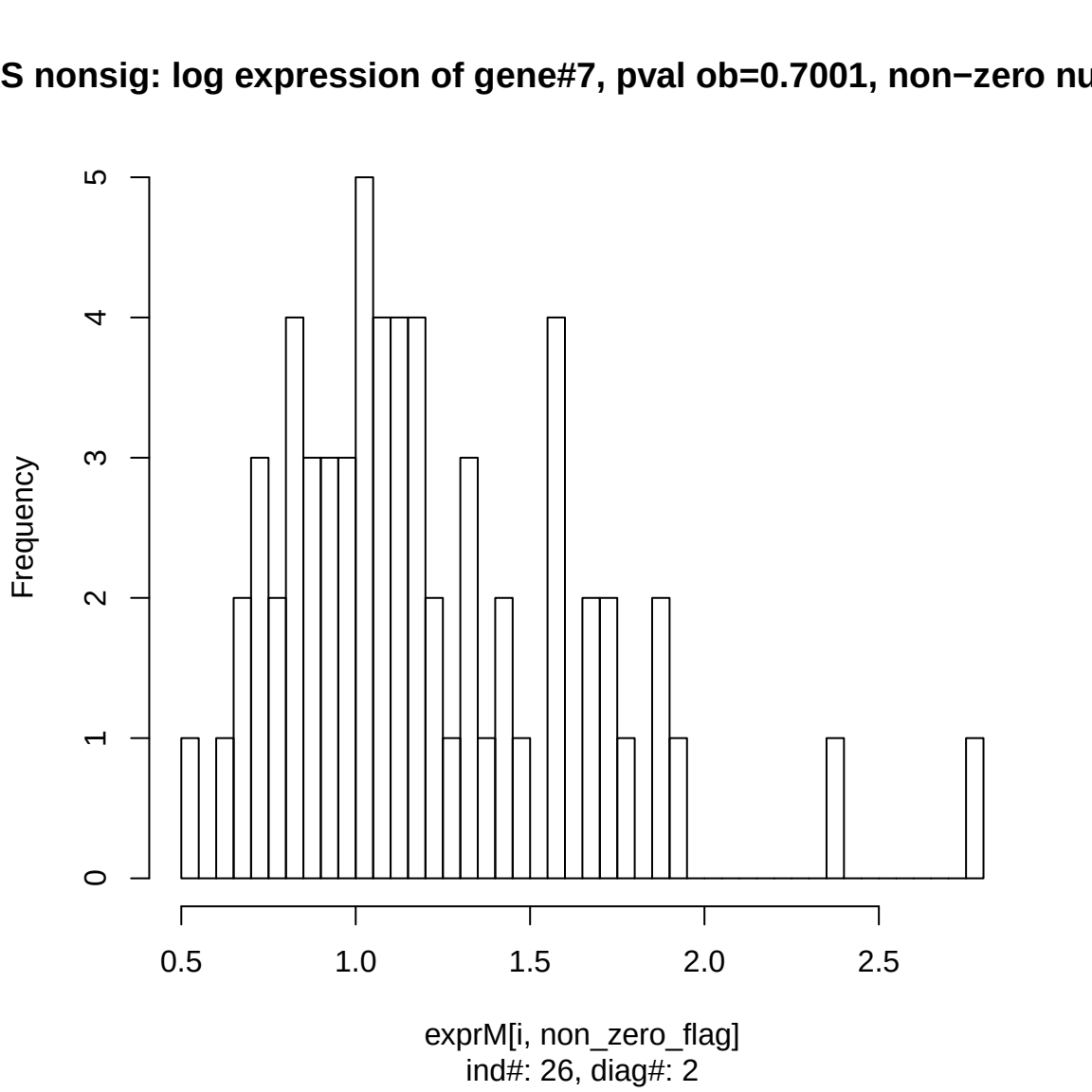

KSless sig: individual expression cell count of gene#155
Frequency
0
2
4
6
8
10
0
5
10
15
table(meta$individual[non_zero_flag])

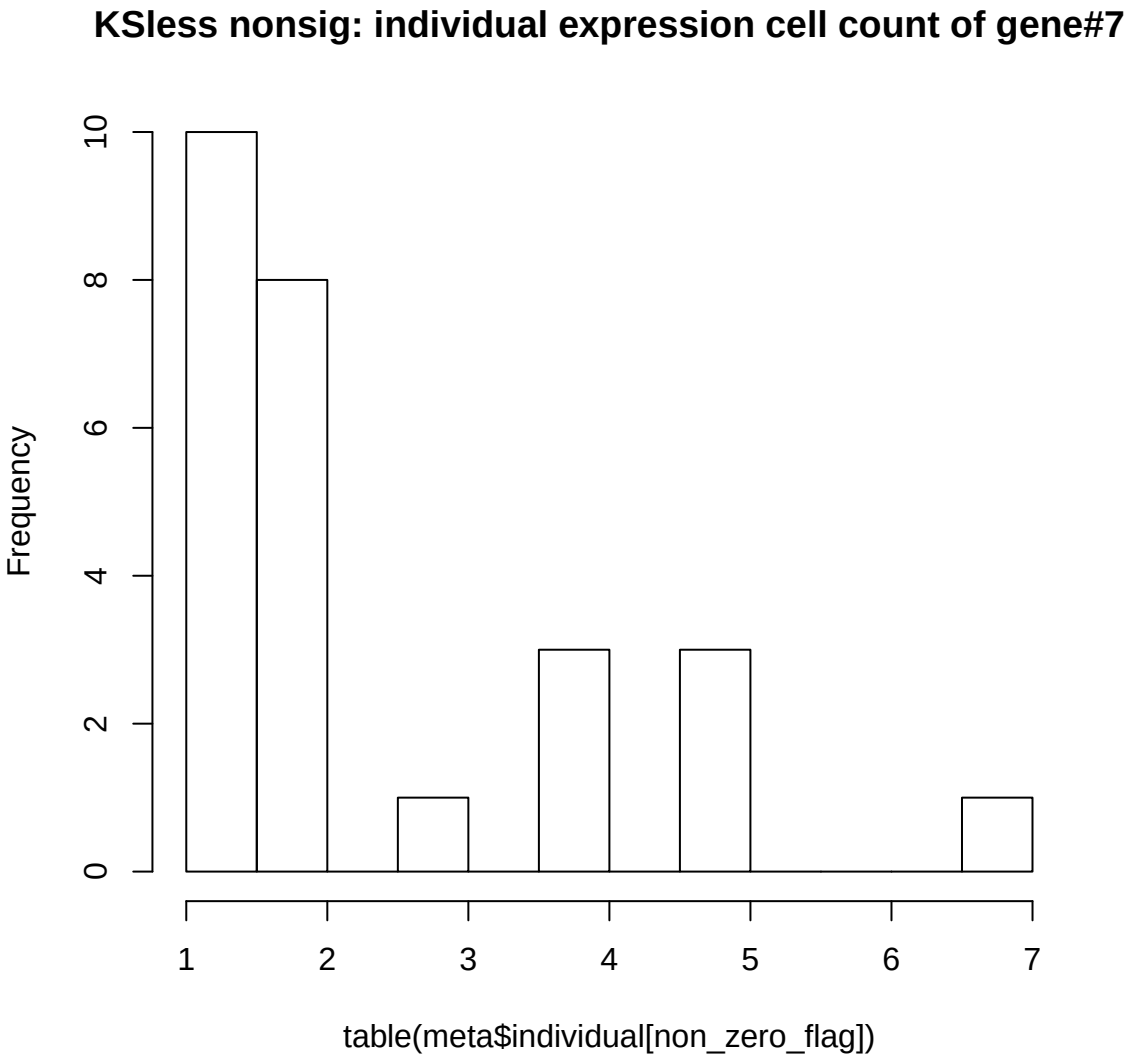

less sig: log expression of gene#162, pval ob=0.9972, non−zero n
Frequency
0
1
2
3
4
5
0.5
1.0
1.5
2.0
2.5
exprM[i, non_zero_flag]
ind#: 25, diag#: 2

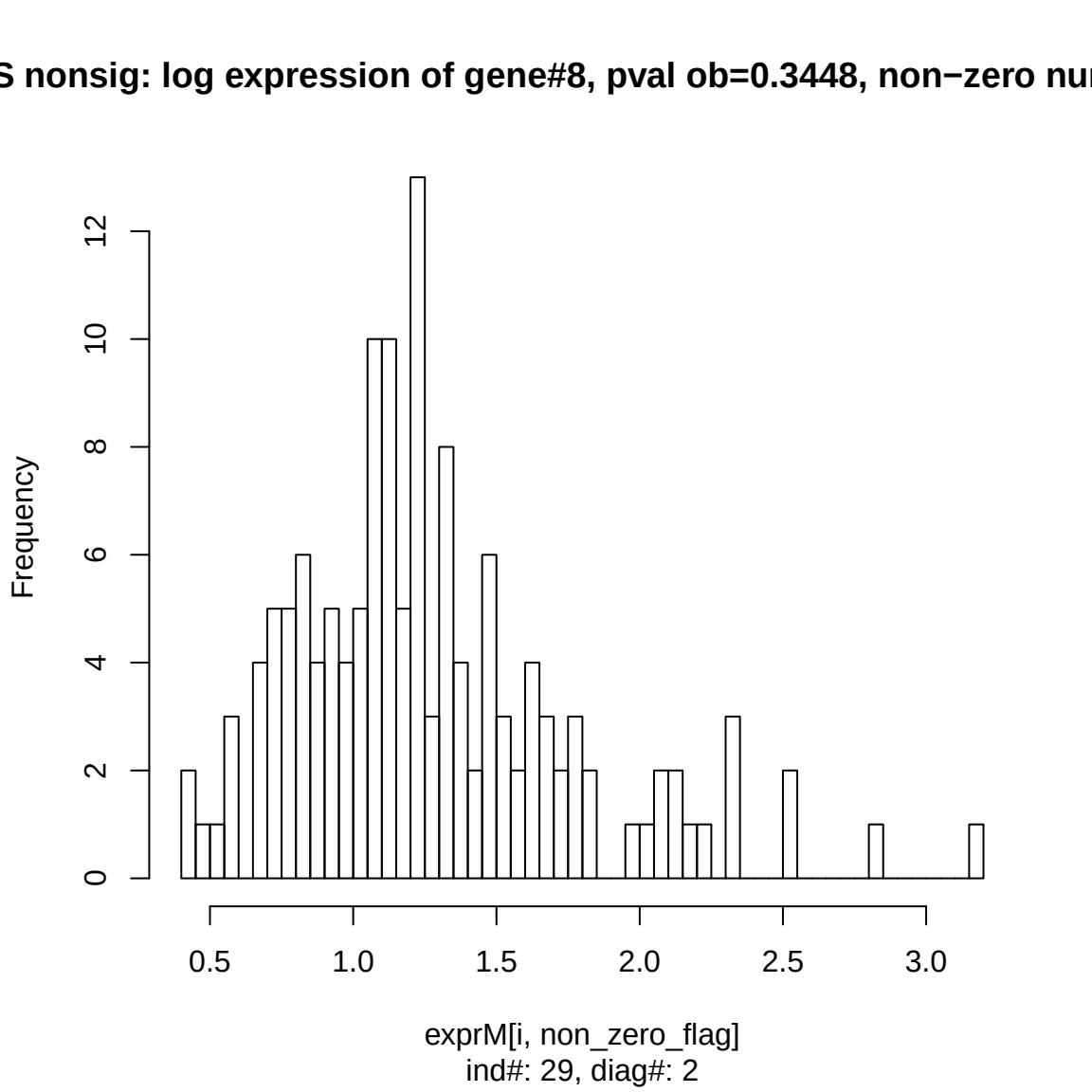

KSless sig: individual expression cell count of gene#162
Frequency
0
2
4
6
8
1
2
3
4
5
6
7
8
table(meta$individual[non_zero_flag])

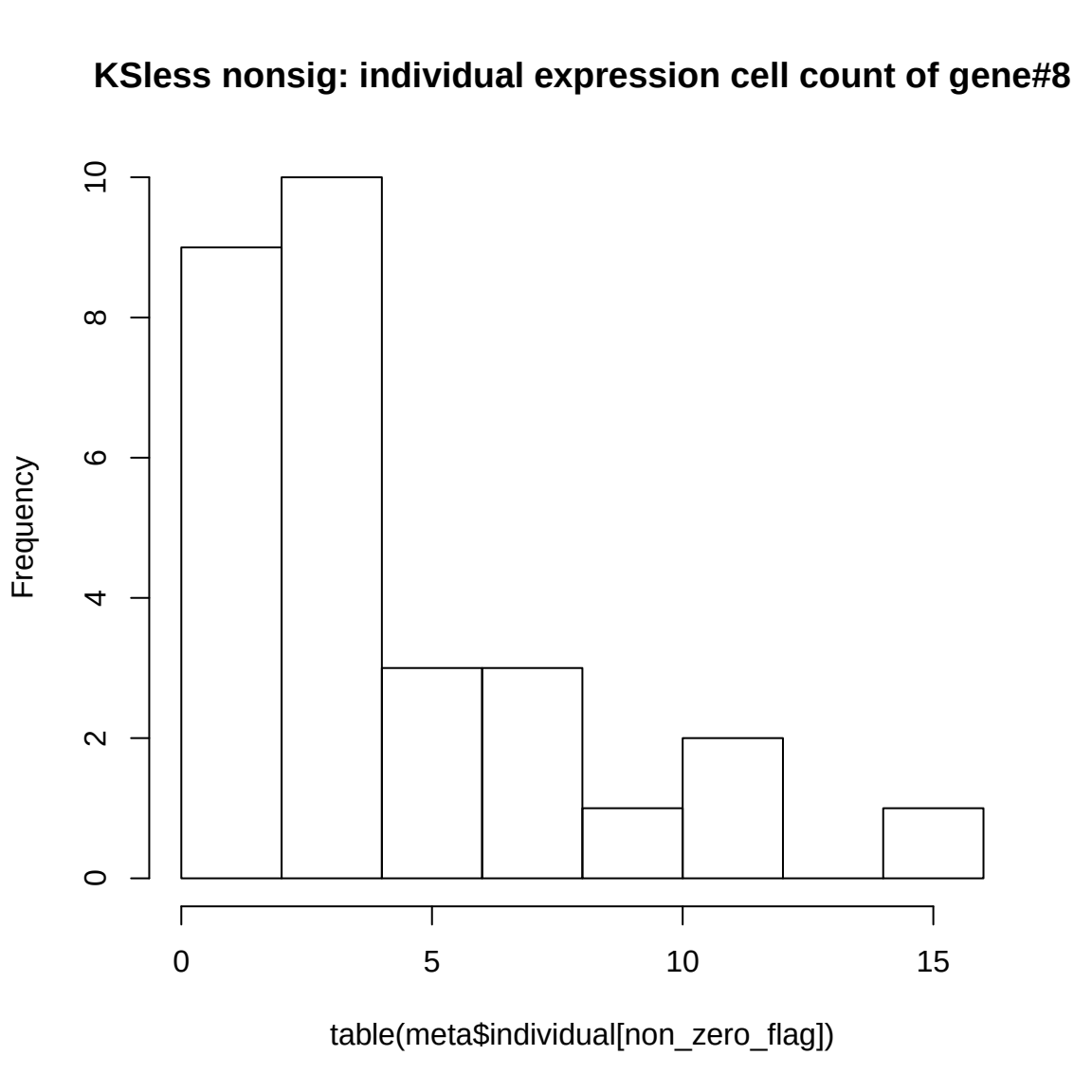

S nonsig: log expression of gene#1, pval ob=0.7666, non−zero nu
Frequency
0
1
2
3
4
5
6
7
0.5
1.0
1.5
2.0
2.5
3.0
exprM[i, non_zero_flag]
ind#: 23, diag#: 2

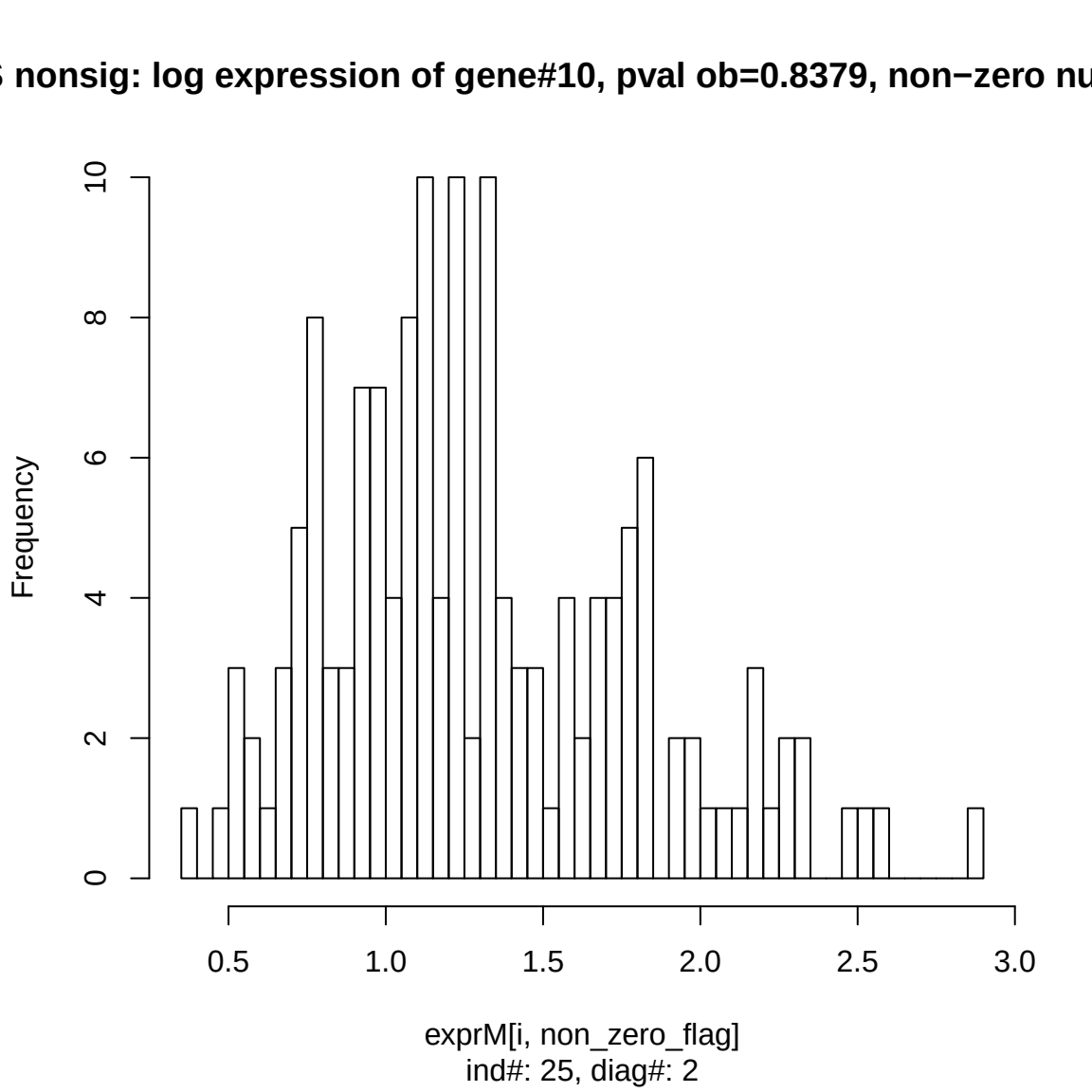

KSless nonsig: individual expression cell count of gene#1
Frequency
0
1
2
3
4
5
6
7
1
2
3
4
5
6
table(meta$individual[non_zero_flag])

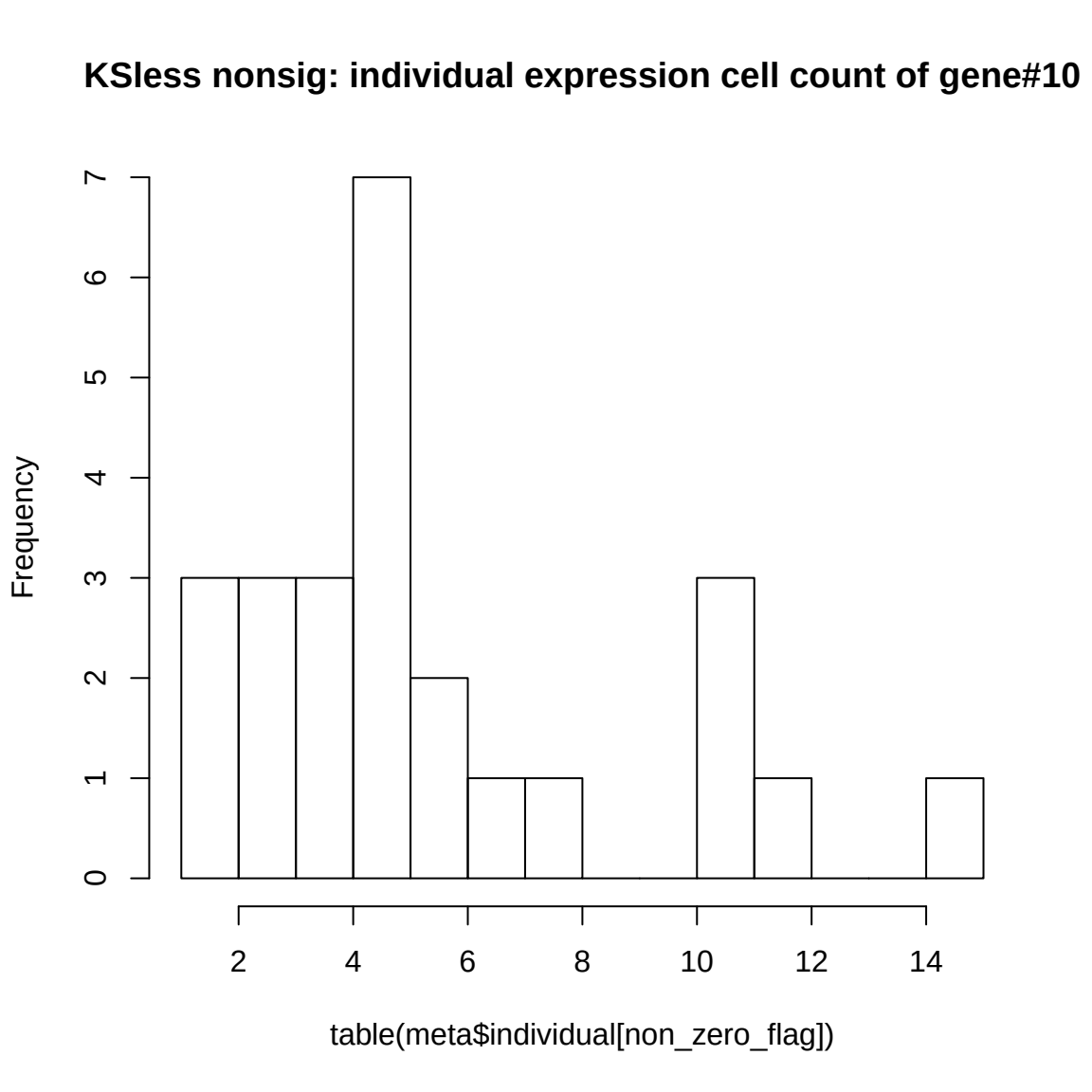

S nonsig: log expression of gene#7, pval ob=0.7001, non−zero nu
Frequency
0
1
2
3
4
5
0.5
1.0
1.5
2.0
2.5
exprM[i, non_zero_flag]
ind#: 26, diag#: 2

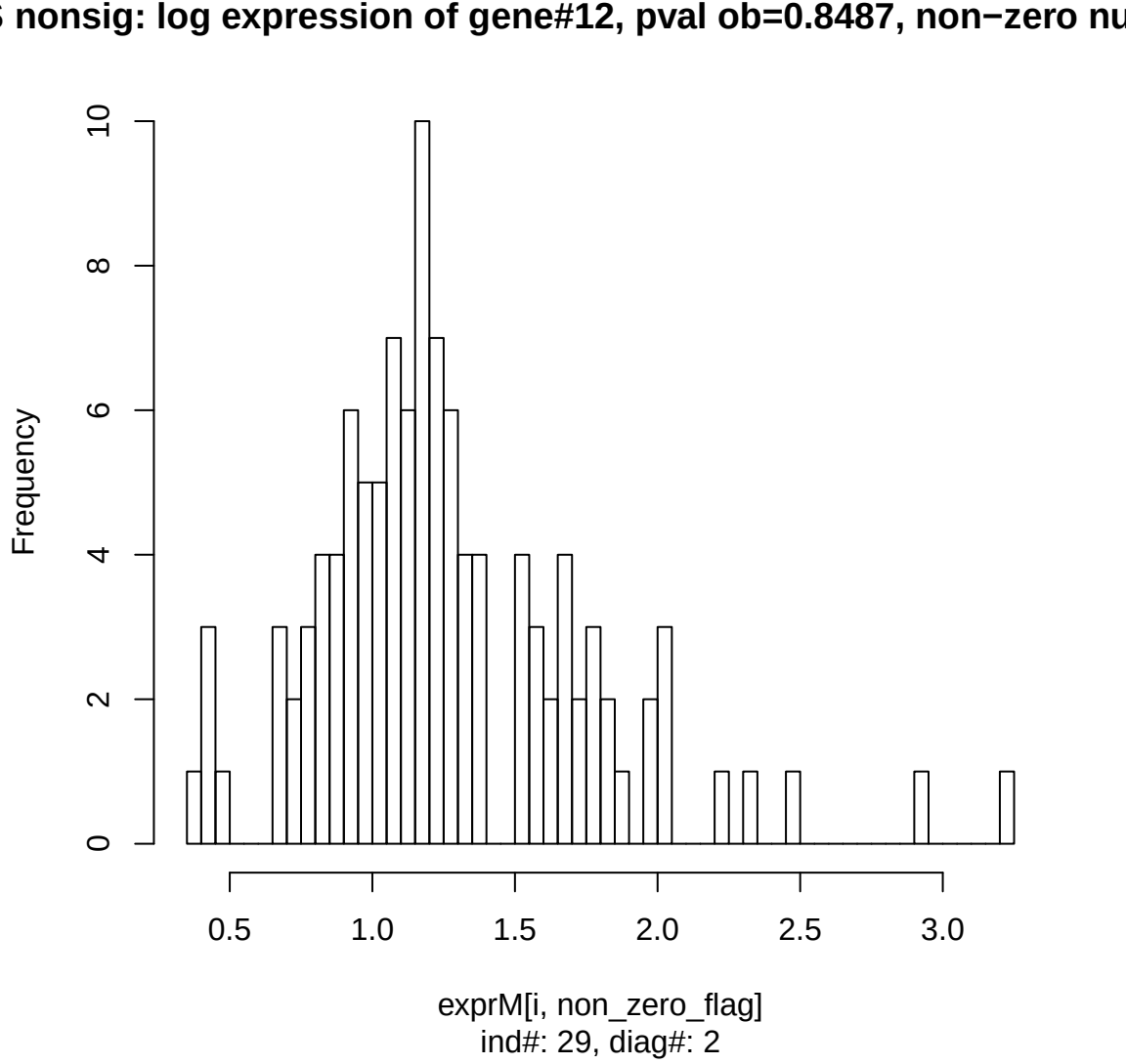

KSless nonsig: individual expression cell count of gene#7
Frequency
0
2
4
6
8
10
1
2
3
4
5
6
7
table(meta$individual[non_zero_flag])

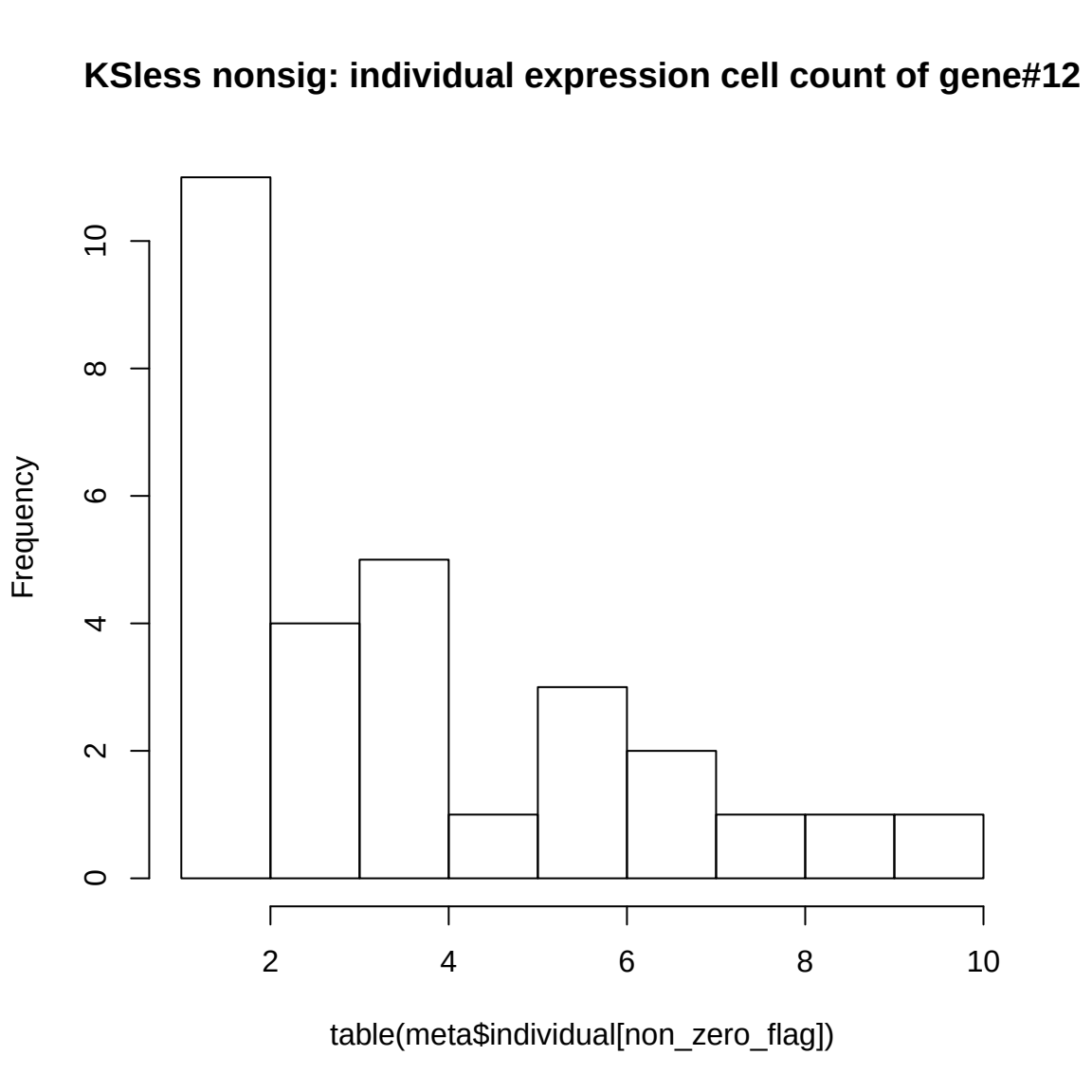

S nonsig: log expression of gene#8, pval ob=0.3448, non−zero nu
Frequency
0
2
4
6
8
10
12
0.5
1.0
1.5
2.0
2.5
3.0
exprM[i, non_zero_flag]
ind#: 29, diag#: 2

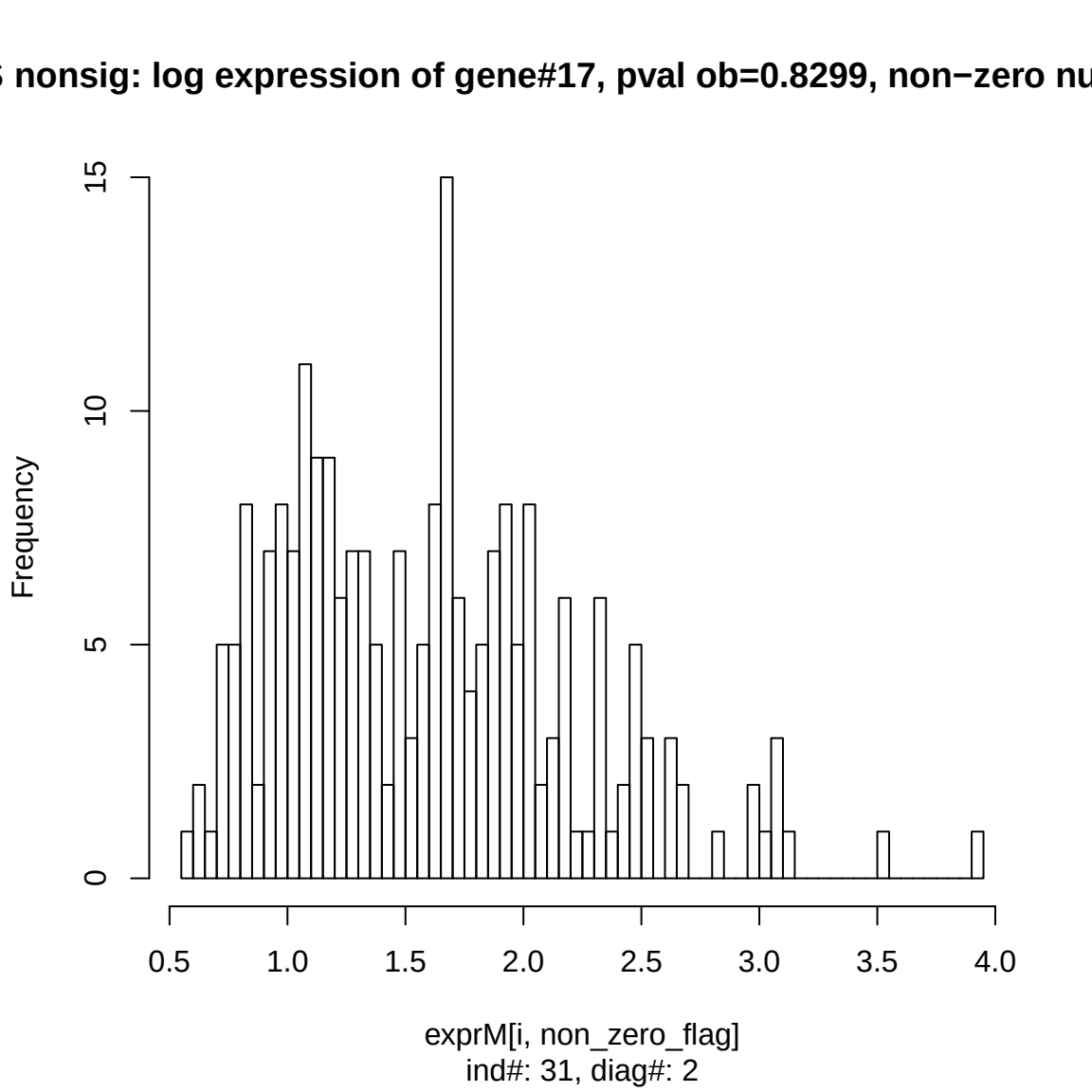

KSless nonsig: individual expression cell count of gene#8
Frequency
0
2
4
6
8
10
0
5
10
15
table(meta$individual[non_zero_flag])

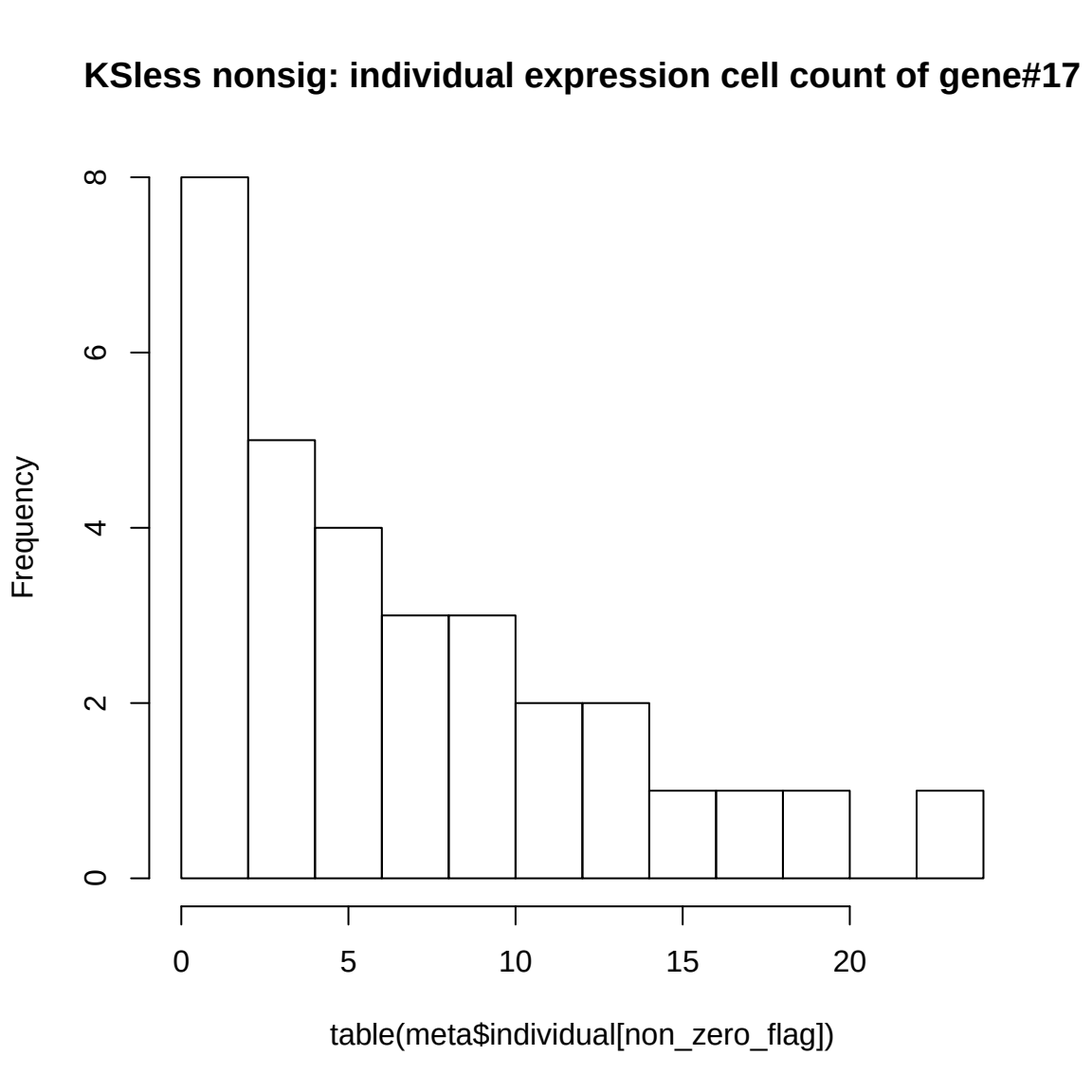

nonsig: log expression of gene#10, pval ob=0.8379, non−zero nu
Frequency
0
2
4
6
8
10
0.5
1.0
1.5
2.0
2.5
3.0
exprM[i, non_zero_flag]
ind#: 25, diag#: 2

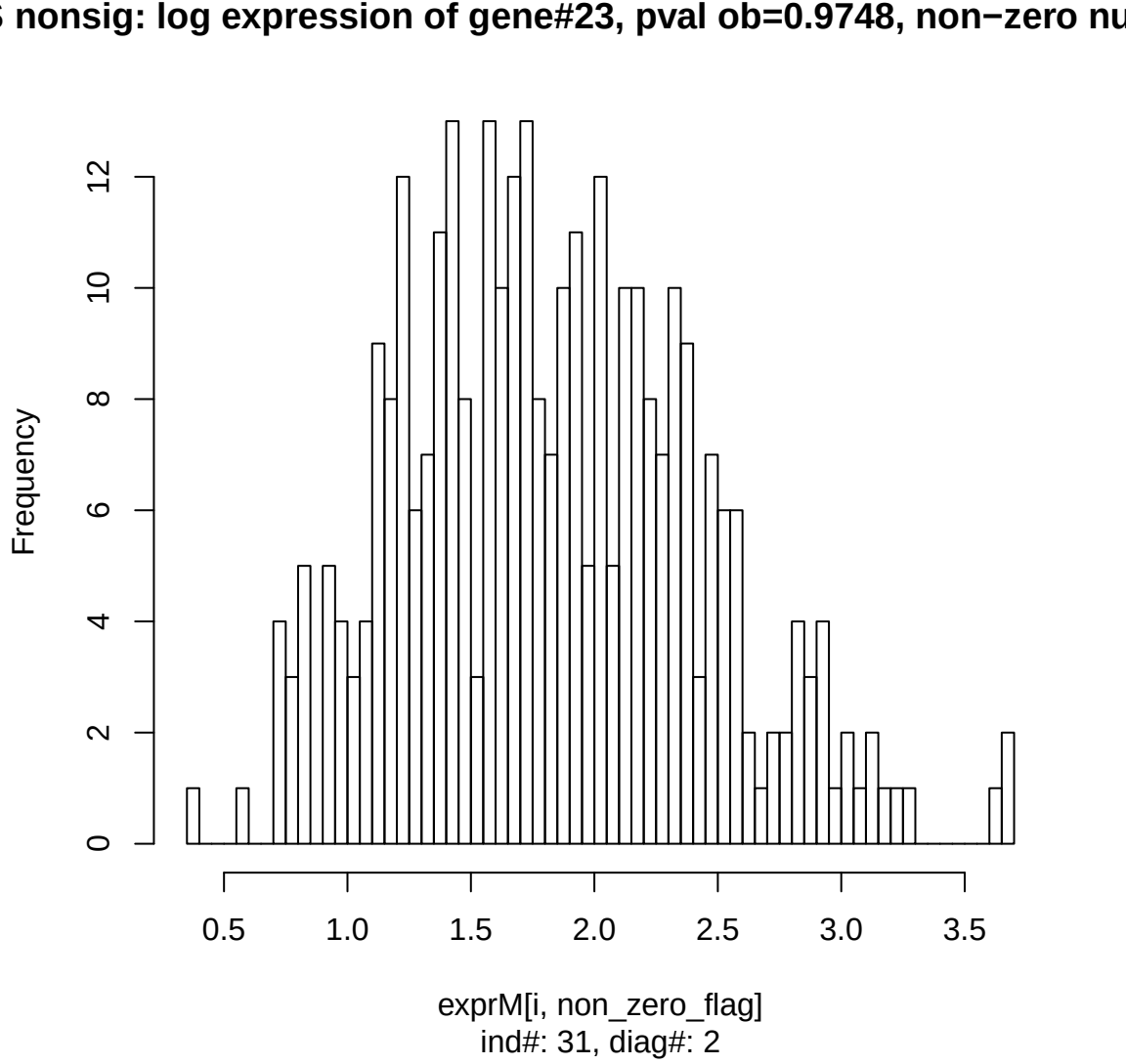

KSless nonsig: individual expression cell count of gene#10
Frequency
0
1
2
3
4
5
6
7
2
4
6
8
10
12
14
table(meta$individual[non_zero_flag])

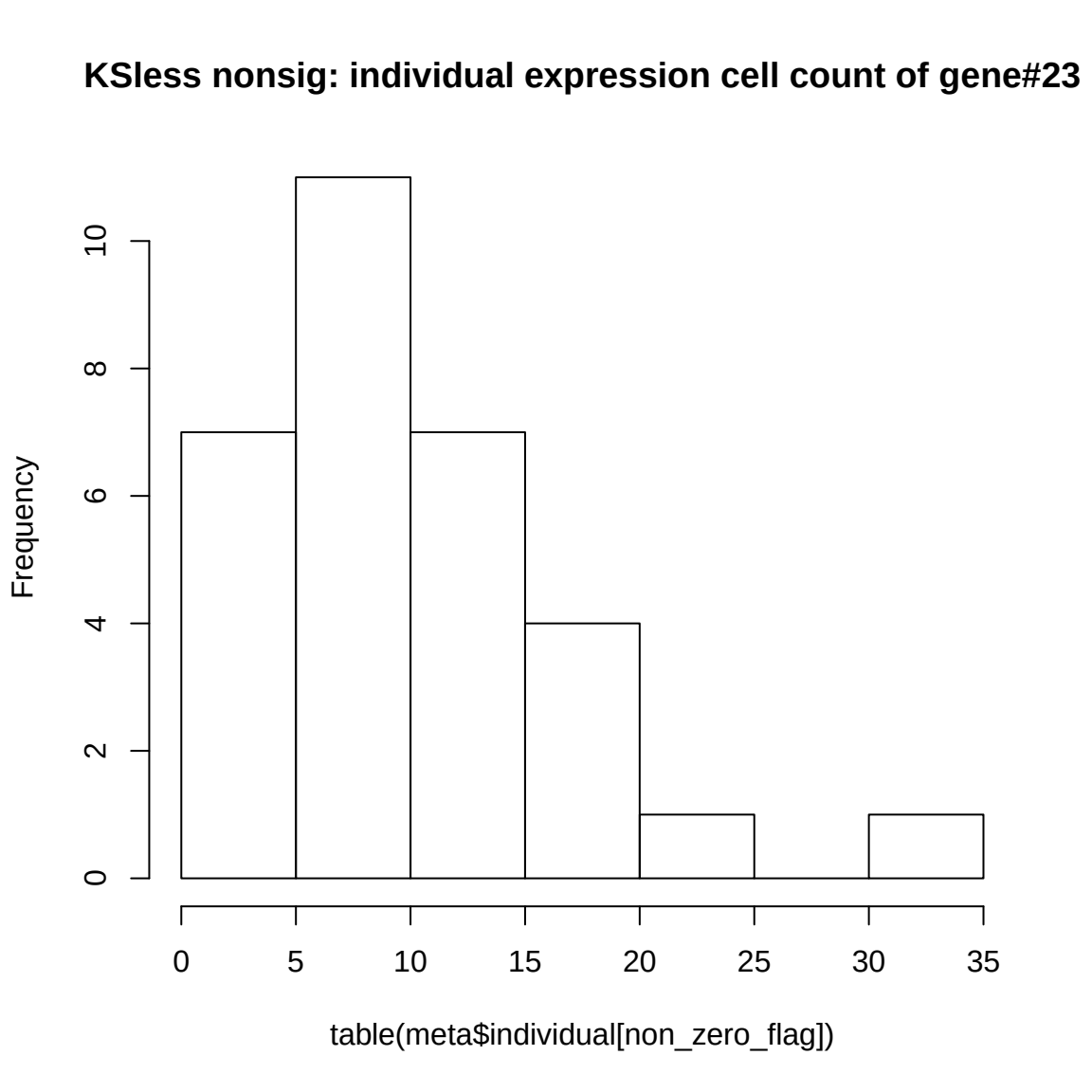

nonsig: log expression of gene#12, pval ob=0.8487, non−zero nu
Frequency
0
2
4
6
8
10
0.5
1.0
1.5
2.0
2.5
3.0
exprM[i, non_zero_flag]
ind#: 29, diag#: 2

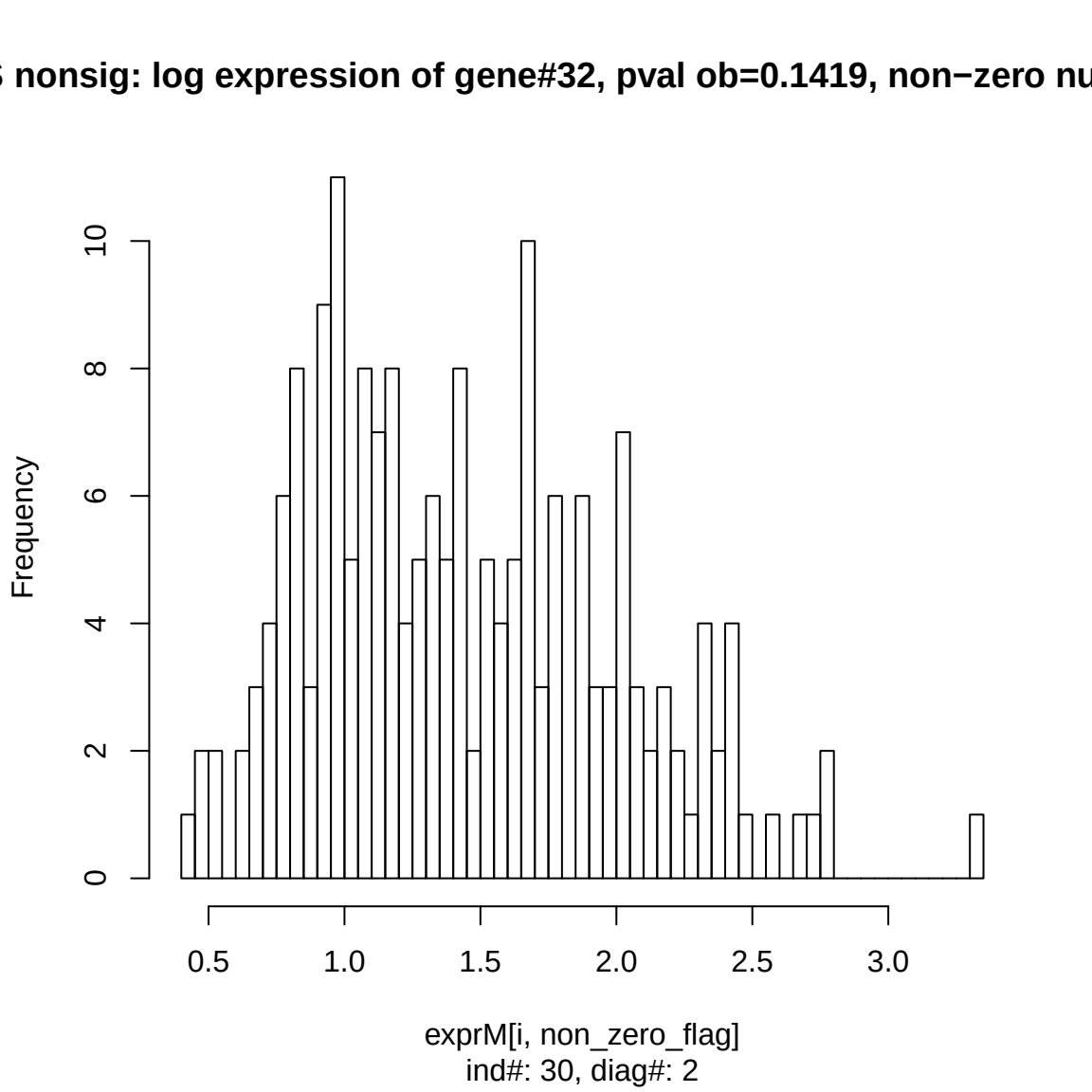

KSless nonsig: individual expression cell count of gene#12
Frequency
0
2
4
6
8
10
2
4
6
8
10
table(meta$individual[non_zero_flag])

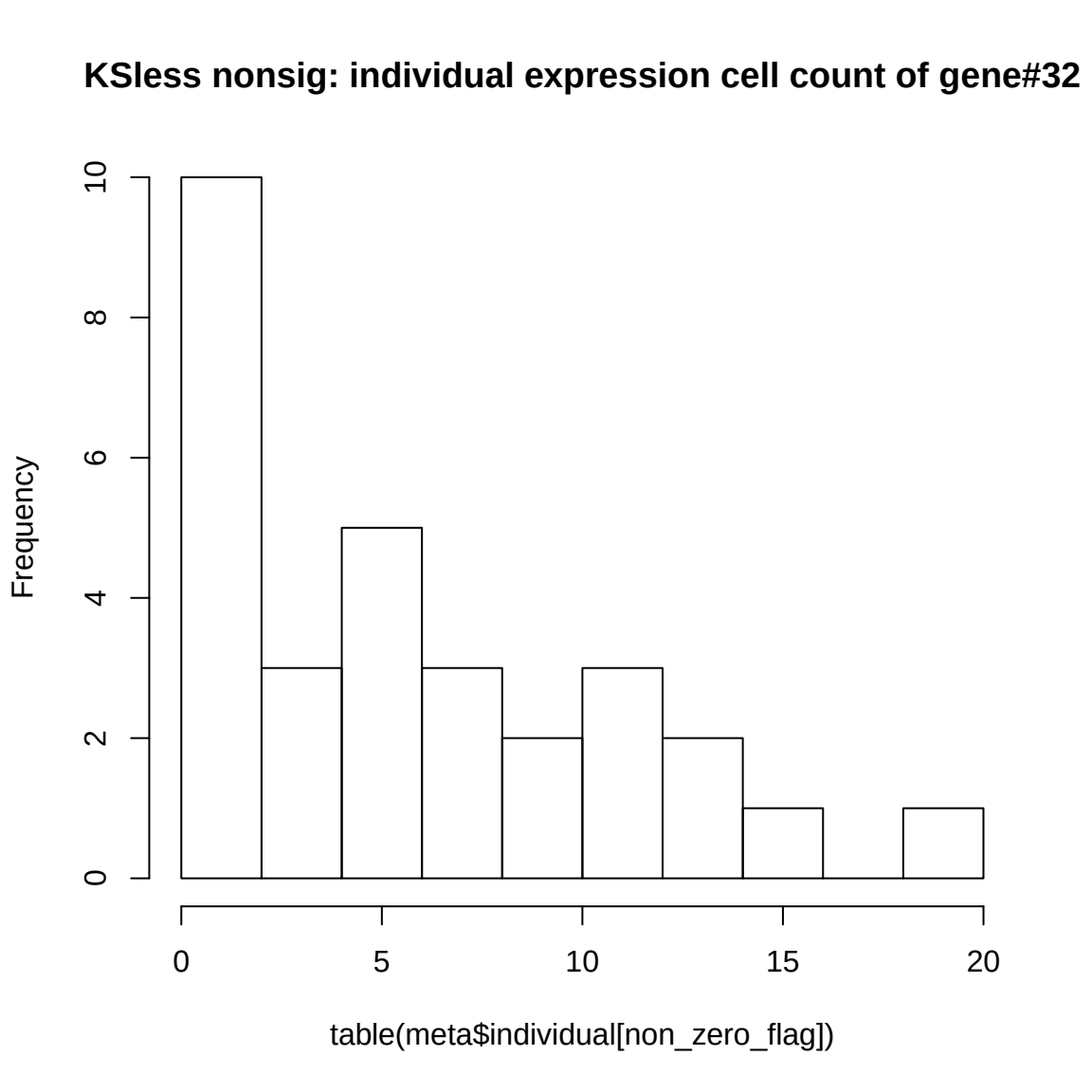

nonsig: log expression of gene#17, pval ob=0.8299, non−zero nu
Frequency
0
5
10
15
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
exprM[i, non_zero_flag]
ind#: 31, diag#: 2

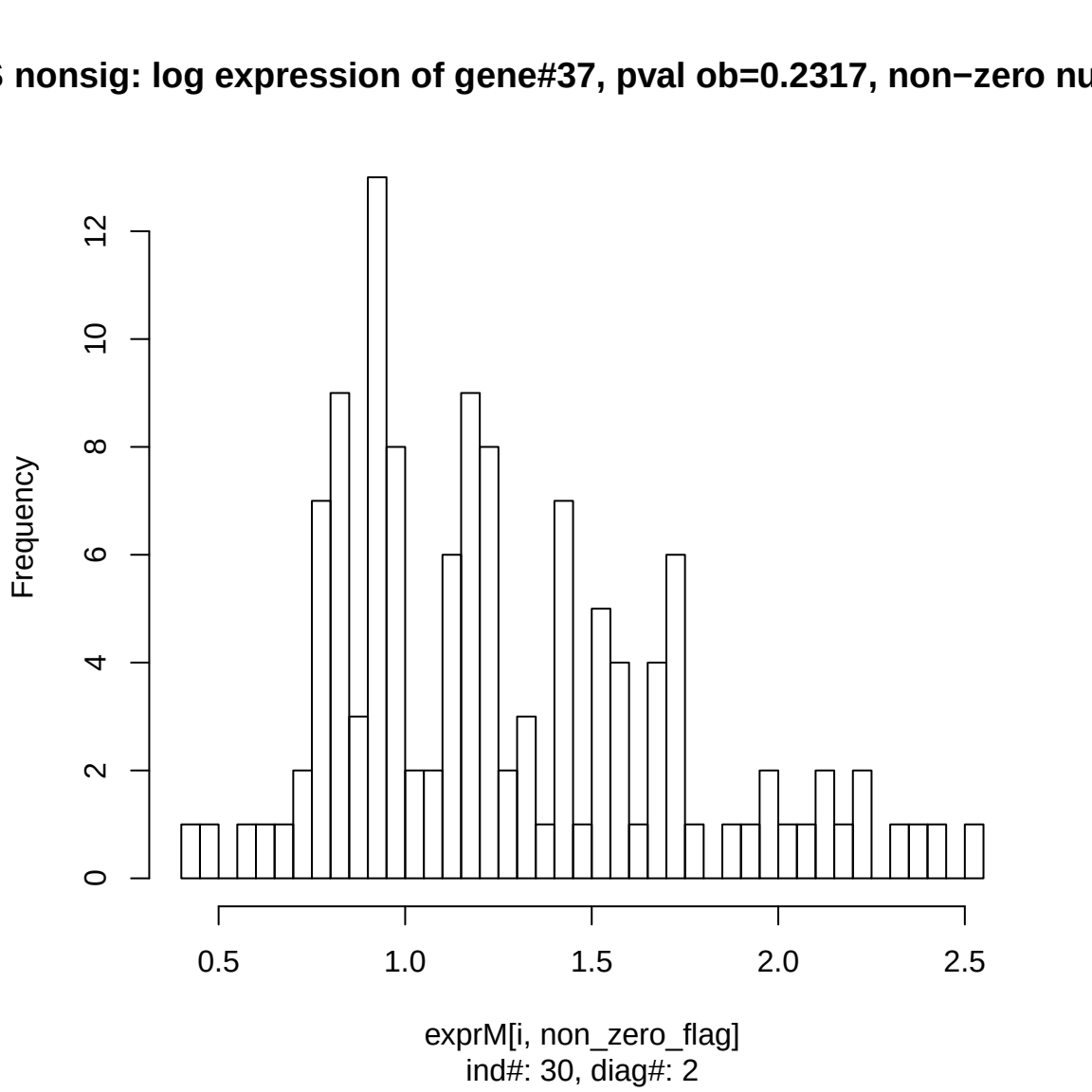

KSless nonsig: individual expression cell count of gene#17
Frequency
0
2
4
6
8
0
5
10
15
20
table(meta$individual[non_zero_flag])

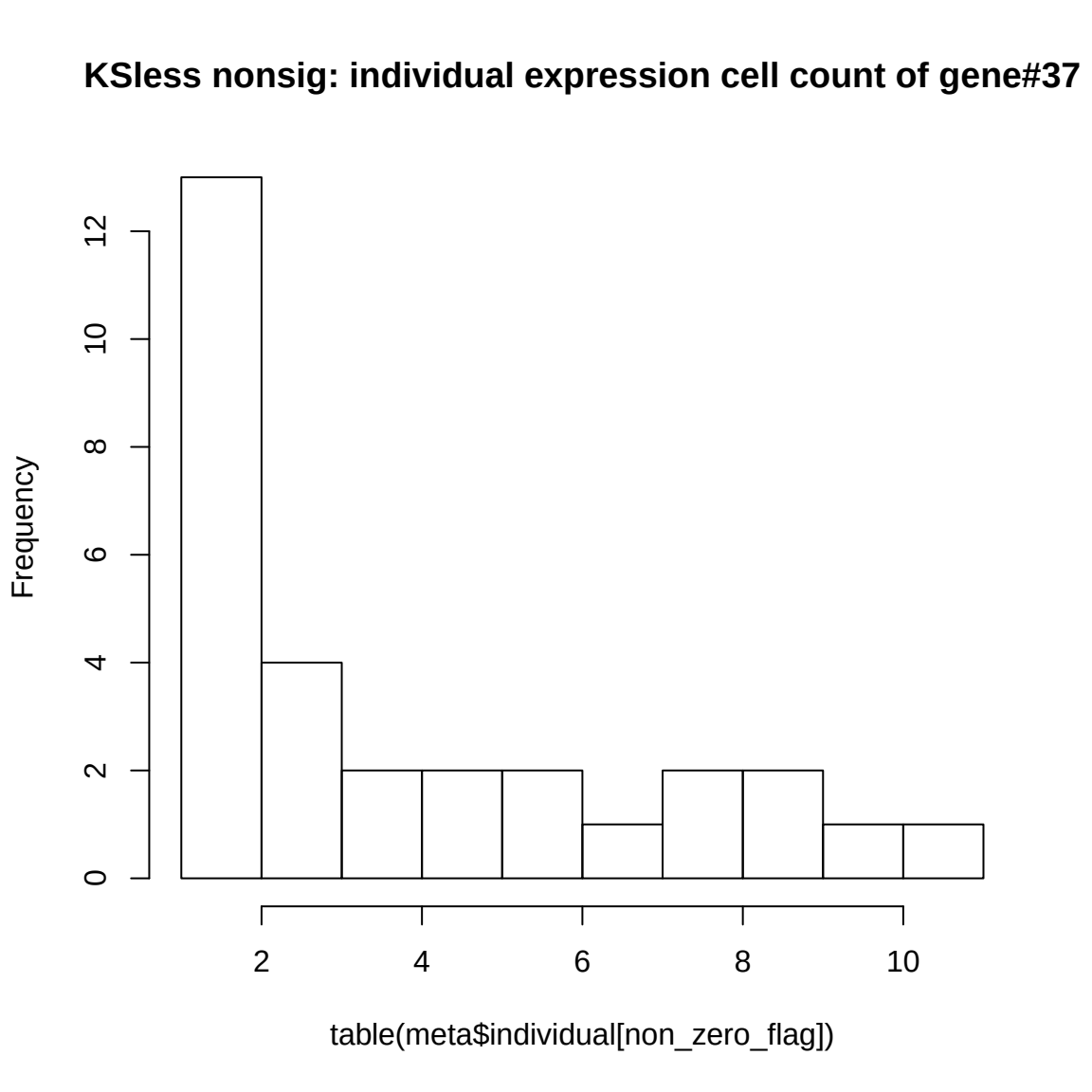

nonsig: log expression of gene#23, pval ob=0.9748, non−zero nu
Frequency
0
2
4
6
8
10
12
0.5
1.0
1.5
2.0
2.5
3.0
3.5
exprM[i, non_zero_flag]
ind#: 31, diag#: 2

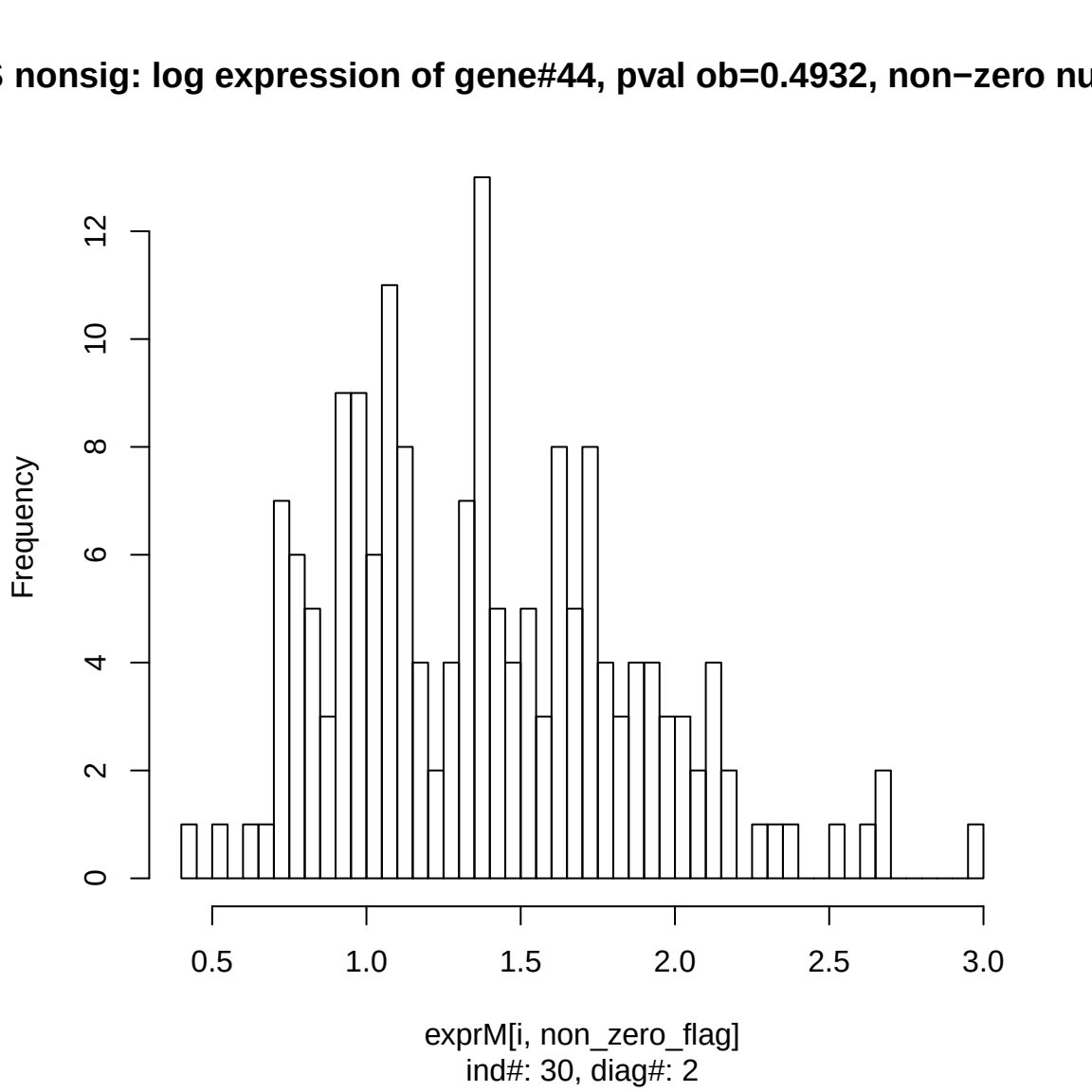

KSless nonsig: individual expression cell count of gene#23
Frequency
0
2
4
6
8
10
0
5
10
15
20
25
30
35
table(meta$individual[non_zero_flag])

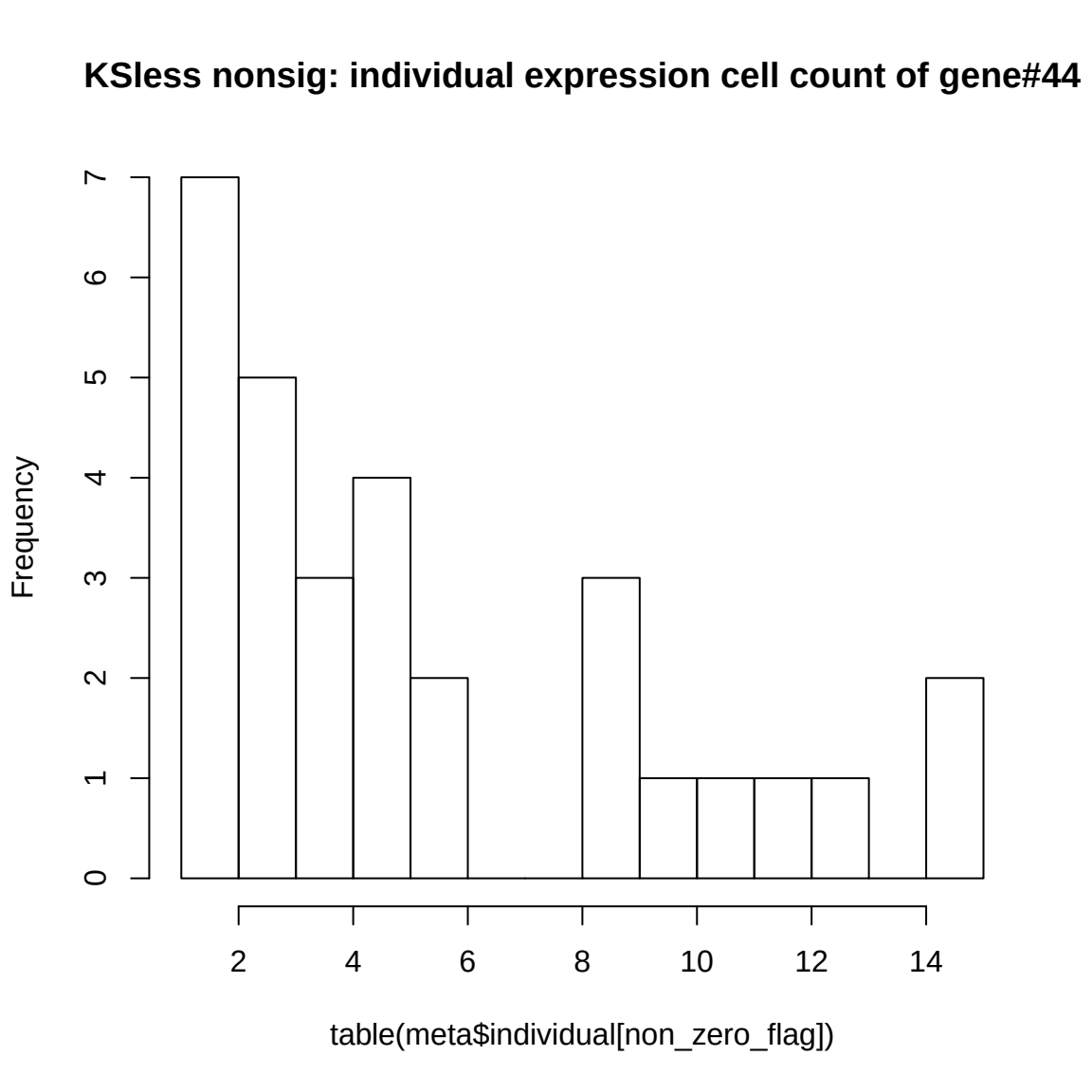

nonsig: log expression of gene#32, pval ob=0.1419, non−zero nu
Frequency
0
2
4
6
8
10
0.5
1.0
1.5
2.0
2.5
3.0
exprM[i, non_zero_flag]
ind#: 30, diag#: 2

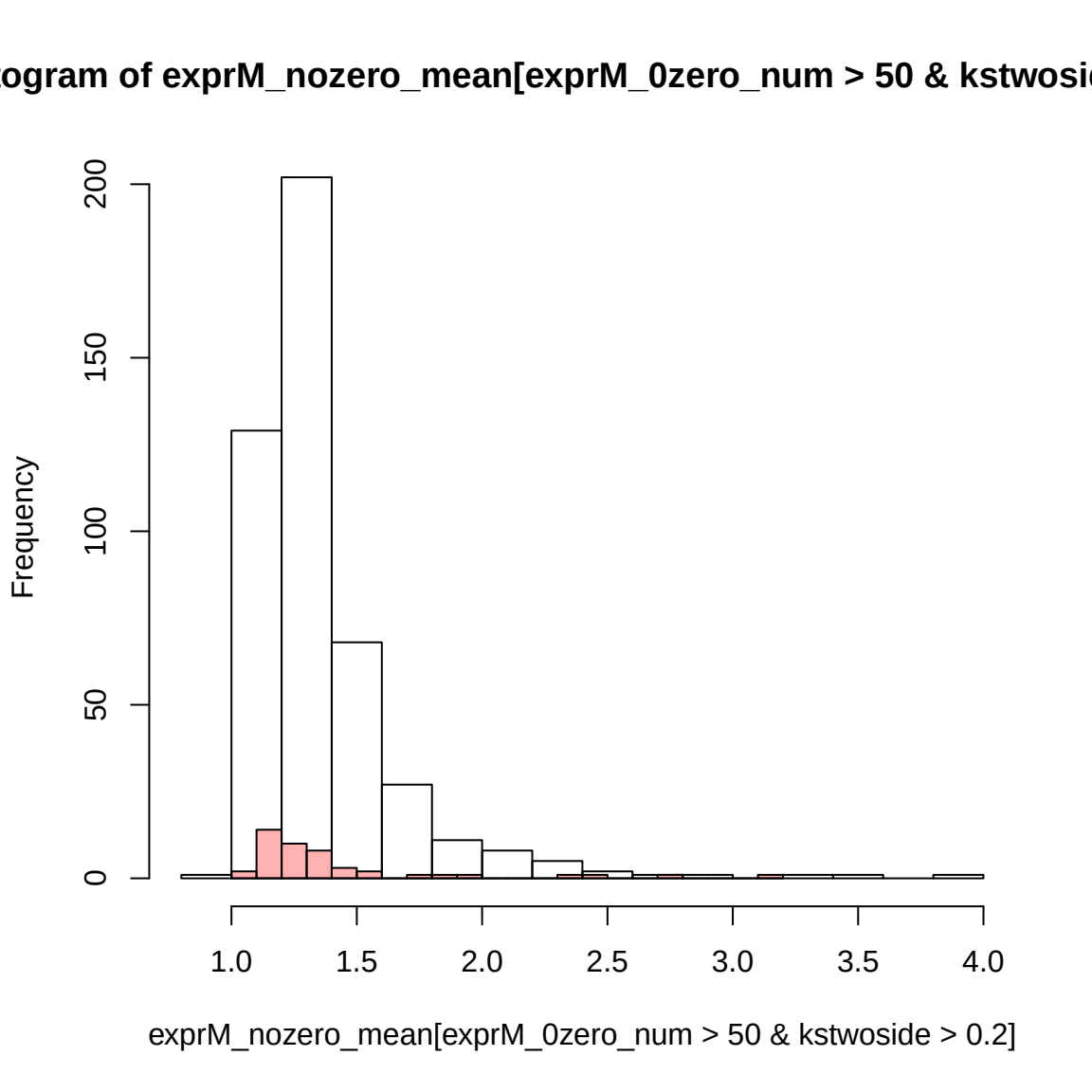

KSless nonsig: individual expression cell count of gene#32
Frequency
0
2
4
6
8
10
0
5
10
15
20
table(meta$individual[non_zero_flag])

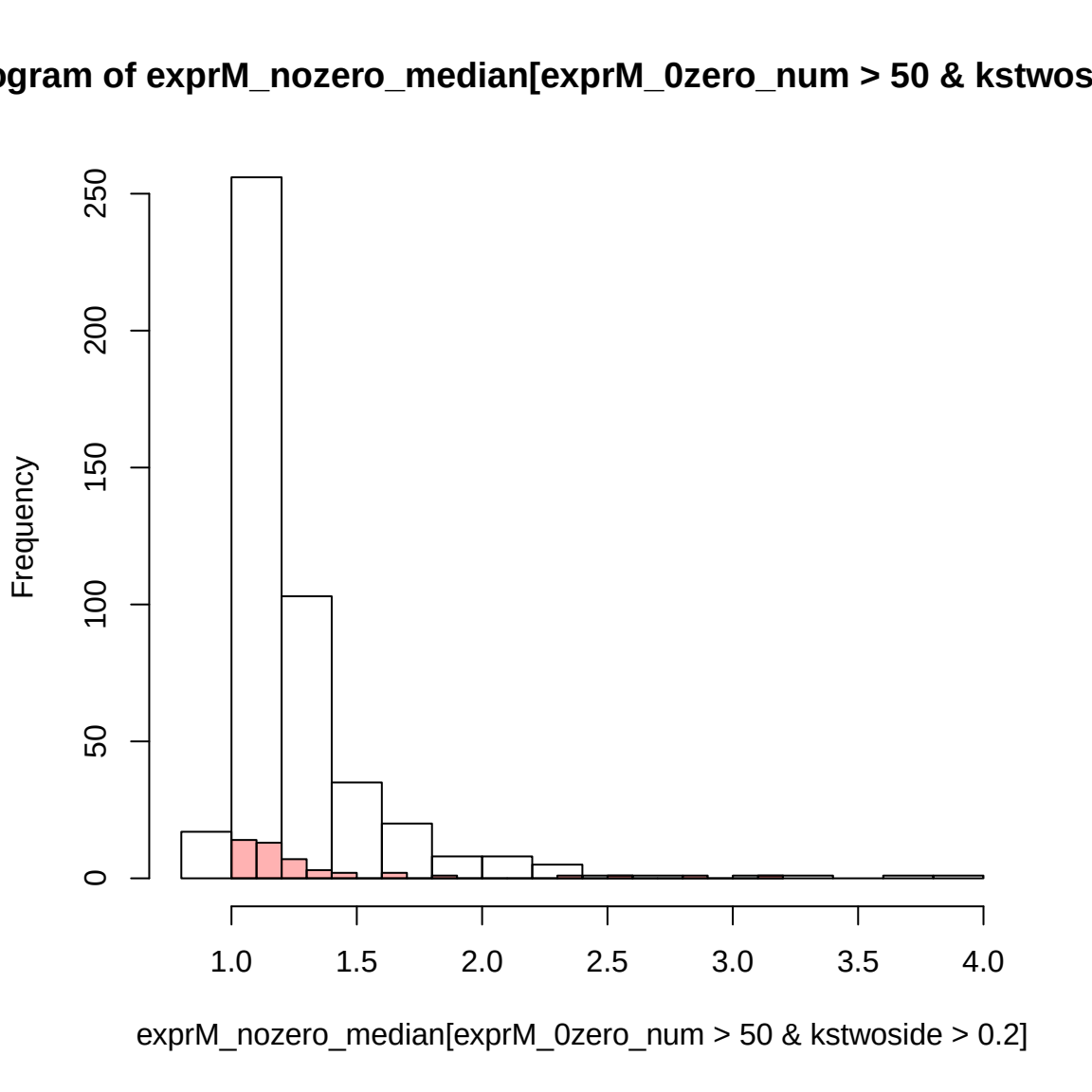

nonsig: log expression of gene#37, pval ob=0.2317, non−zero nu
Frequency
0
2
4
6
8
10
12
0.5
1.0
1.5
2.0
2.5
exprM[i, non_zero_flag]
ind#: 30, diag#: 2

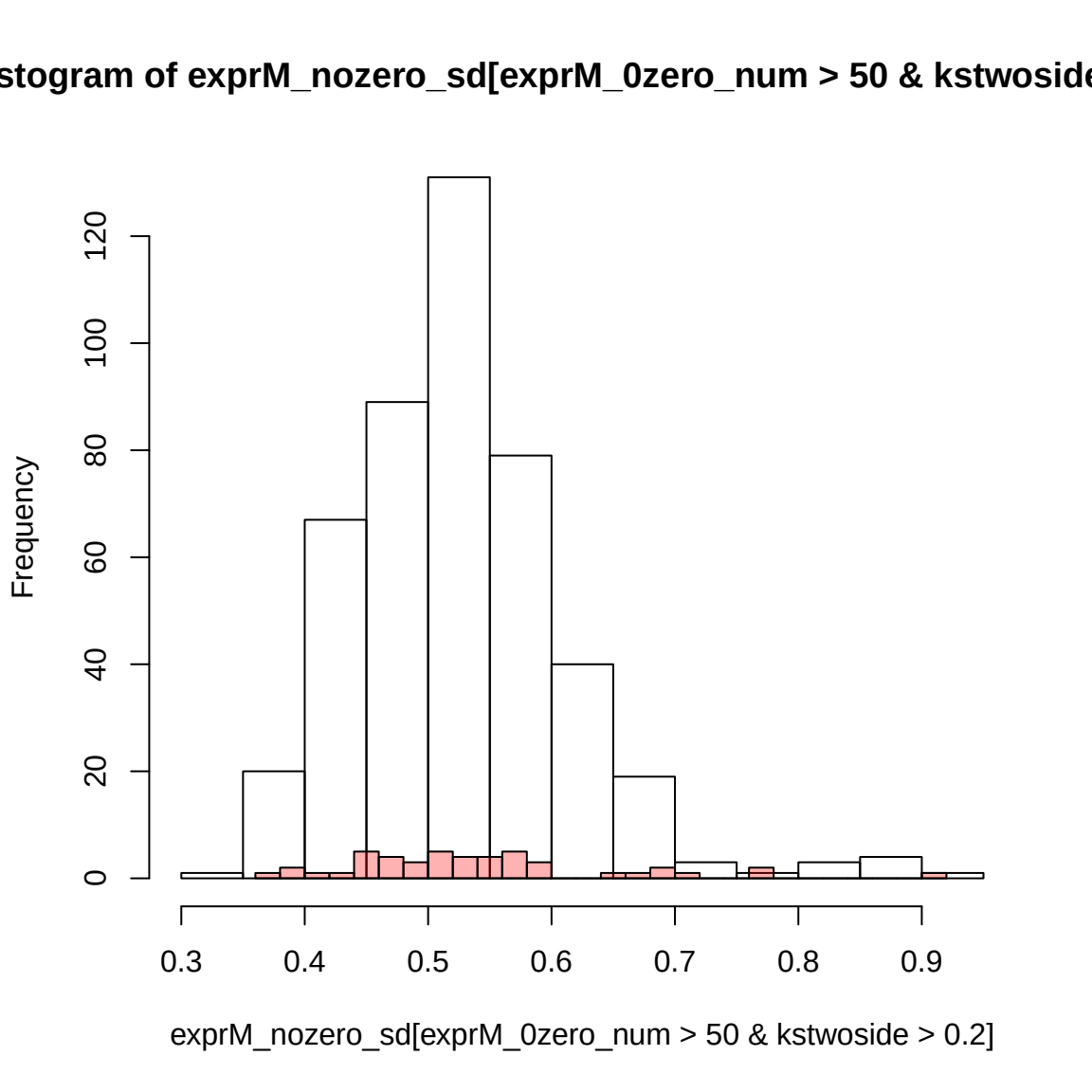

KSless nonsig: individual expression cell count of gene#37
Frequency
0
2
4
6
8
10
12
2
4
6
8
10
table(meta$individual[non_zero_flag])

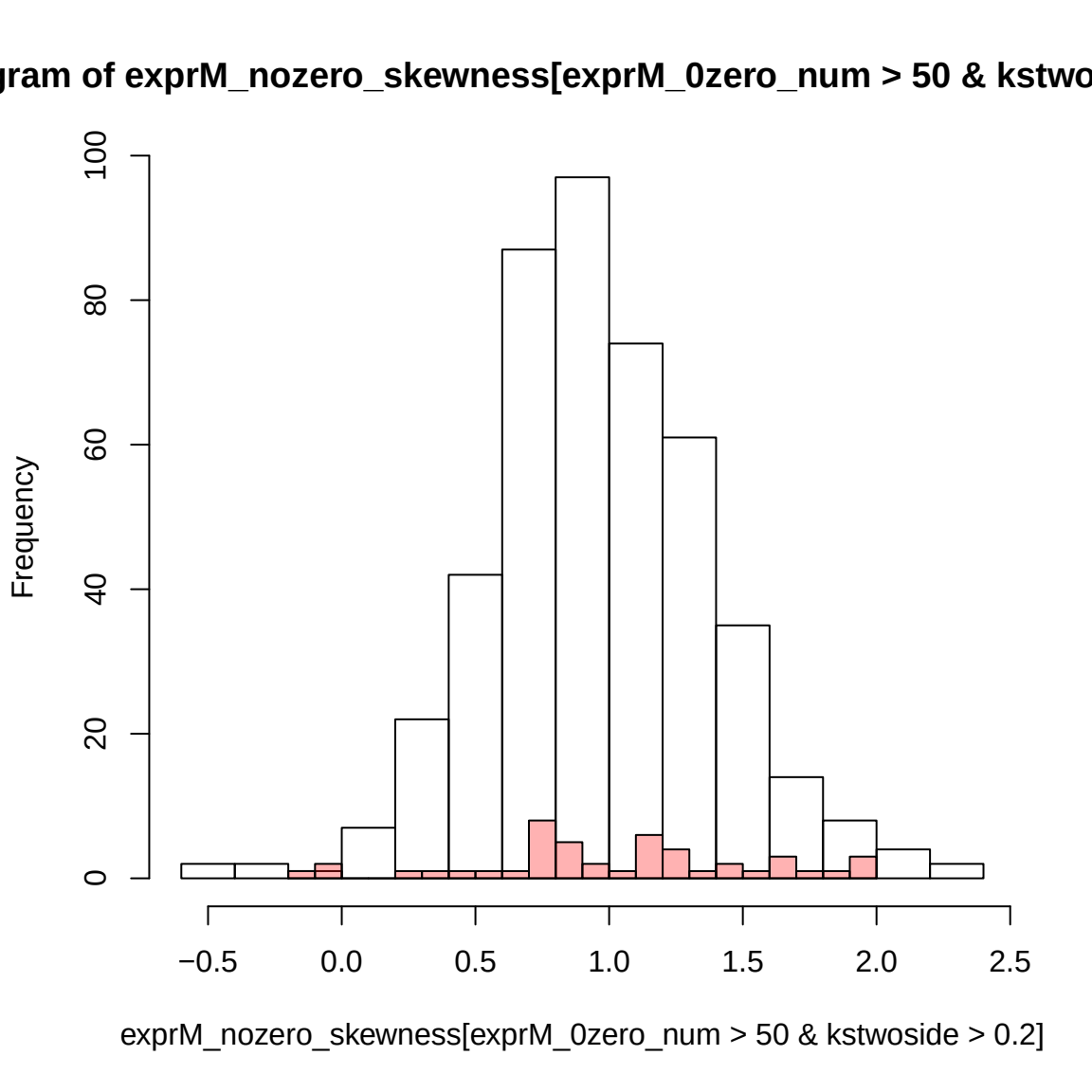

nonsig: log expression of gene#44, pval ob=0.4932, non−zero nu
Frequency
0
2
4
6
8
10
12
0.5
1.0
1.5
2.0
2.5
3.0
exprM[i, non_zero_flag]
ind#: 30, diag#: 2

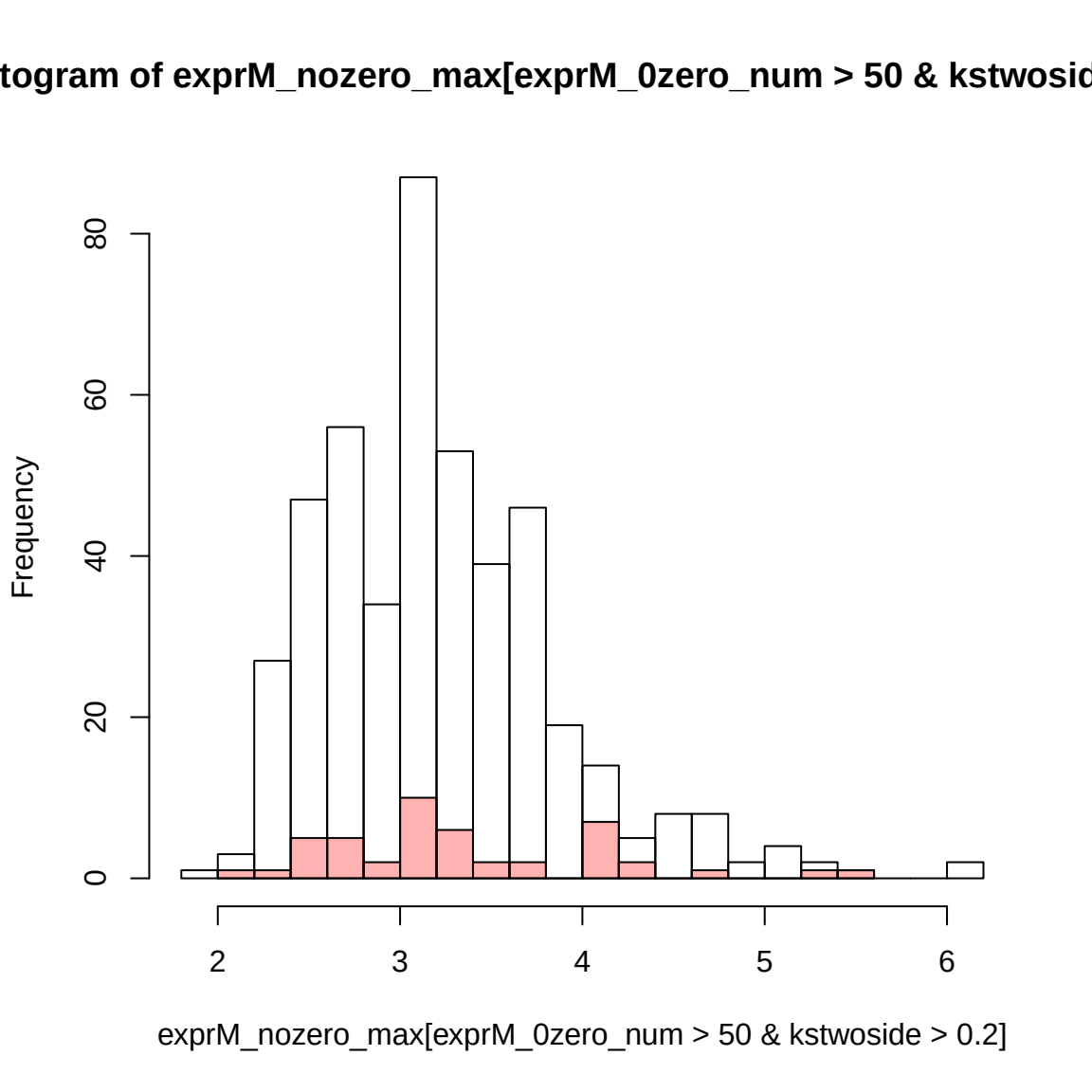

KSless nonsig: individual expression cell count of gene#44
Frequency
0
1
2
3
4
5
6
7
2
4
6
8
10
12
14
table(meta$individual[non_zero_flag])

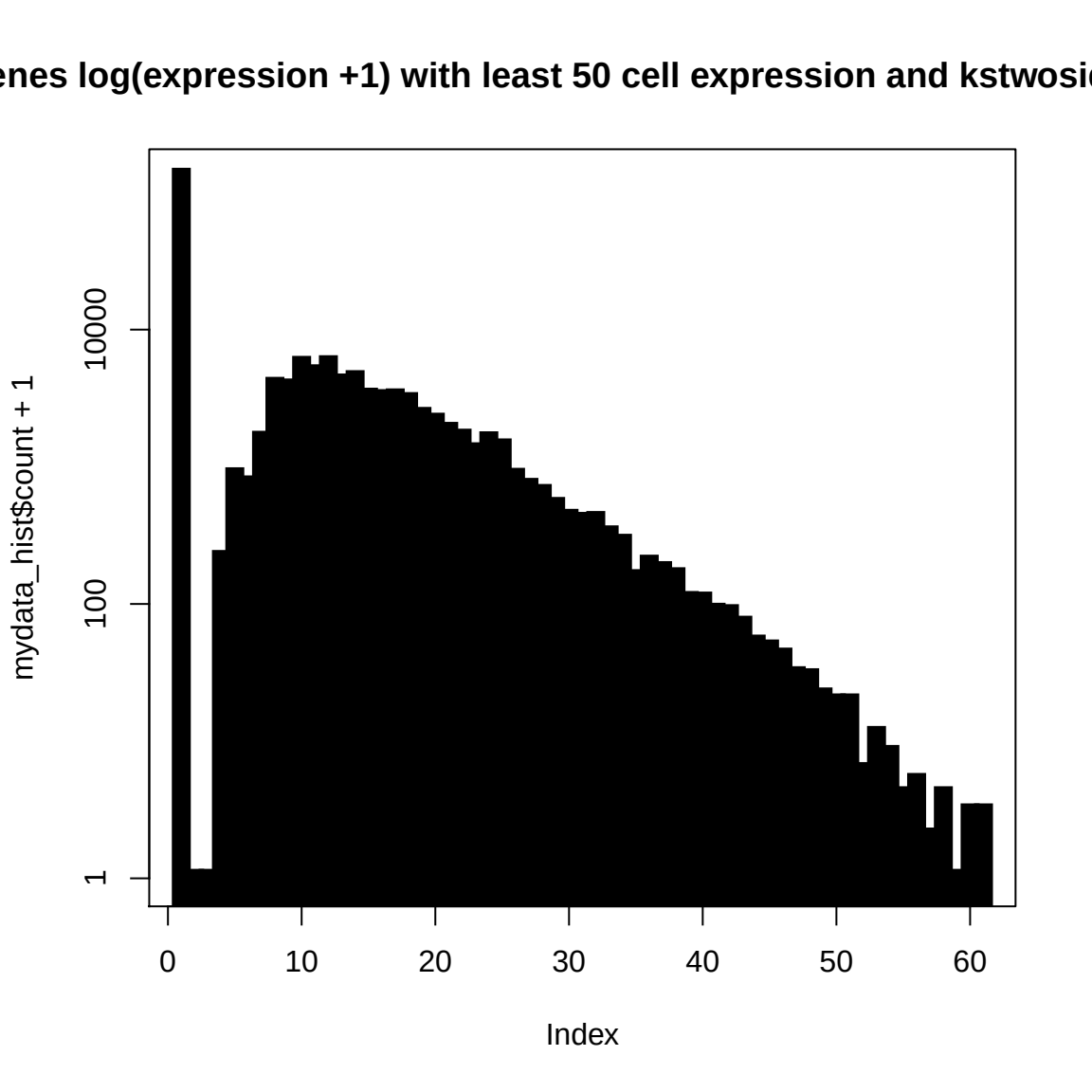

togram of exprM_nozero_mean[exprM_0zero_num > 50 & kstwosi
Frequency
0
50
100
150
200
1.0
1.5
2.0
2.5
3.0
3.5
4.0
exprM_nozero_mean[exprM_0zero_num > 50 & kstwoside > 0.2]

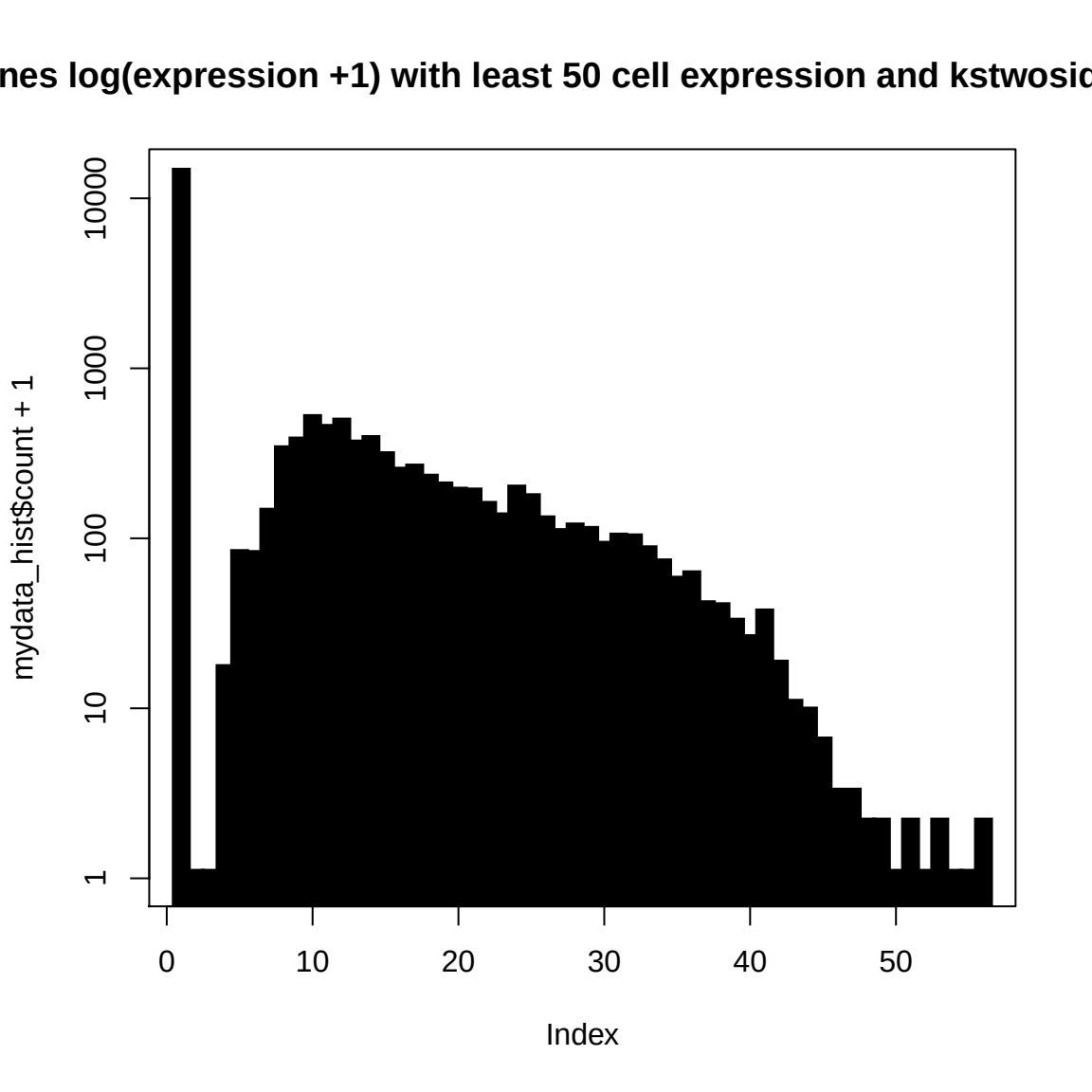

ogram of exprM_nozero_median[exprM_0zero_num > 50 & kstwos
Frequency
0
50
100
150
200
250
1.0
1.5
2.0
2.5
3.0
3.5
4.0
exprM_nozero_median[exprM_0zero_num > 50 & kstwoside > 0.2]

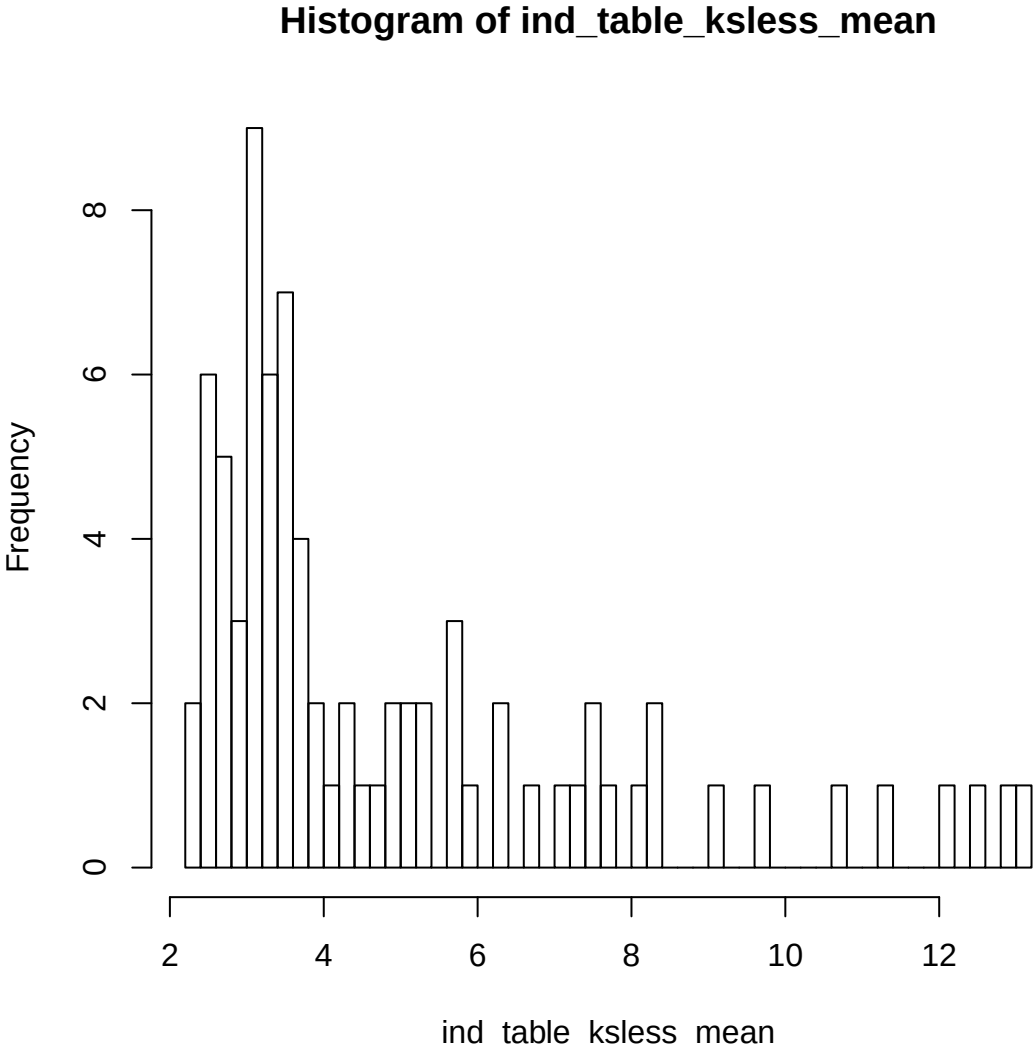

stogram of exprM_nozero_sd[exprM_0zero_num > 50 & kstwoside
Frequency
0
20
40
60
80
100
120
0.3
0.4
0.5
0.6
0.7
0.8
0.9
exprM_nozero_sd[exprM_0zero_num > 50 & kstwoside > 0.2]

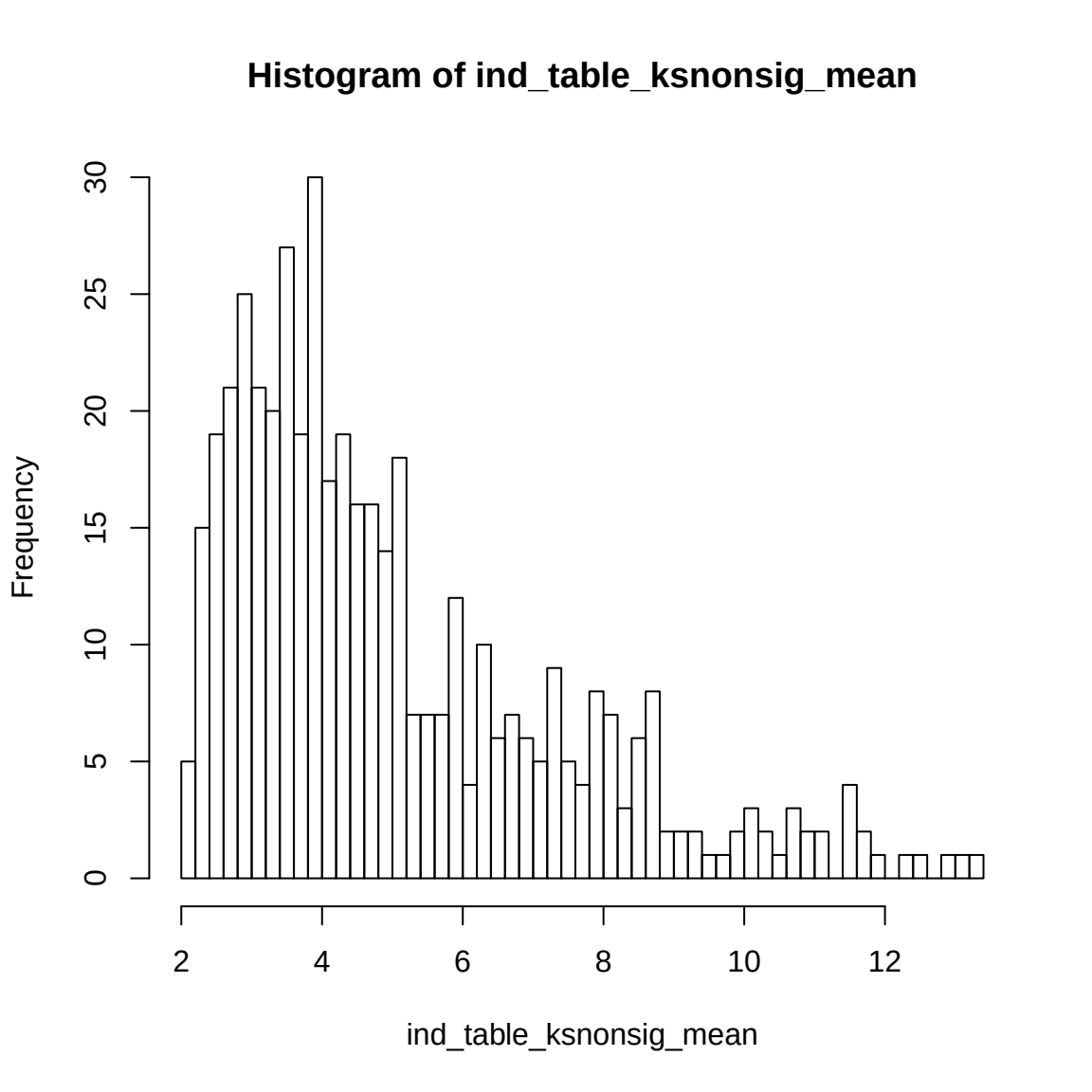

gram of exprM_nozero_skewness[exprM_0zero_num > 50 & kstwo
Frequency
0
20
40
60
80
100
−0.5
0.0
0.5
1.0
1.5
2.0
2.5
exprM_nozero_skewness[exprM_0zero_num > 50 & kstwoside > 0.2]

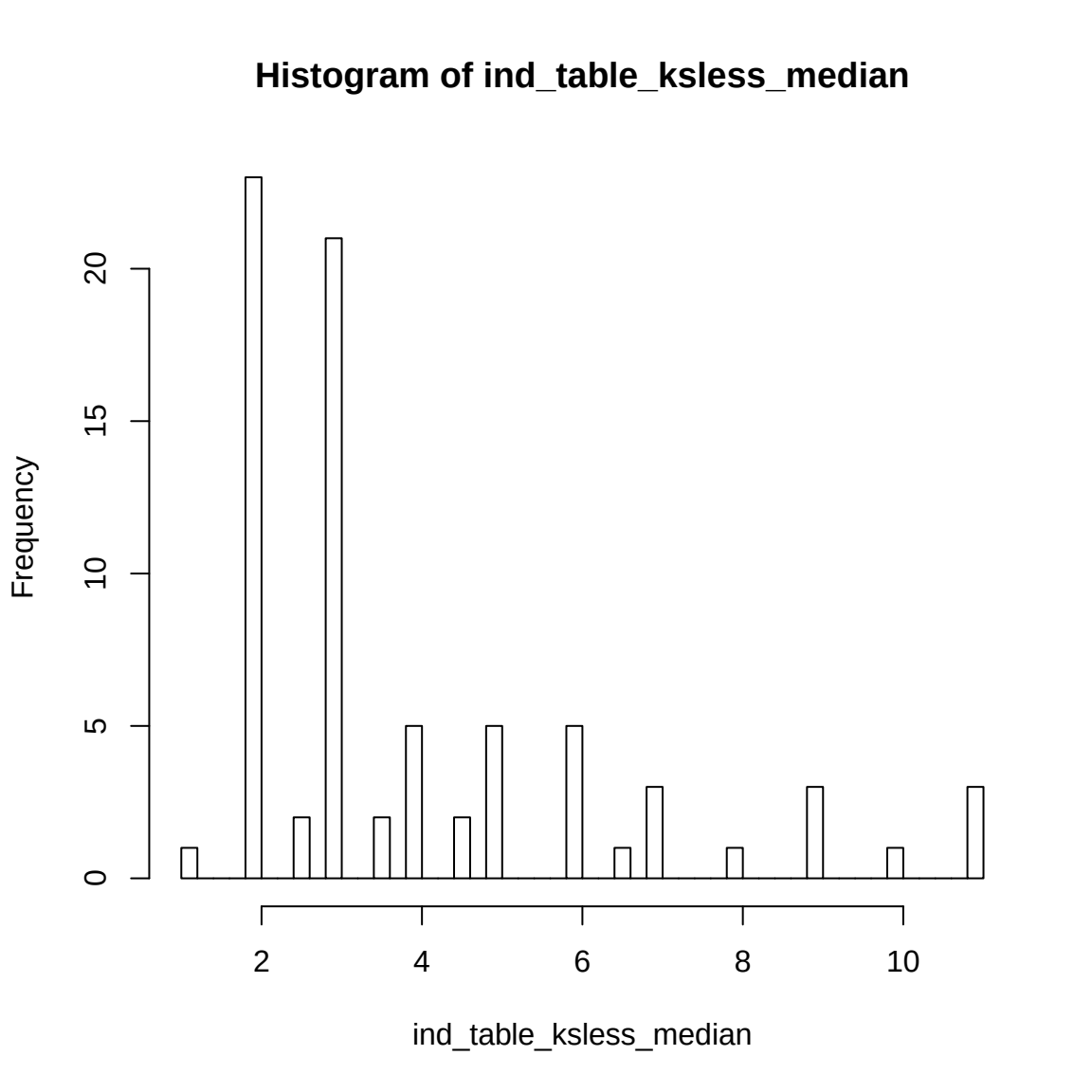

togram of exprM_nozero_max[exprM_0zero_num > 50 & kstwosid
Frequency
0
20
40
60
80
2
3
4
5
6
exprM_nozero_max[exprM_0zero_num > 50 & kstwoside > 0.2]

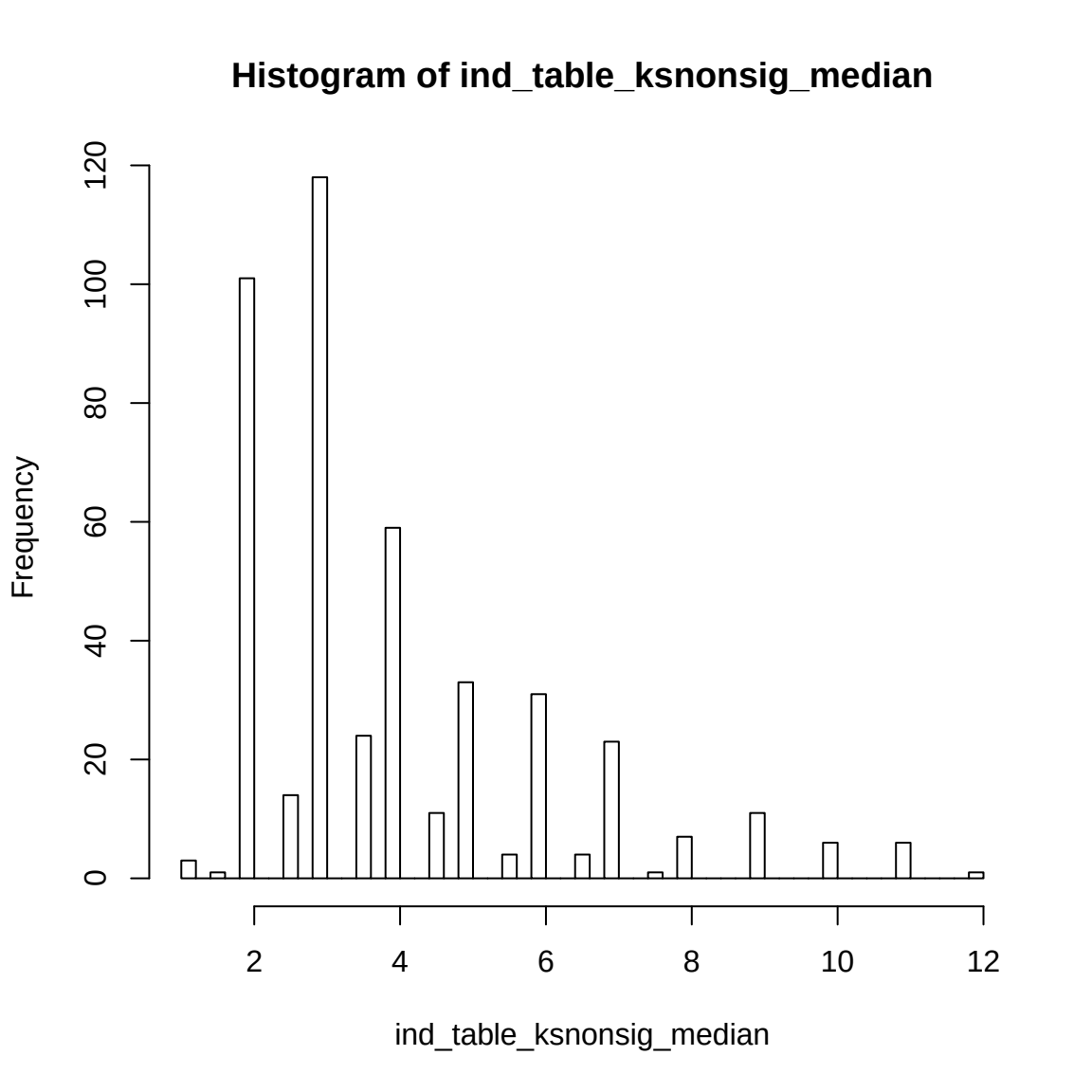

enes log(expression +1) with least 50 cell expression and kstwosi
mydata_hist$count + 1
1
100
10000
0
10
20
30
40
50
60
Index

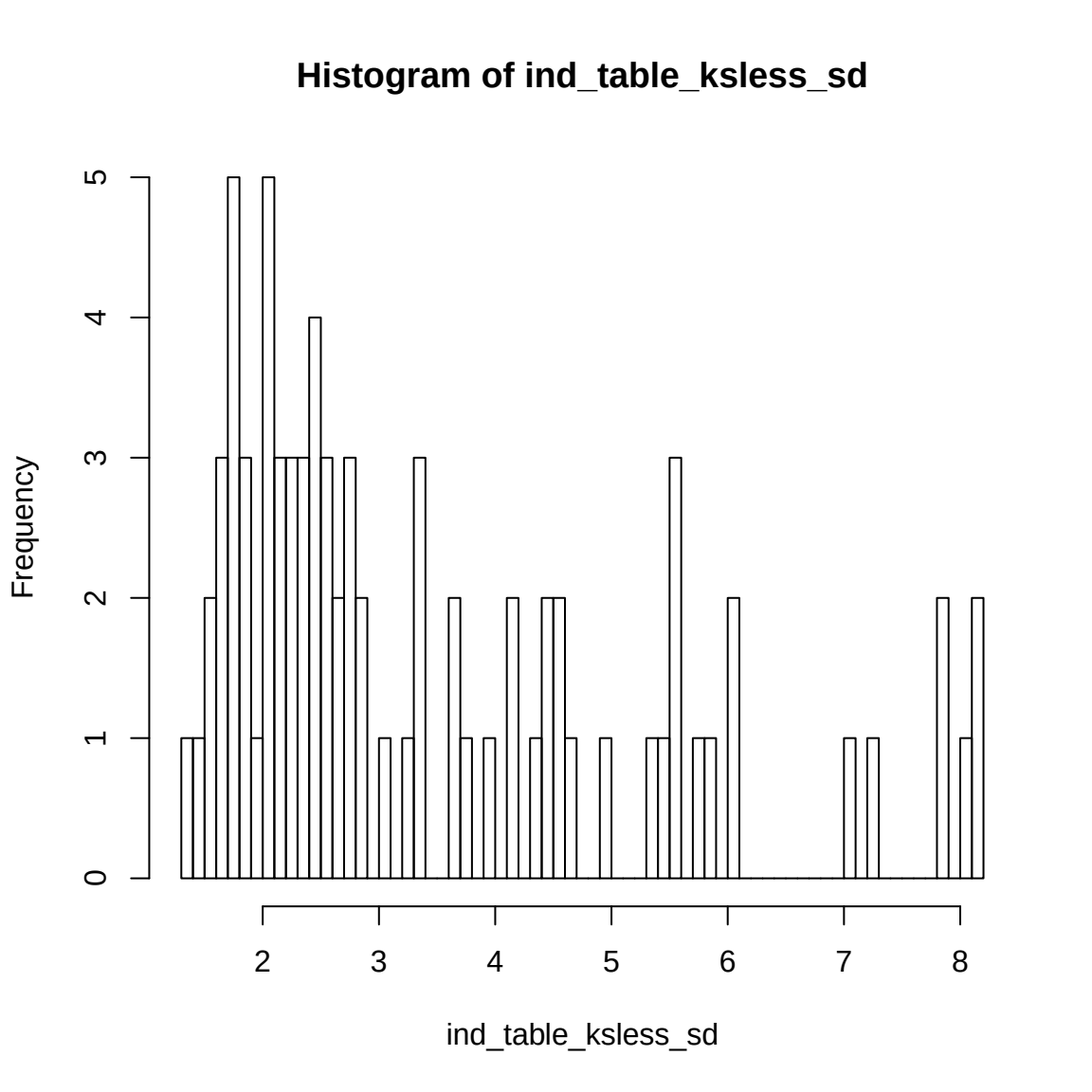

nes log(expression +1) with least 50 cell expression and kstwosic
mydata_hist$count + 1
1
10
100
1000
10000
0
10
20
30
40
50
Index

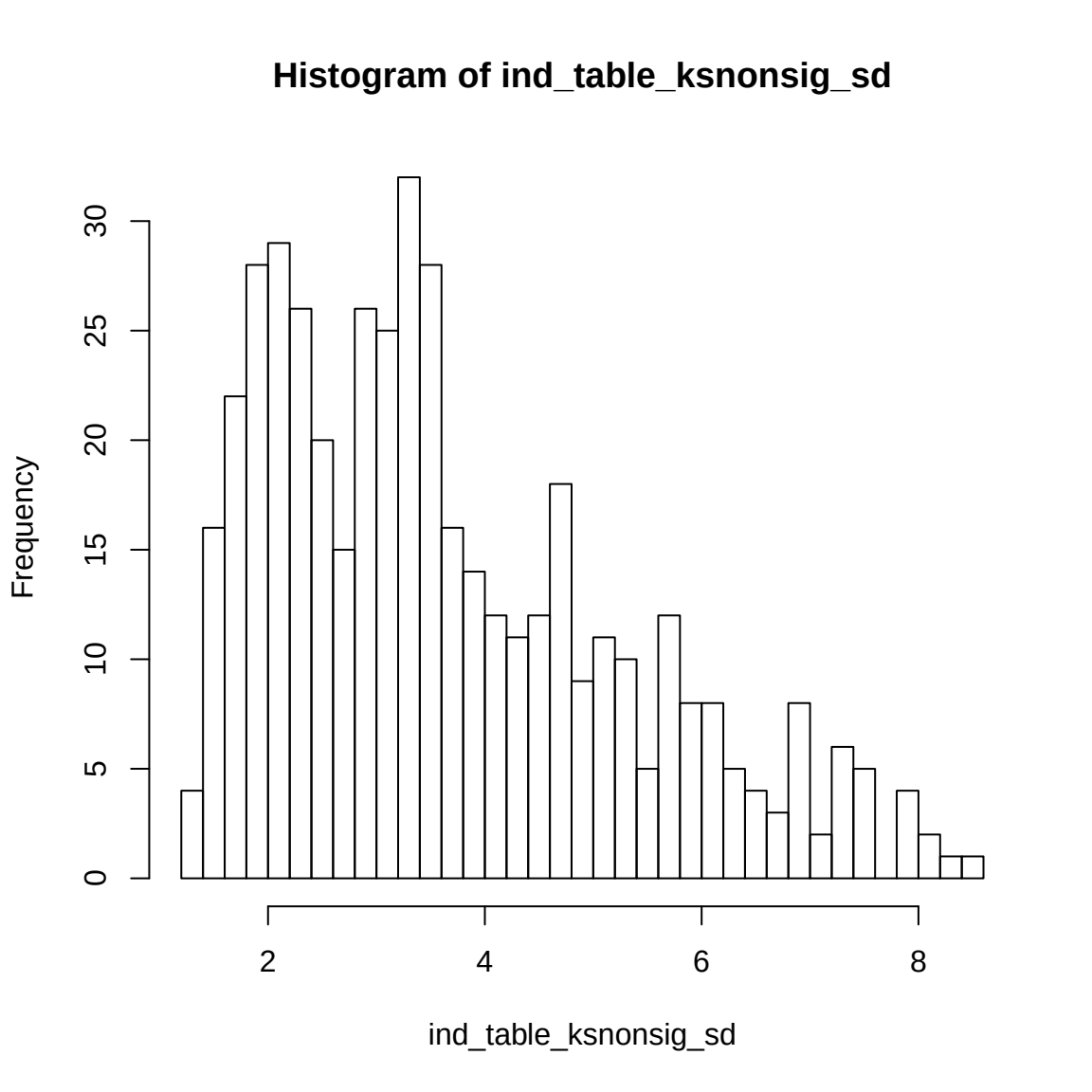

Histogram of ind_table_ksless_mean
Frequency
0
2
4
6
8
2
4
6
8
10
12
ind_table_ksless_mean

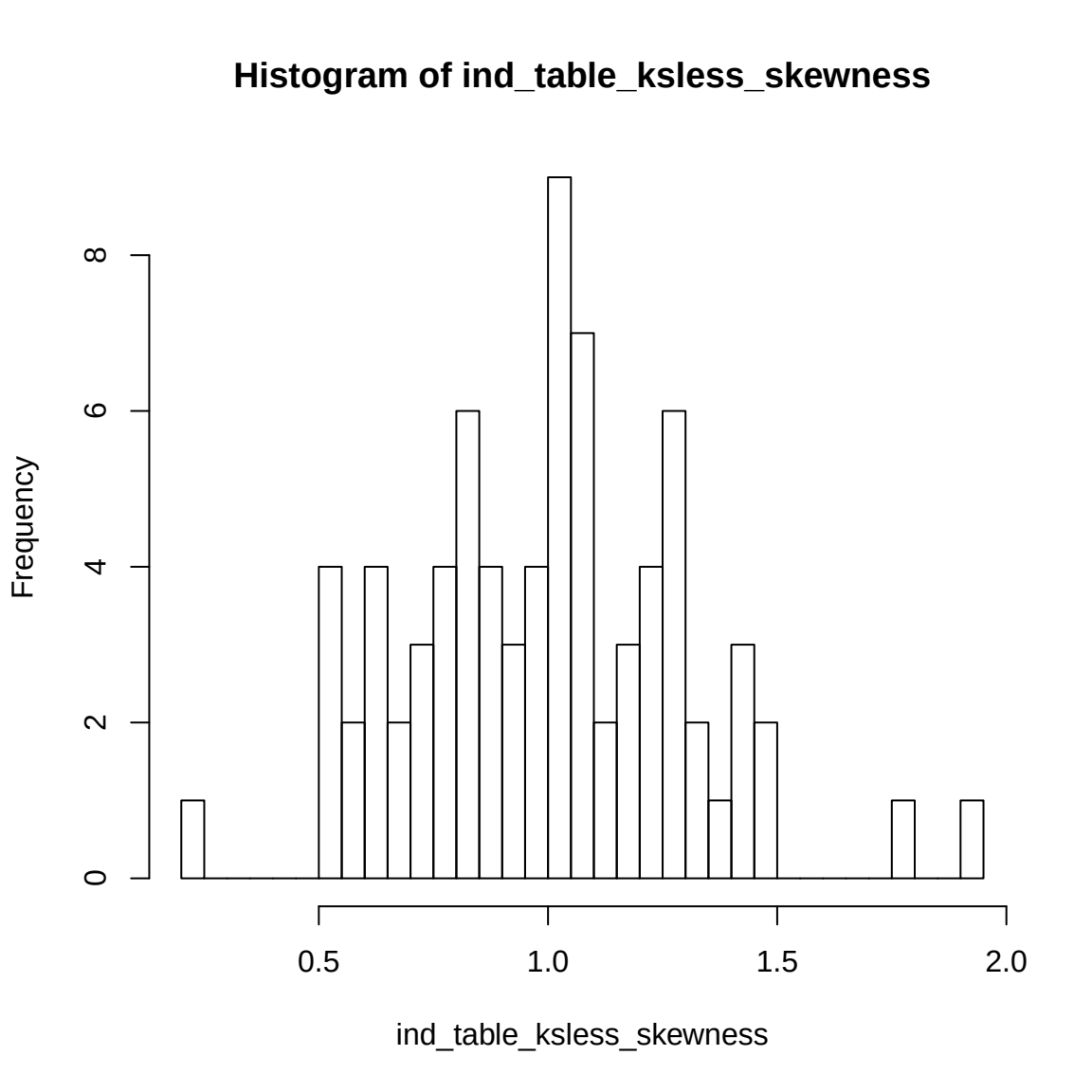

Histogram of ind_table_ksnonsig_mean
Frequency
0
5
10
15
20
25
30
2
4
6
8
10
12
ind_table_ksnonsig_mean

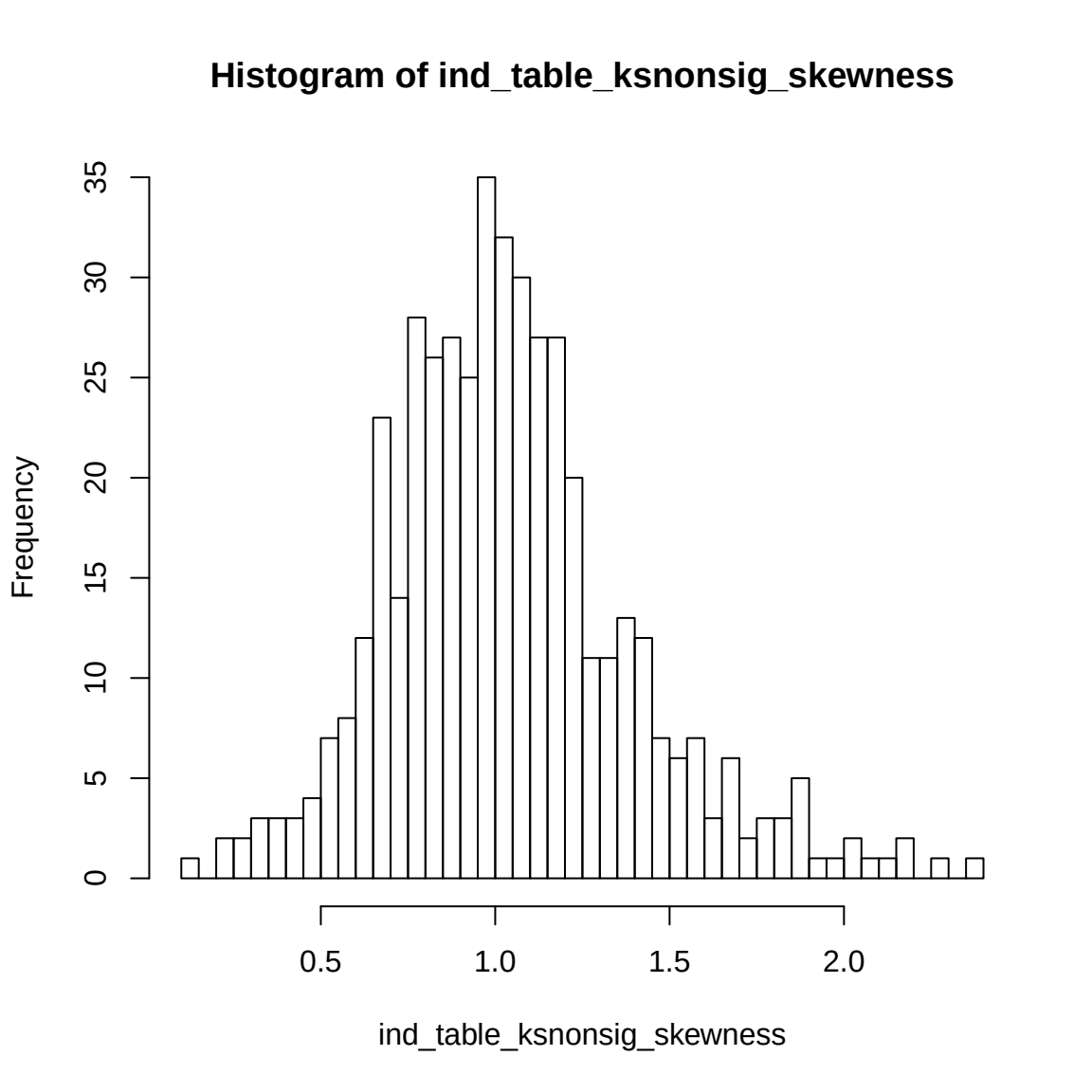

Histogram of ind_table_ksless_median
Frequency
0
5
10
15
20
2
4
6
8
10
ind_table_ksless_median

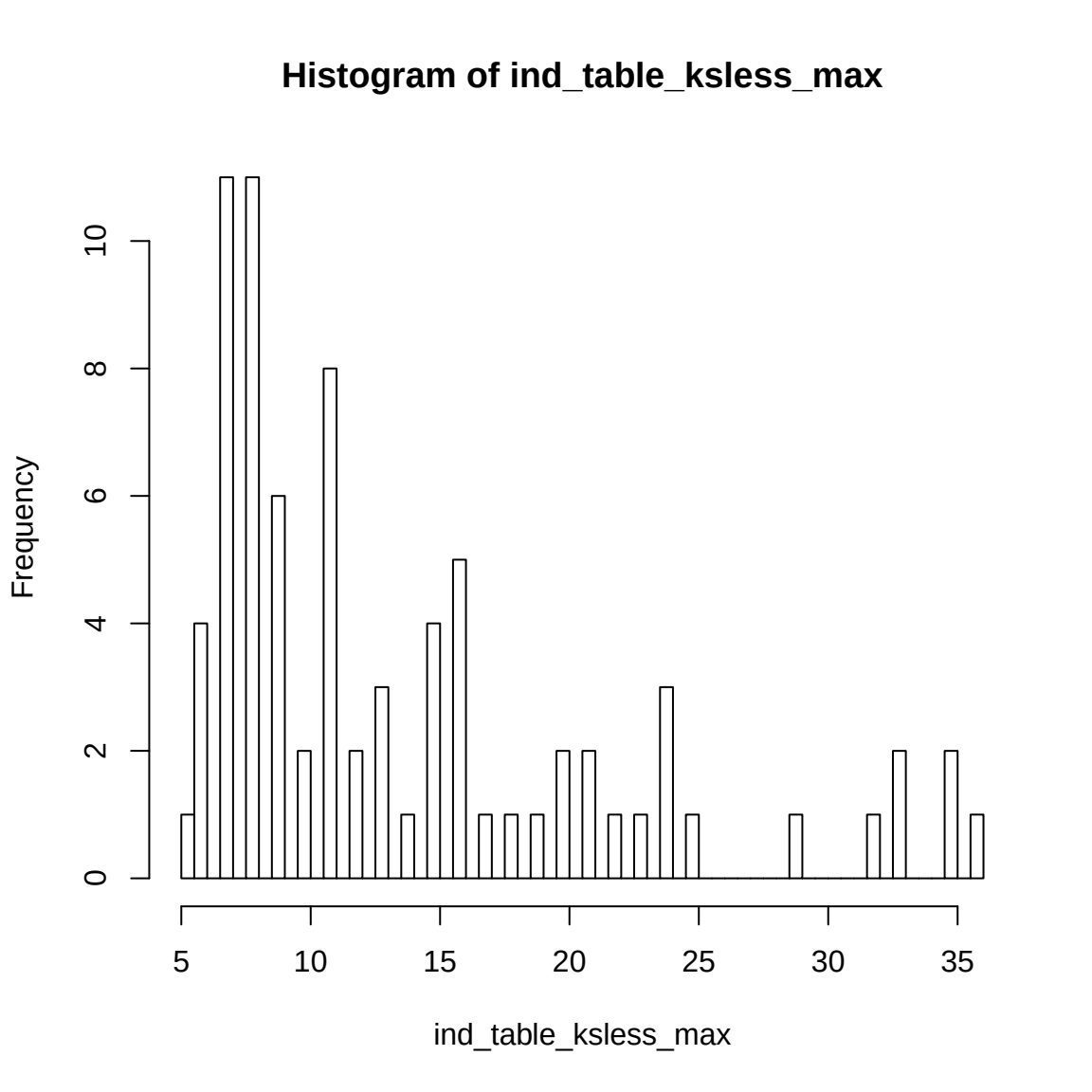

Histogram of ind_table_ksnonsig_median
Frequency
0
20
40
60
80
100
120
2
4
6
8
10
12
ind_table_ksnonsig_median

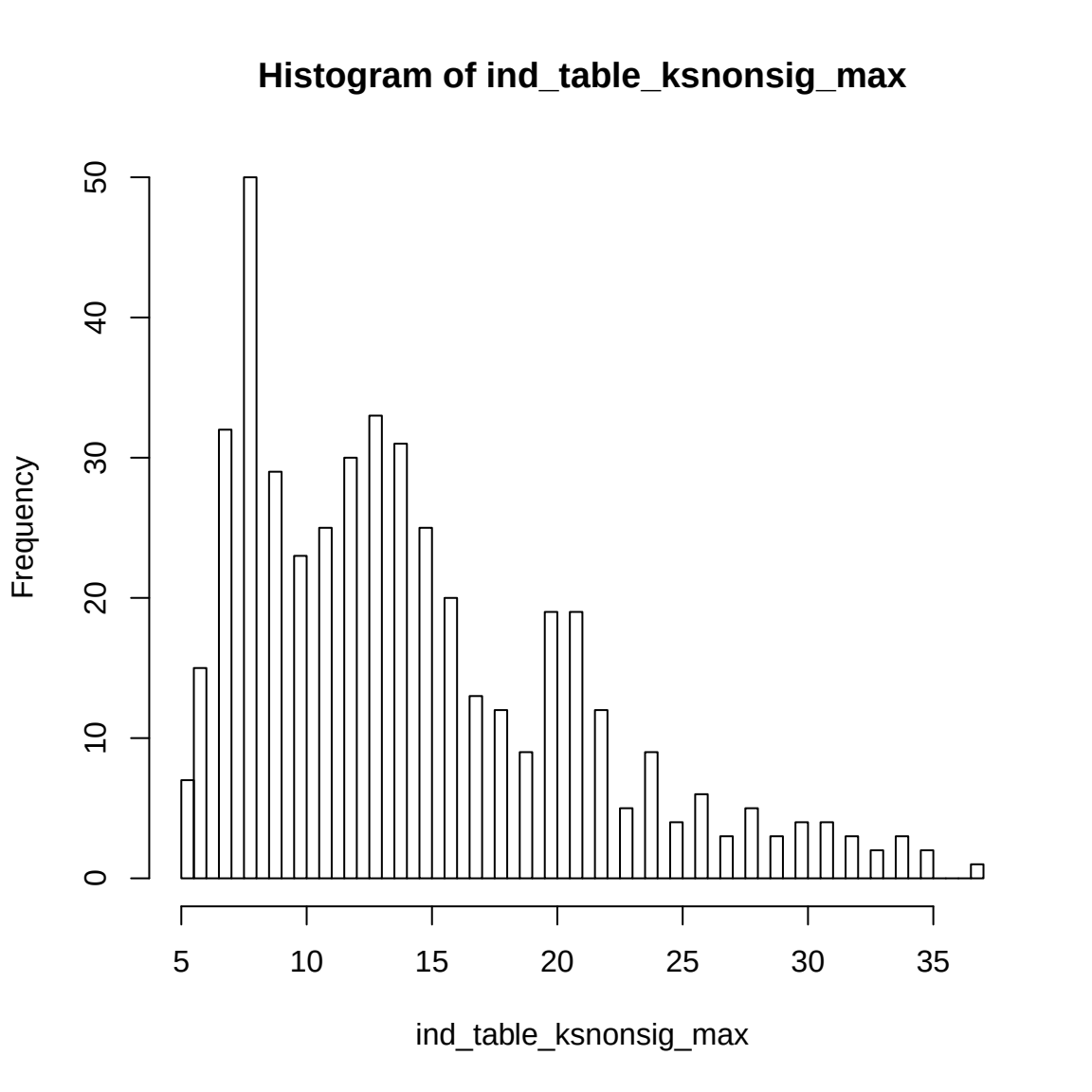

Histogram of ind_table_ksless_sd
Frequency
0
1
2
3
4
5
2
3
4
5
6
7
8
ind_table_ksless_sd


Histogram of ind_table_ksnonsig_sd
Frequency
0
5
10
15
20
25
30
2
4
6
8
ind_table_ksnonsig_sd


Histogram of ind_table_ksless_skewness
Frequency
0
2
4
6
8
0.5
1.0
1.5
2.0
ind_table_ksless_skewness


Histogram of ind_table_ksnonsig_skewness
Frequency
0
5
10
15
20
25
30
35
0.5
1.0
1.5
2.0
ind_table_ksnonsig_skewness


Histogram of ind_table_ksless_max
Frequency
0
2
4
6
8
10
5
10
15
20
25
30
35
ind_table_ksless_max


Histogram of ind_table_ksnonsig_max
Frequency
0
10
20
30
40
50
5
10
15
20
25
30
35
ind_table_ksnonsig_max