Fig. S1

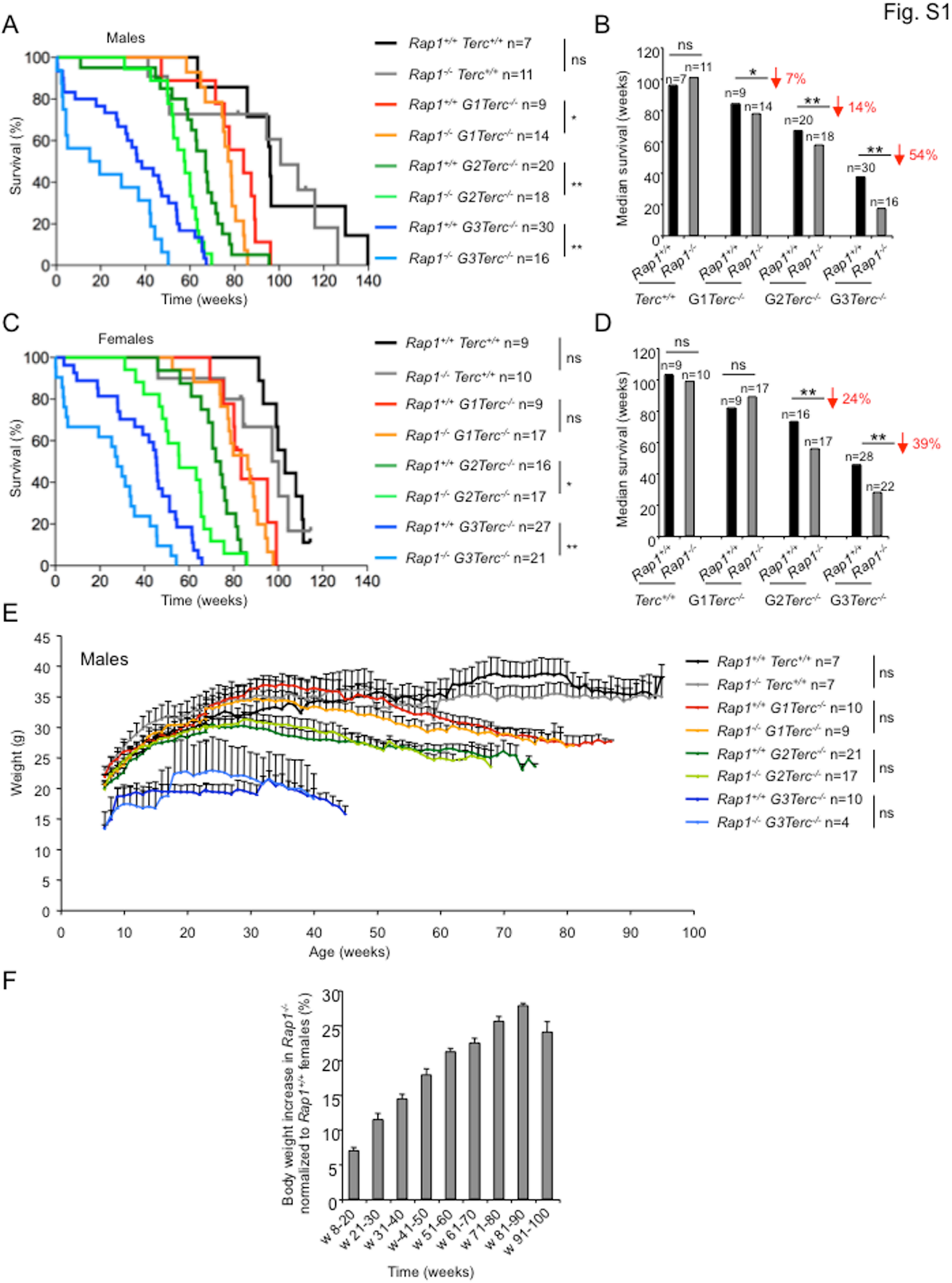
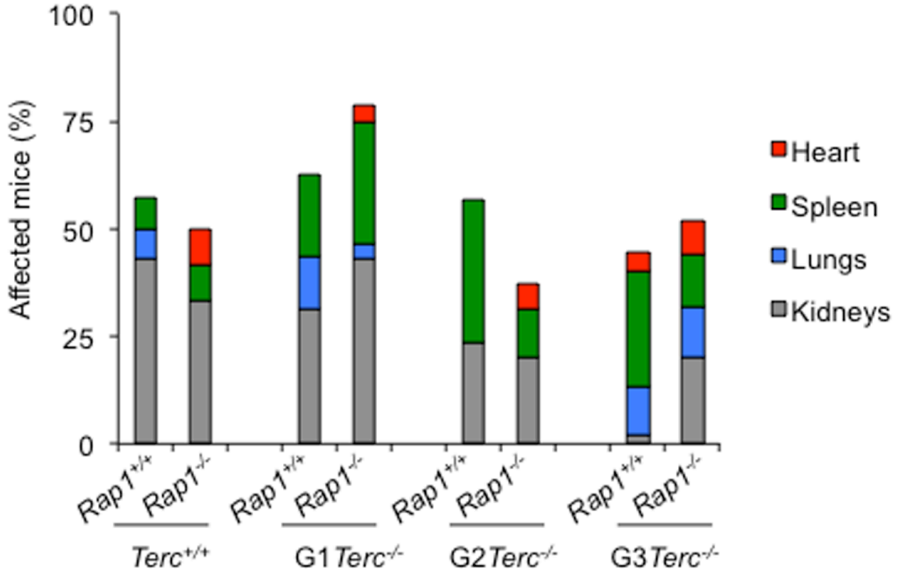
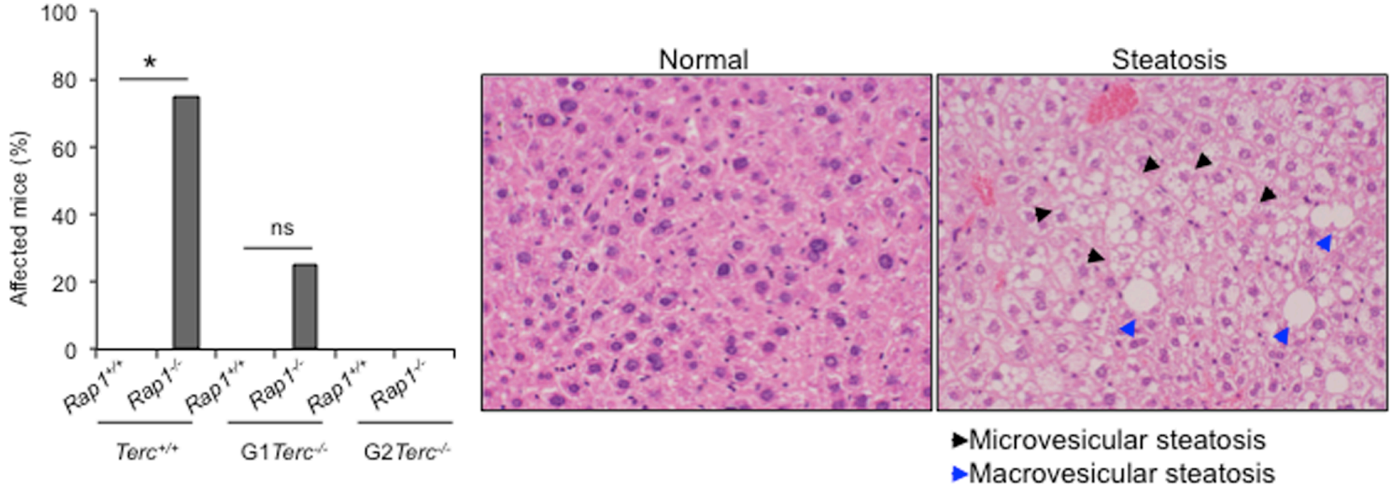

A
Males
Survival (%)
Time (weeks)
Rap1+/+ Terc+/+ n=7
Rap1-/- Terc+/+ n=11
Rap1+/+ G1Terc-/- n=9
Rap1-/- G1Terc-/- n=14
Rap1+/+ G2Terc-/- n=20
Rap1-/- G2Terc-/- n=18
Rap1+/+ G3Terc-/- n=30
Rap1-/- G3Terc-/- n=16
ns
*
**
**
B
Median survival (weeks)
ns
n=7
n=11
*
7%
n=9
n=14
**
14%
n=20
n=18
**
54%
n=30
n=16
Rap1+/+
Rap1-/-
Terc+/+
G1Terc-/-
G2Terc-/-
G3Terc-/-
C
Females
Survival (%)
Time (weeks)
Rap1+/+ Terc+/+ n=9
Rap1-/- Terc+/+ n=10
Rap1+/+ G1Terc-/- n=9
Rap1-/- G1Terc-/- n=17
Rap1+/+ G2Terc-/- n=16
Rap1-/- G2Terc-/- n=17
Rap1+/+ G3Terc-/- n=27
Rap1-/- G3Terc-/- n=21
ns
ns
*
**
D
Median survival (weeks)
ns
n=9
n=10
ns
n=9
n=17
**
24%
n=16
n=17
**
39%
n=28
n=22
Rap1+/+
Rap1-/-
Terc+/+
G1Terc-/-
G2Terc-/-
G3Terc-/-
E
Males
Weight (g)
Age (weeks)
Rap1+/+ Terc+/+ n=7
Rap1-/- Terc+/+ n=7
Rap1+/+ G1Terc-/- n=10
Rap1-/- G1Terc-/- n=9
Rap1+/+ G2Terc-/- n=21
Rap1-/- G2Terc-/- n=17
Rap1+/+ G3Terc-/- n=10
Rap1-/- G3Terc-/- n=4
ns
ns
ns
ns
F
Body weight increase in Rap1-/- normalized to Rap1+/+ females (%)
w 8-20
w 21-30
w 31-40
w-41-50
w 51-60
w 61-70
w 71-80
w 81-90
w 91-100
Time (weeks)

Fig. S2

A


Affected mice (%)
100
75
50
25
0
Heart
Spleen
Lungs
Kidneys
Rap1+/+
Rap1-/-
Terc+/+
G1 Terc-/-
G2 Terc-/-
G3 Terc-/-

B


Affected mice (%)
100
80
60
40
20
0
*
ns
Rap1+/+
Rap1-/-
Terc+/+
G1 Terc-/-
G2 Terc-/-
Normal
Steatosis
Microvesicular steatosis
Macrovesicular steatosis

C

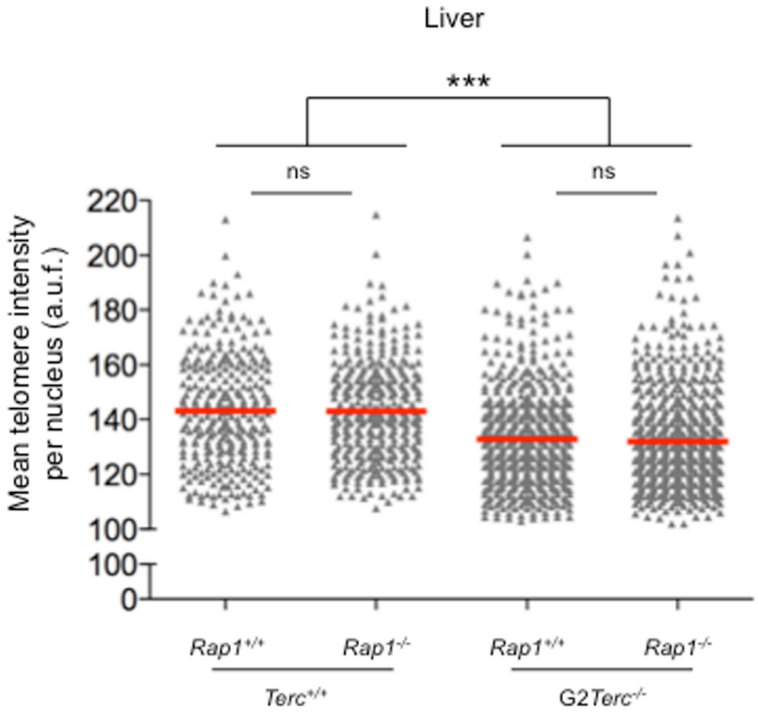
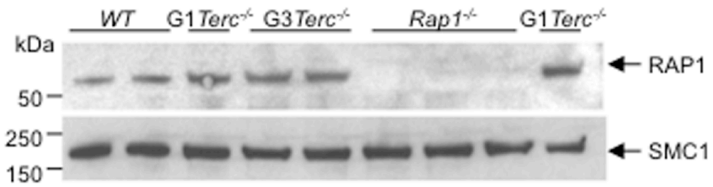
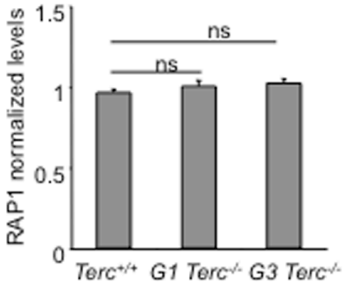

Liver
***
ns
ns
Mean telomere intensity per nucleus (a.u.f.)
220
200
180
160
140
120
100
100
0
Rap1+/+
Rap1-/-
Terc+/+
G2 Terc-/-

Fig. S3

A


WT
G1 Terc-/-
G3 Terc-/-
Rap1-/-
G1 Terc-/-
kDa
50
250
150
RAP1
SMC1


RAP1 normalized levels
1.5
1
0.5
0
ns
ns
Terc+/+
G1 Terc-/-
G3 Terc-/-

B

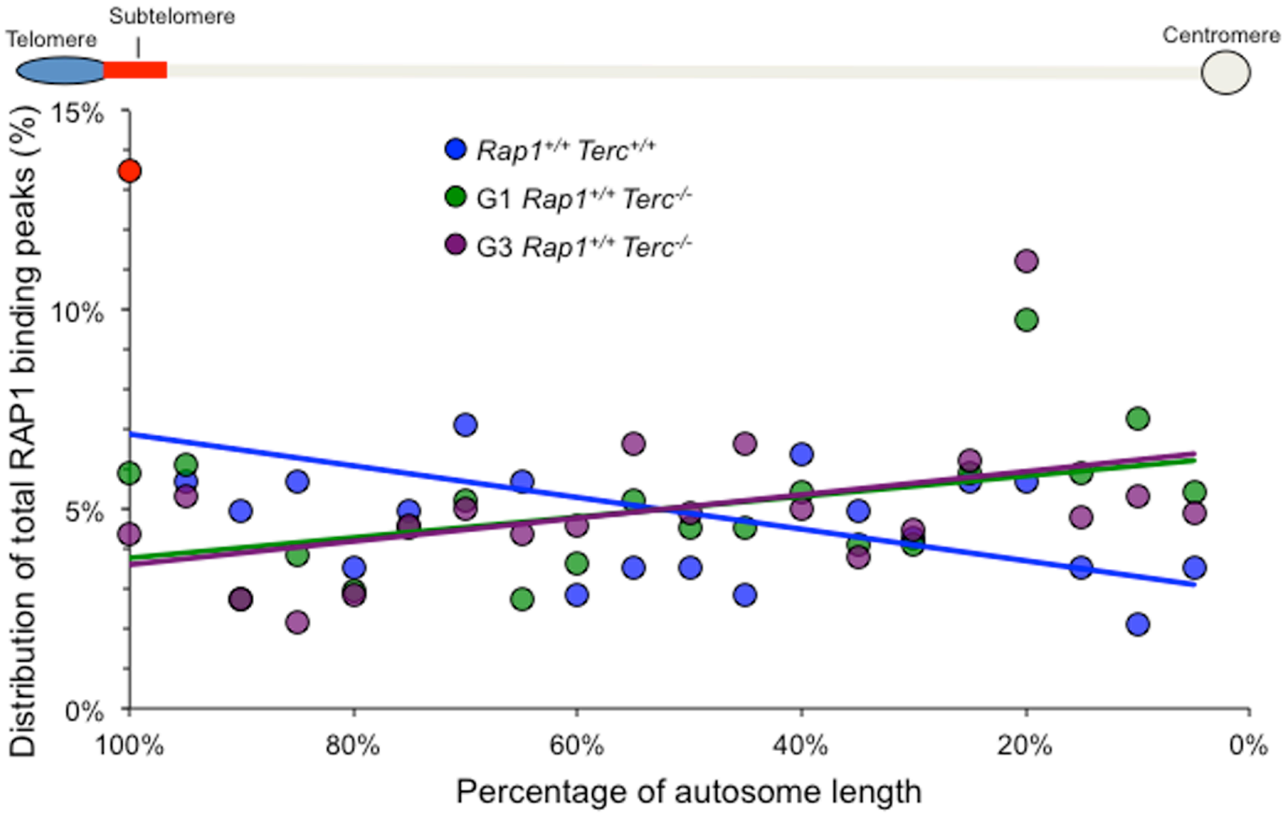
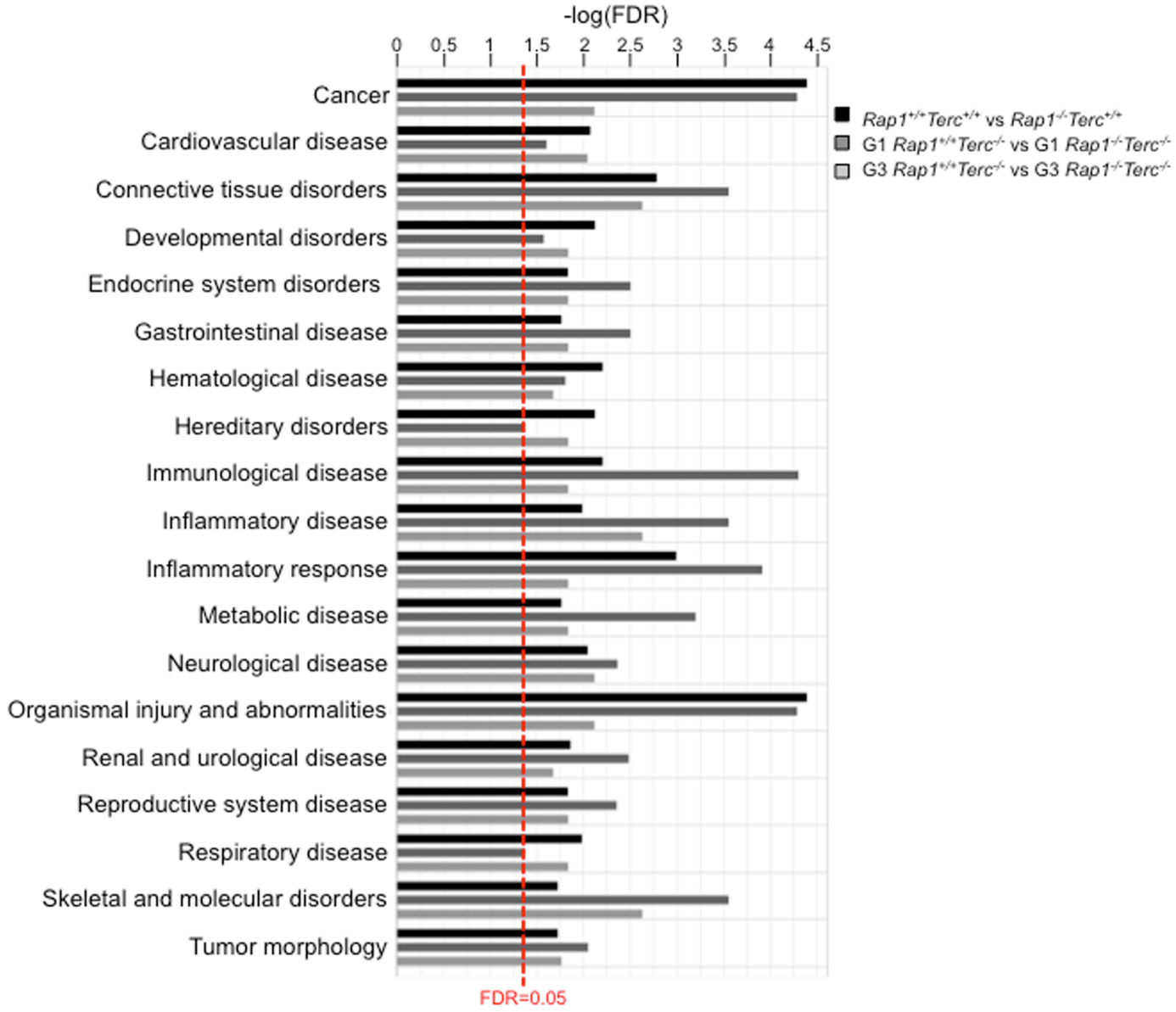

Telomere
Subtelomere
Centromere
Distribution of total RAP1 binding peaks (%)
15%
10%
5%
0%
Rap1+/+ Terc+/+
G1 Rap1+/+ Terc-/-
G3 Rap1+/+ Terc-/-
100%
80%
60%
40%
20%
0%
Percentage of autosome length

Fig S4.


-log(FDR)
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
Cancer
Cardiovascular disease
Connective tissue disorders
Developmental disorders
Endocrine system disorders
Gastrointestinal disease
Hematological disease
Hereditary disorders
Immunological disease
Inflammatory disease
Inflammatory response
Metabolic disease
Neurological disease
Organismal injury and abnormalities
Renal and urological disease
Reproductive system disease
Respiratory disease
Skeletal and molecular disorders
Tumor morphology
FDR=0.05
Rap1+/+Terc+/+ vs Rap1-/-Terc+/+
G1 Rap1+/+Terc-/- vs G1 Rap1-/-Terc-/-
G3 Rap1+/+Terc-/- vs G3 Rap1-/-Terc-/-