# Cohesin and condensin regulate chromosome topology and play an essential role in maintaining pluripotency in embryonic stem cells

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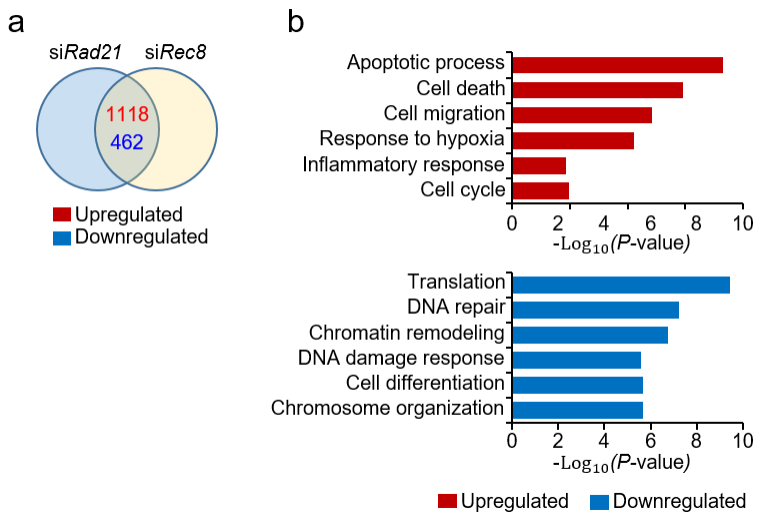



**Fig. S1. Gene expression profile of ES cell upon knocking down cohesin components.**

**a**. Venn diagram of all unique and common differentially expressed genes (DEGs) in si*Rad21*/siCtrl and si*Rec8*/siCtrl (fold change > 1.5 or < 0.7, P value < 0.01). **b**. Analyses of the DEGs were conducted using the DAVID database. Enriched biological themes, particularly gene ontology (GO) terms, were identified in both upregulated and downregulated genes. The upper red plot represents GO terms enriched in upregulated genes, while the blue plot depicts GO terms enriched in downregulated genes. *P*-values on the x-axis are presented as -Log10 (*P*-value).

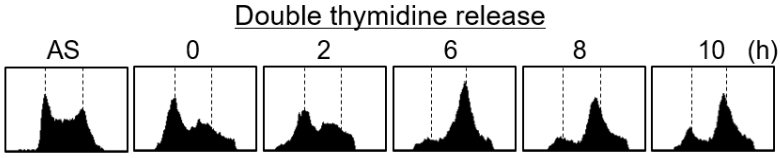



**Fig. S2. Cell cycle progression analysis in ES cells.**

FACS analysis showing cell cycle following G1 phase synchronization in ES cells. AS, asynchronous state.

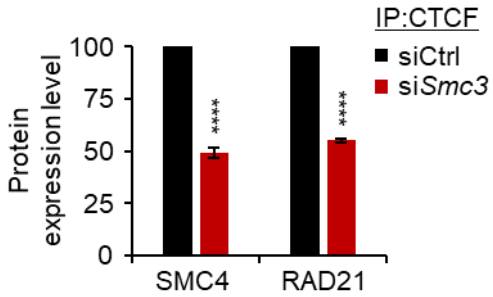
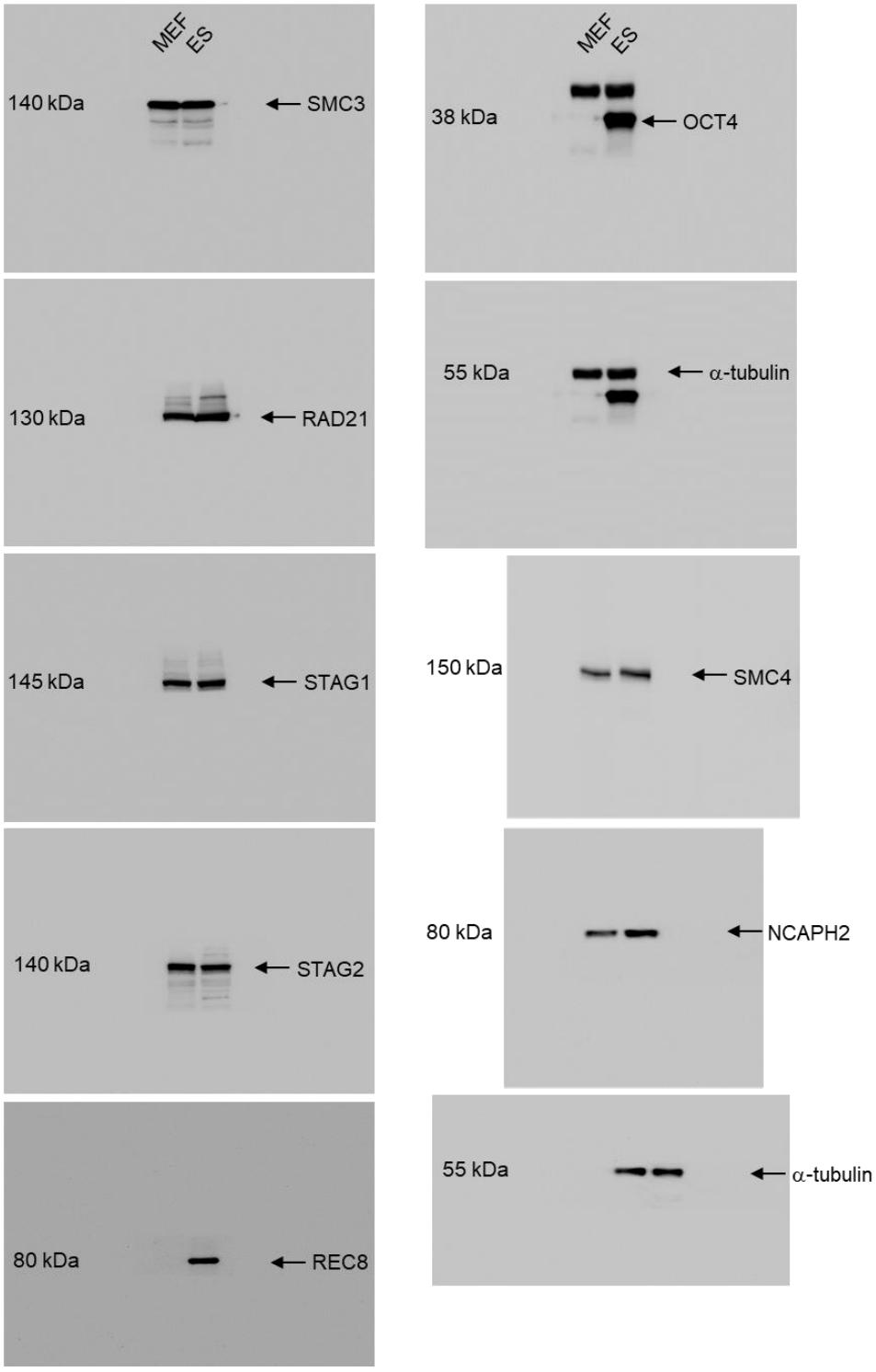



**Fig. S3. Analysis of protein expression changes in the absence of cohesin factor.**

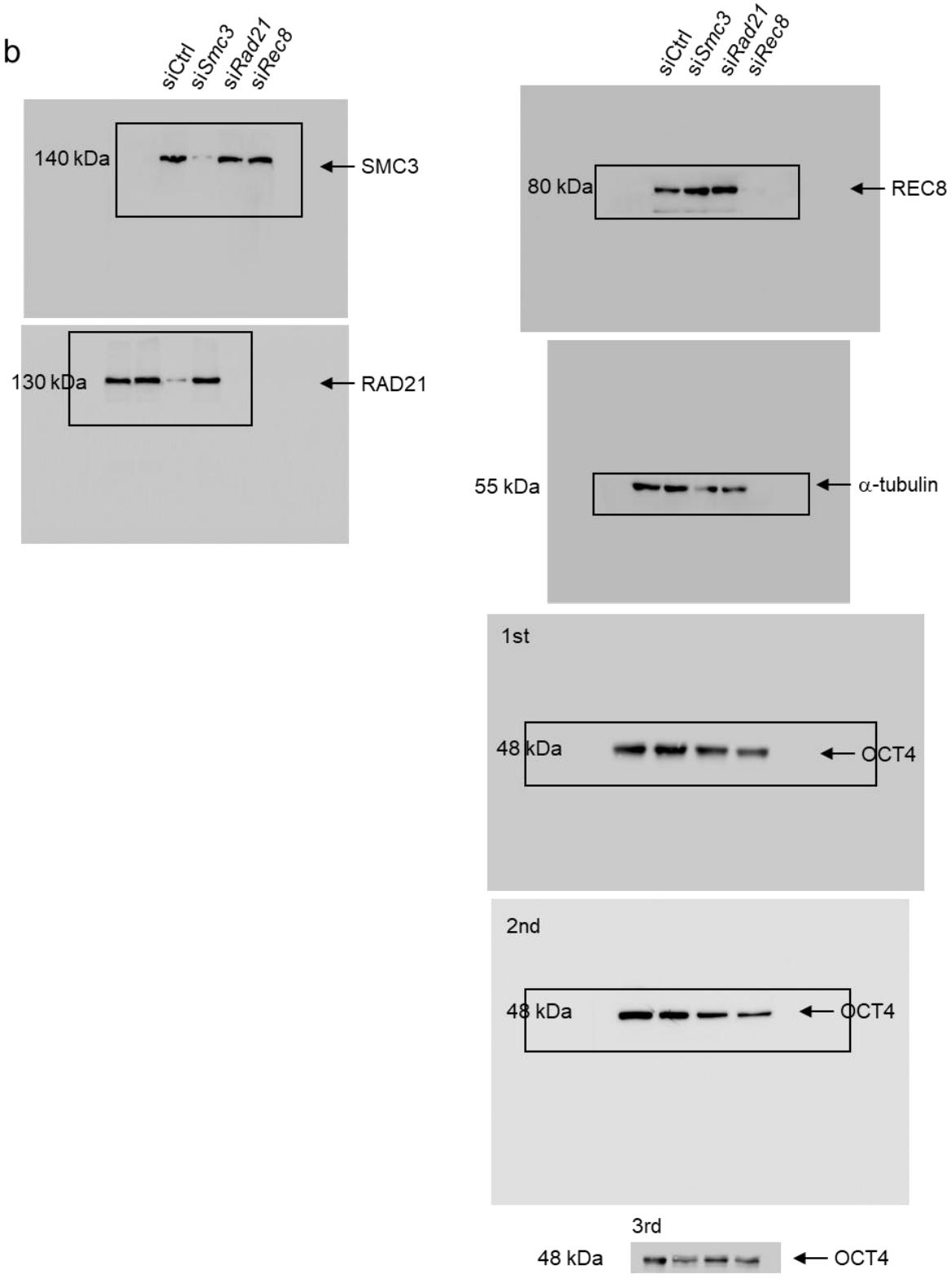
Quantification of SMC4 and RAD21 expression levels after SMC3 depletion. The error bars are the mean ± SD from the biological replicates.

# Uncropped western blot images

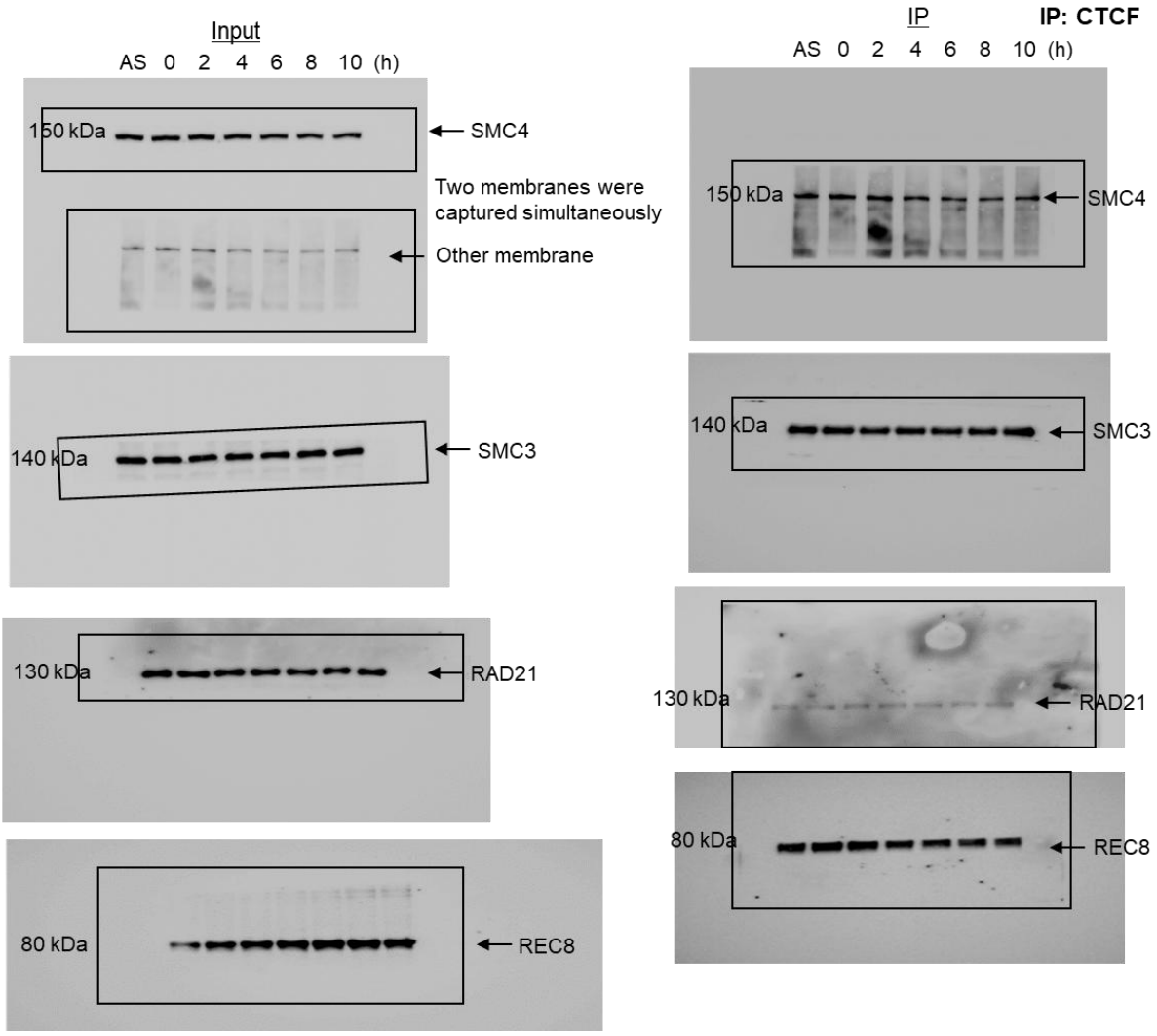
## For Figure 1



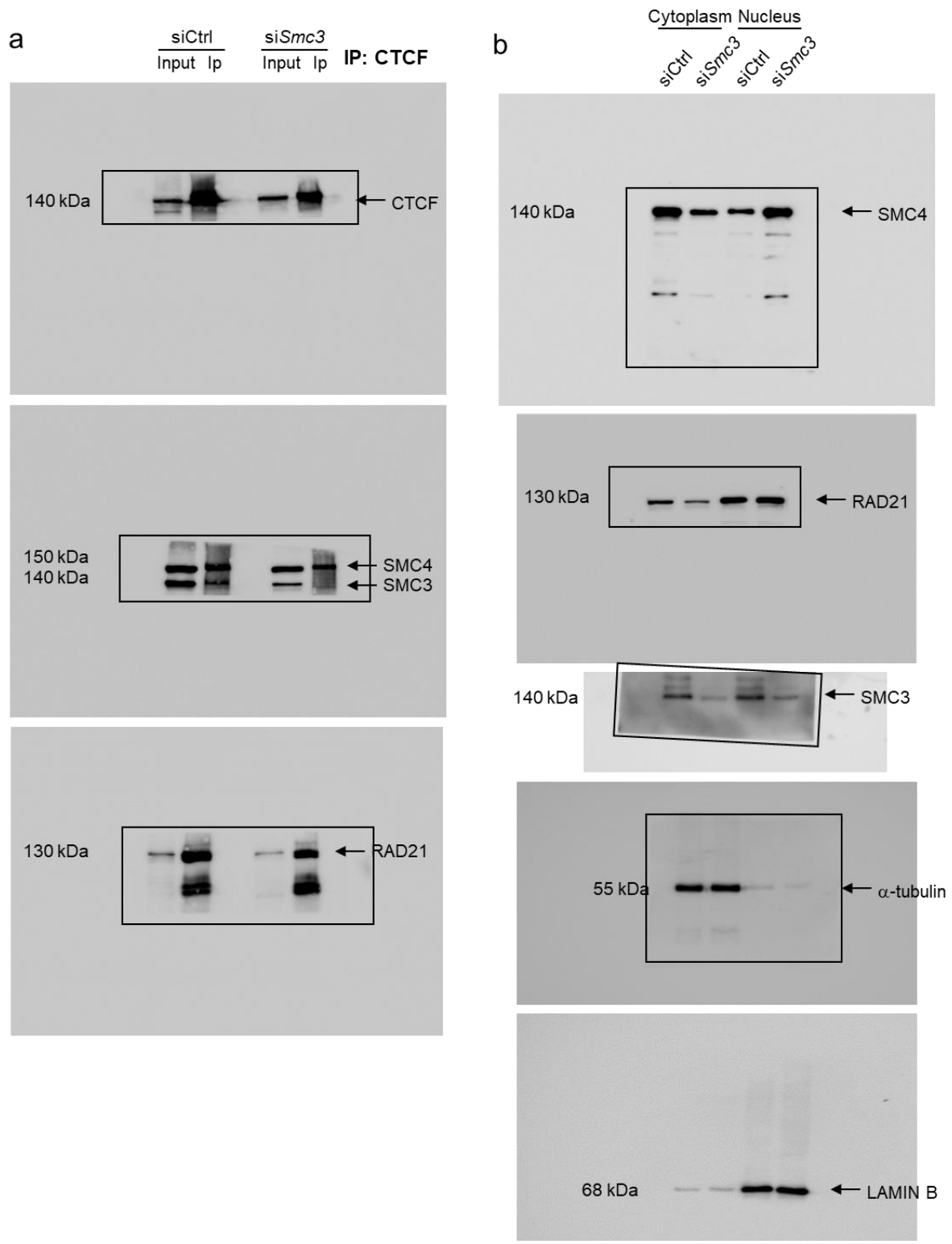
**For Figure 1**


b
siCtrl
siSmc3
siRad21
siRec8
140 kDa
SMC3
130 kDa
RAD21
80 kDa
REC8
55 kDa
α-tubulin
1st
48 kDa
OCT4
2nd
48 kDa
OCT4
3rd
48 kDa
OCT4

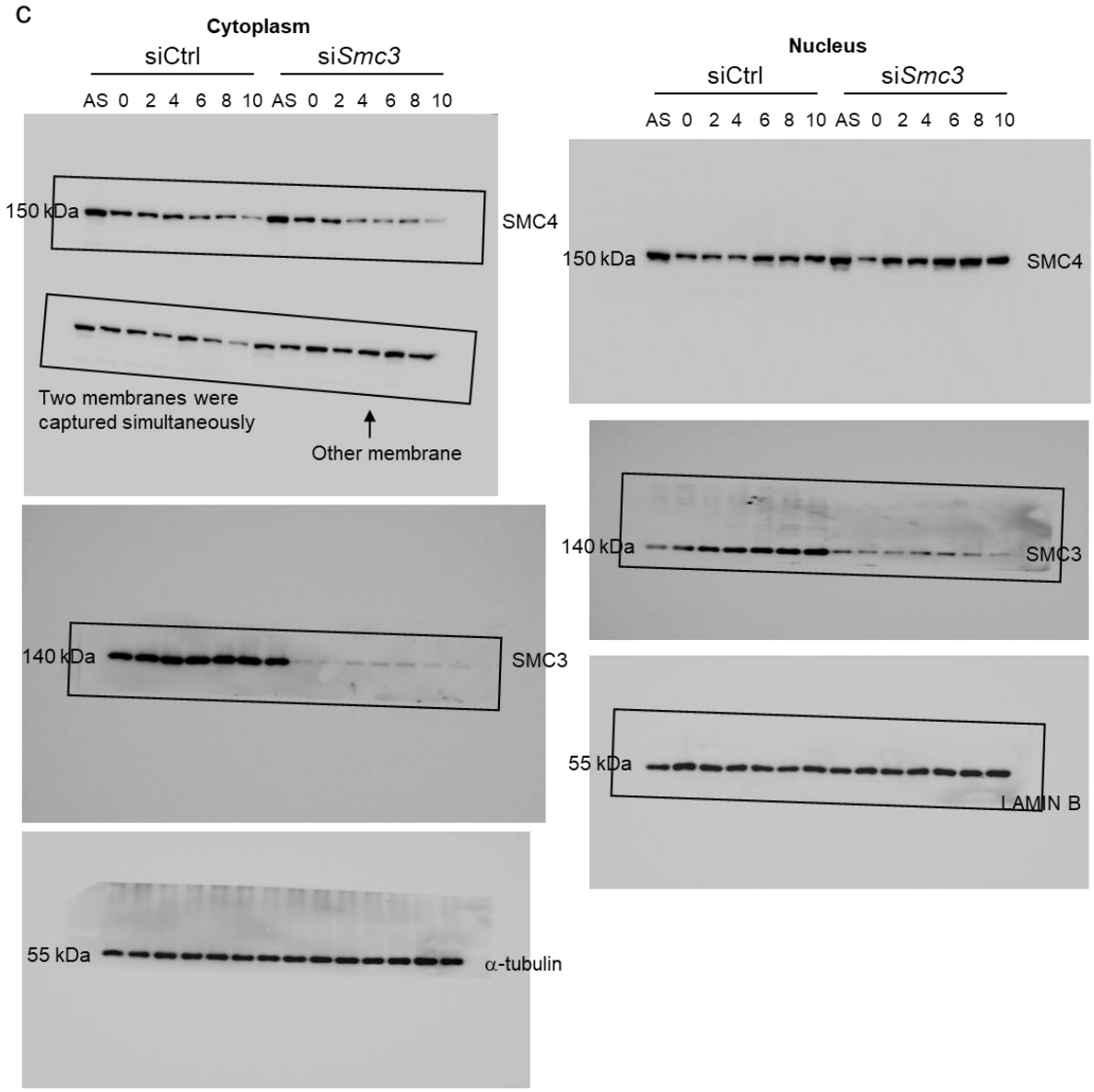
**For Figure 2**


Input
AS 0 2 4 6 8 10 (h)
150 kDa
SMC4
Two membranes were captured simultaneously
Other membrane
140 kDa
SMC3
130 kDa
RAD21
80 kDa
REC8
IP
IP: CTCF
AS 0 2 4 6 8 10 (h)
150 kDa
SMC4
140 kDa
SMC3
130 kDa
RAD21
80 kDa
REC8

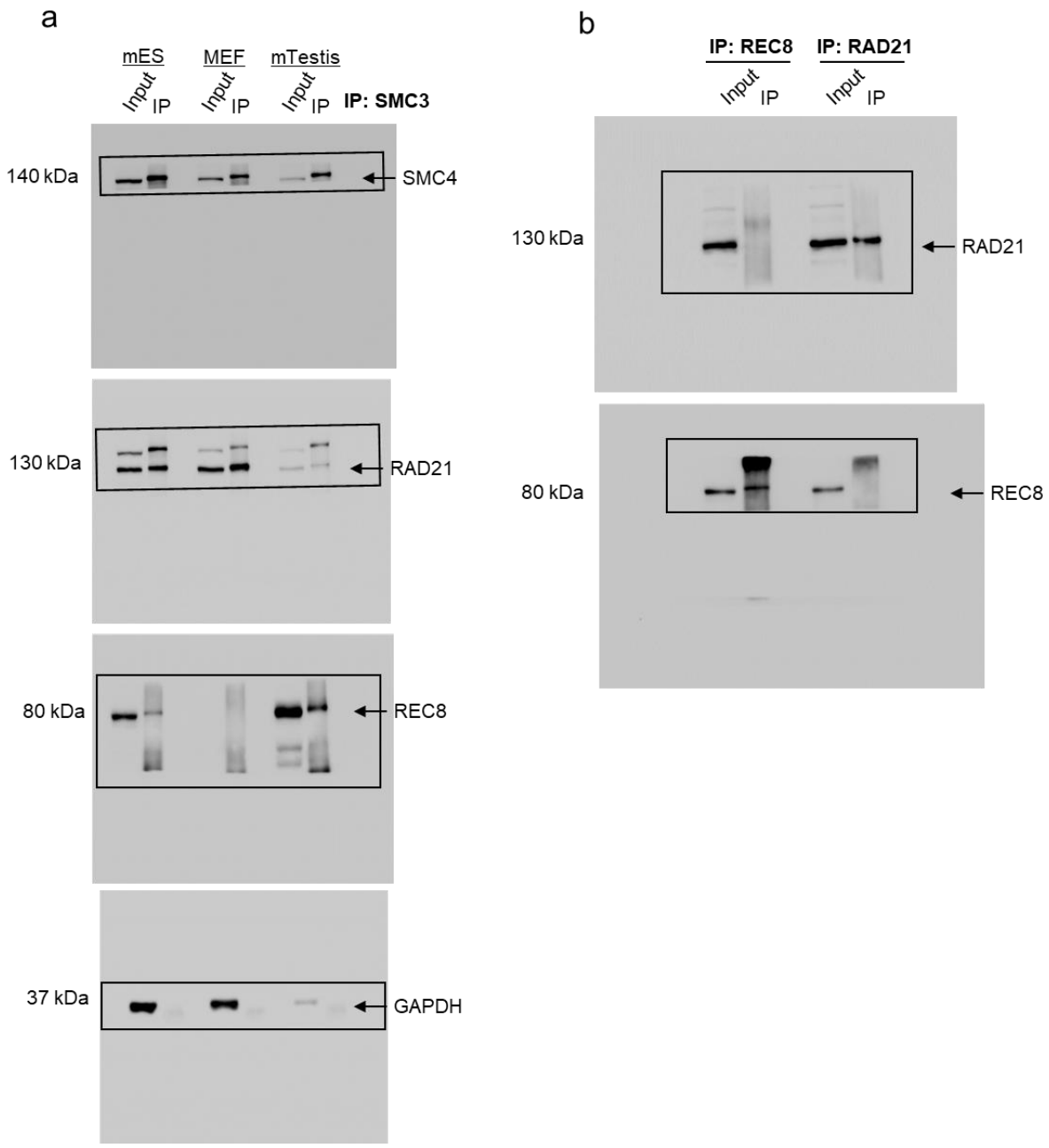
**For Figure 3**


a
siCtrl
Input Ip
siSmc3
Input Ip
IP: CTCF
140 kDa
CTCF
150 kDa
140 kDa
SMC4
SMC3
130 kDa
RAD21
b
Cytoplasm Nucleus
siCtrl
siSmc3
siCtrl
siSmc3
140 kDa
SMC4
130 kDa
RAD21
140 kDa
SMC3
55 kDa
α-tubulin
68 kDa
LAMIN B

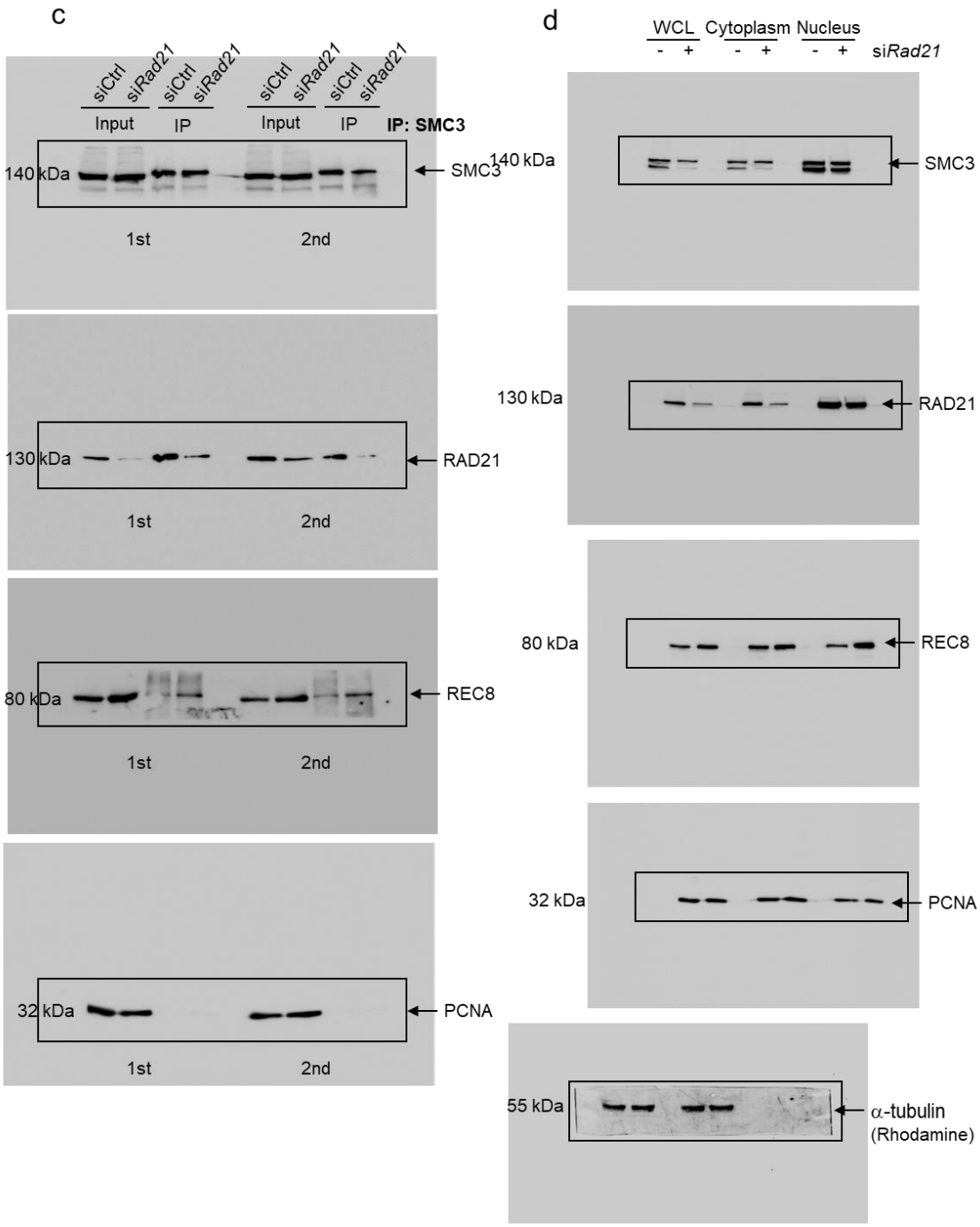
**For Figure 3**


C
Cytoplasm
siCtrl
siSmc3
AS 0 2 4 6 8 10 AS 0 2 4 6 8 10
150 kDa
SMC4
Two membranes were captured simultaneously
Other membrane
140 kDa
SMC3
55 kDa
α-tubulin
Nucleus
siCtrl
siSmc3
AS 0 2 4 6 8 10 AS 0 2 4 6 8 10
150 kDa
SMC4
140 kDa
SMC3
55 kDa
LAMIN B

**For Figure 4**


a
mES
MEF
mTestis
Input
IP
IP: SMC3
140 kDa
SMC4
130 kDa
RAD21
80 kDa
REC8
37 kDa
GAPDH
b
IP: REC8
IP: RAD21
Input
IP
130 kDa
RAD21
80 kDa
REC8

**For Figure 4**


c
siCtrl
siRad21
siCtrl
siRad21
siCtrl
siRad21
siCtrl
siRad21
Input
IP
Input
IP
IP: SMC3
140 kDa
SMC3
1st
2nd
130 kDa
RAD21
1st
2nd
80 kDa
REC8
1st
2nd
32 kDa
PCNA
1st
2nd
d
WCL
Cytoplasm
Nucleus
- + - + - +
siRad21
140 kDa
SMC3
130 kDa
RAD21
80 kDa
REC8
32 kDa
PCNA
55 kDa
α-tubulin
(Rhodamine)