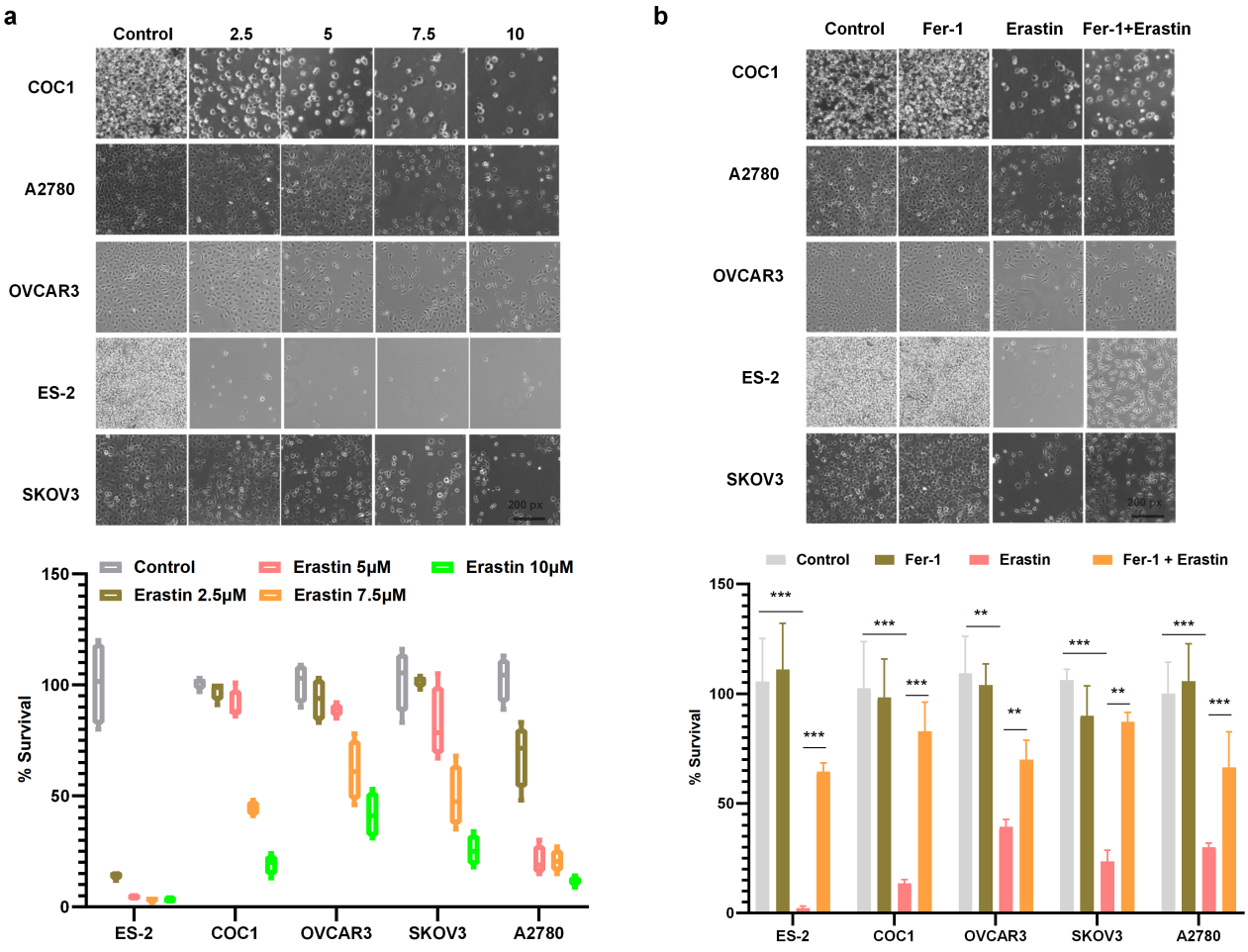
Supplementary Table 1: Description of Ovarian Cancer Tissue Samples

Patient number	Age	Pathological diagnosis	FIGO stage	p53	Experimental Study
1	42	High grade serous carcinoma of ovary and fallopian tube	IIa	Missense mutant	qRT-PCR, IHC
2	70	High grade serous carcinoma of ovary and fallopian tube	IIIc	Missense mutant	qRT-PCR, IHC
3	73	High grade serous carcinoma of ovary and fallopian tube	IIIc	Missense mutant	qRT-PCR, IHC
4	56	High grade serous carcinoma of ovary and fallopian tube	IVB	Nonsense mutant	qRT-PCR, IHC
5	67	High grade serous carcinoma of ovary and fallopian tube	IIIB	Missense mutant	qRT-PCR, IHC
6	50	High grade serous carcinoma of ovary	IA	Missense mutant	qRT-PCR, IHC
7	54	High grade serous carcinoma of ovary and fallopian tube	IIIc	Missense mutant	qRT-PCR, IHC
8	51	High grade serous carcinoma of ovary	IIB	Wild type	MDA, Fe^{2+}, GSH/GSSG
9	58	High grade serous carcinoma of ovary and fallopian tube	IIA	Nonsense mutant	MDA, Fe^{2+}, GSH/GSSG
10	58	High grade serous carcinoma of ovary and fallopian tube	IIIC	Missense mutant	MDA, Fe^{2+}, GSH/GSSG
11	64	High grade serous carcinoma of ovary and fallopian tube	IIIC	Missense mutant	MDA, Fe^{2+}, GSH/GSSG
12	47	High grade serous carcinoma of ovary and fallopian tube	IC	Missense mutant	MDA, Fe^{2+}, GSH/GSSG
13	58	High grade serous carcinoma of ovary and fallopian tube	IC	Nonsense mutant	MDA, Fe^{2+}, GSH/GSSG
14	49	High grade serous carcinoma of ovary and fallopian tube	IIIC	Missense mutant	MDA, Fe^{2+}, GSH/GSSG
15	63	High grade serous carcinoma of ovary and fallopian tube	IV	Missense mutant	PDX

Supplementary Table 2: Clinical Profile of Patients Donating Normal Ovaries

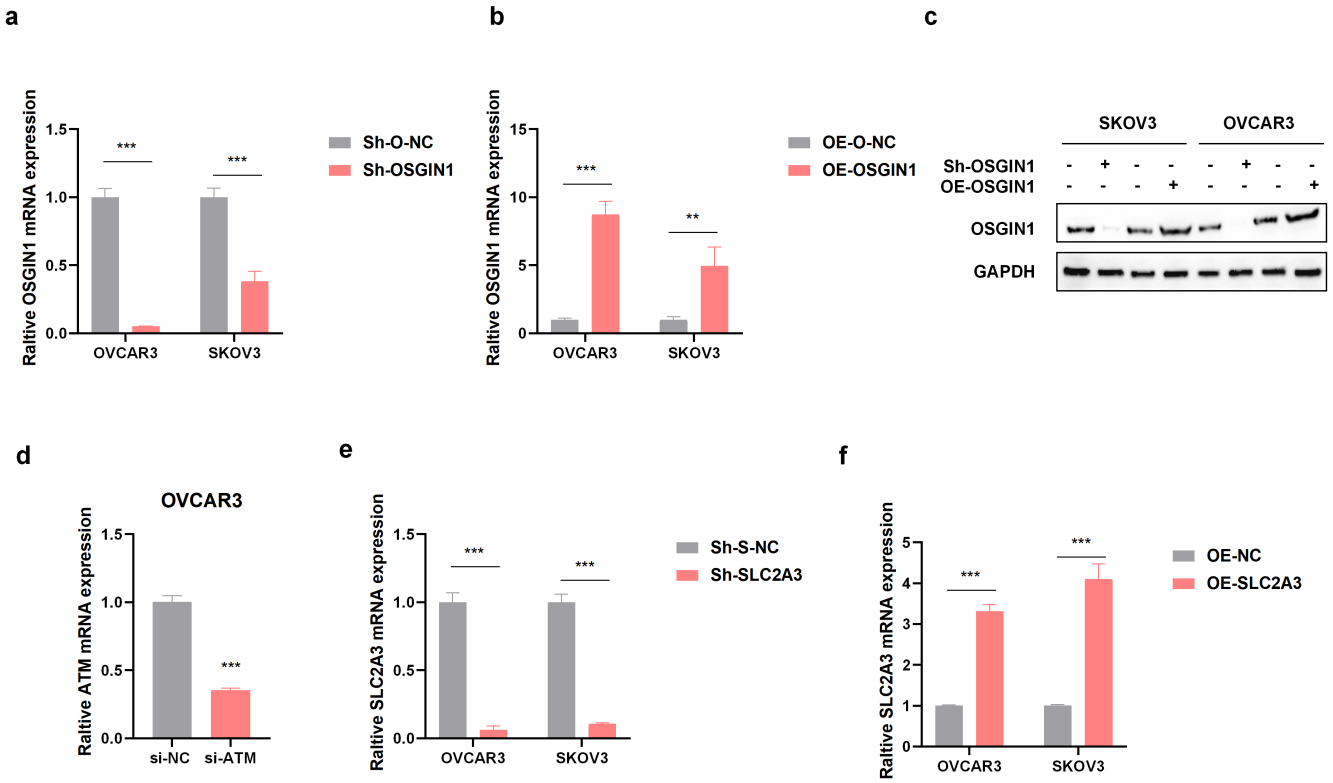
Patient /block number	Age (years)	Reason for surgery	Ovary diseases	Experimental Study
1	53	Fibroids	No	qRT-PCR, IHC
2	61	Cervical intraepithelial neoplasia III	No	qRT-PCR, IHC
3	60	Fibroids	No	qRT-PCR, IHC
4	58	Cervical intraepithelial neoplasia III	No	qRT-PCR, IHC
5	56	Fibroids	No	qRT-PCR, IHC
6	54	Fibroids	No	qRT-PCR, IHC
7	56	Fibroids	No	qRT-PCR, IHC
8	57	Fibroids	No	MDA, Fe^{2+}, GSH/GSSG
9	61	Fibroids	No	MDA, Fe^{2+}, GSH/GSSG
10	59	Cervical intraepithelial neoplasia III	No	MDA, Fe^{2+}, GSH/GSSG
11	56	Cervical intraepithelial neoplasia III	No	MDA, Fe^{2+}, GSH/GSSG
12	67	Cervical intraepithelial neoplasia III	No	MDA, Fe^{2+}, GSH/GSSG
13	66	Cervical intraepithelial neoplasia II	No	MDA, Fe^{2+}, GSH/GSSG
14	55	Cervical squamous cell carcinoma stage IA2	No	MDA, Fe^{2+}, GSH/GSSG

Supplementary Figure 1



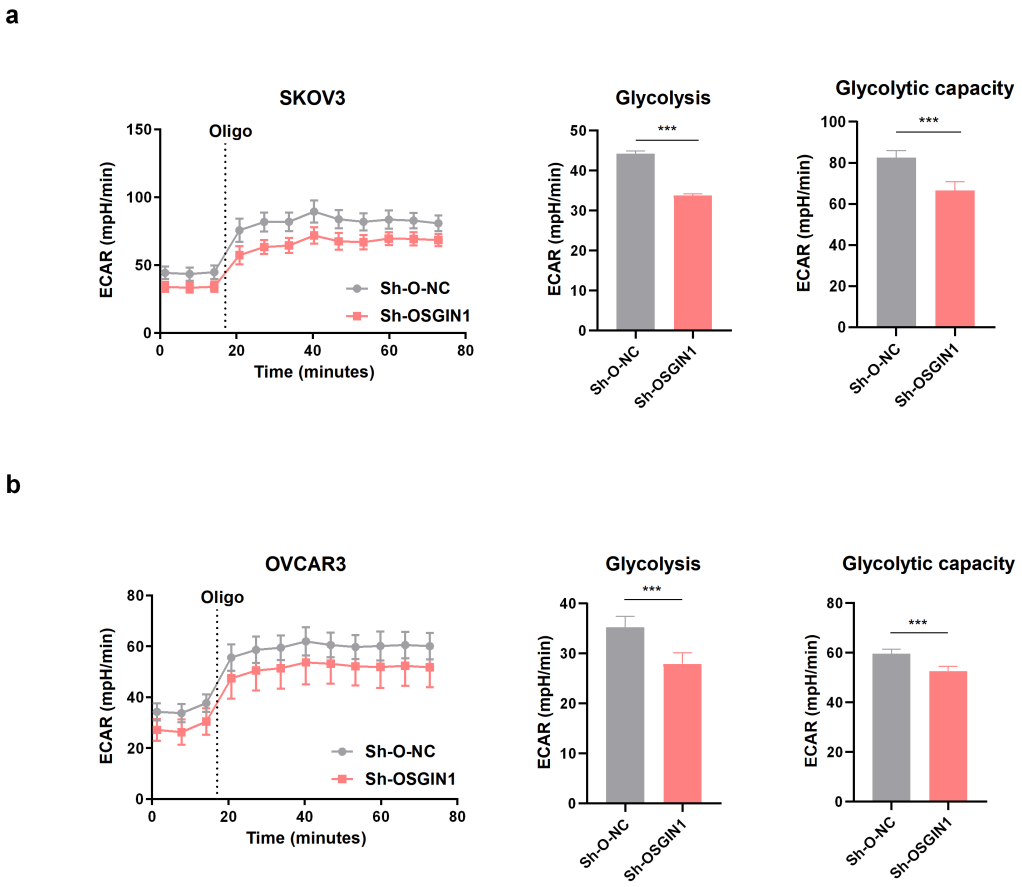
Supplementary Figure 1. Ferroptosis was occurred in erastin-treated ovarian cancer cells. a The effect of different concentrations (0, 2.5, 7.5, 10 μM) of erastin on cell viability as determined by CCK8 assay. b The viability of ES-2, COC1, OVCAR3, SKOV3 and A2780 cells treated with DMSO (control), erastin (10 μM), alone or in combination with fer-1(10 μM) were analyzed with the CCK8 assay. Each experiment was repeated three times. The p values in a-b were determined by two-way ANOVA with multiple comparisons. *$p < 0.05$; **$p < 0.01$ and ***$p < 0.001$.

Supplementary Figure 2



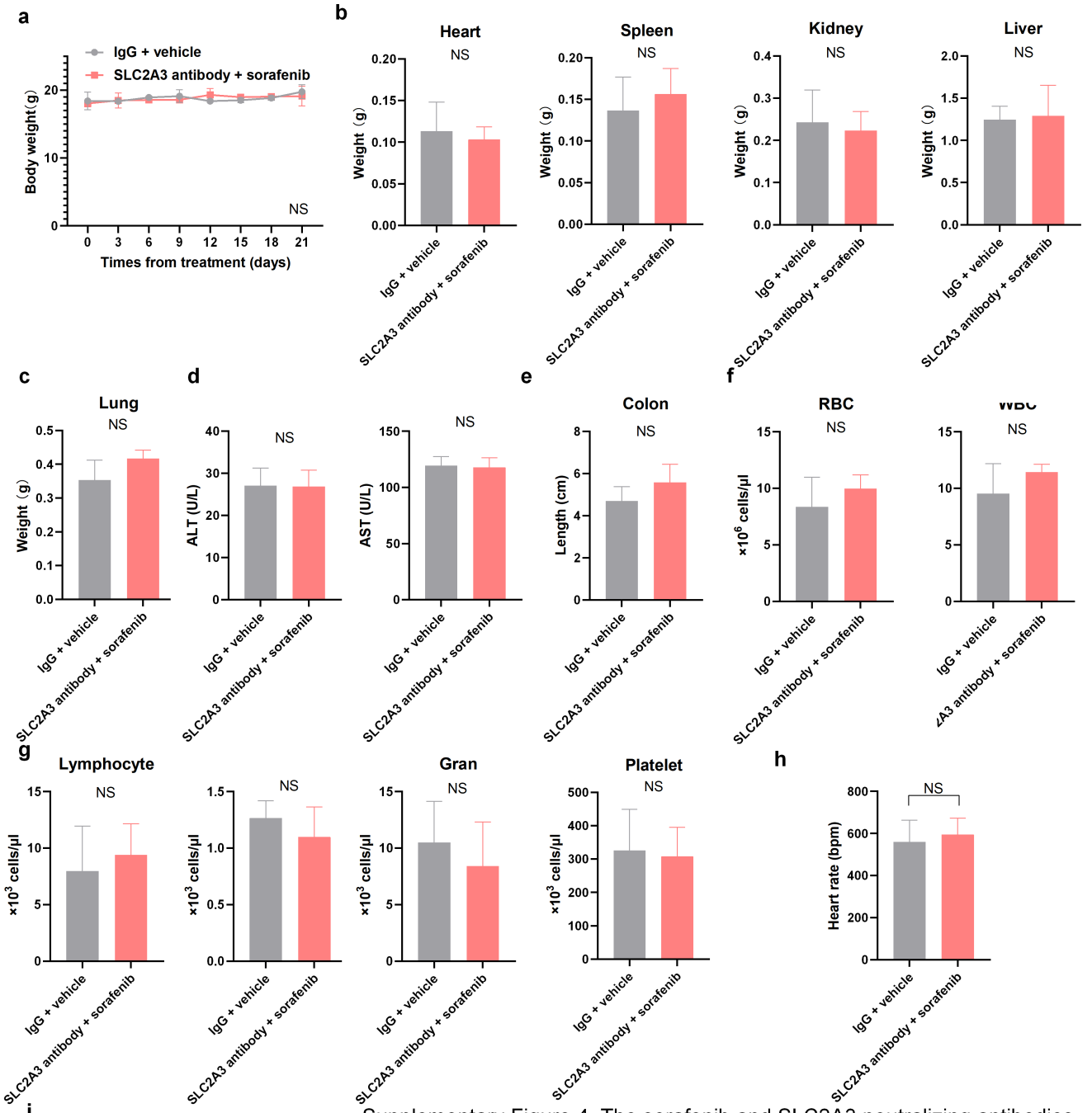
Supplementary Figure 2. Enhancing or reducing the efficiency of knocking down or overexpressing various genes. a-c The knock-down or overexpression efficiency of OSGIN1 was verified through western blot and qRT-PCR analysis. d The knock-down efficiency of ATM was verified through qRT-PCR analysis. e-f The knock-down or overexpression efficiency ofSLC2A3 was verified through qRT-PCR analysis. Each experiment was repeated three times. The p values in a-b and e-f were determined by one-way ANOVA with multiple comparisons. Statistical significance in d was determined by a two-tailed unpaired t-test. $^{**}p < 0.01$ and $^{***}p < 0.001$

Supplementary Figure 3



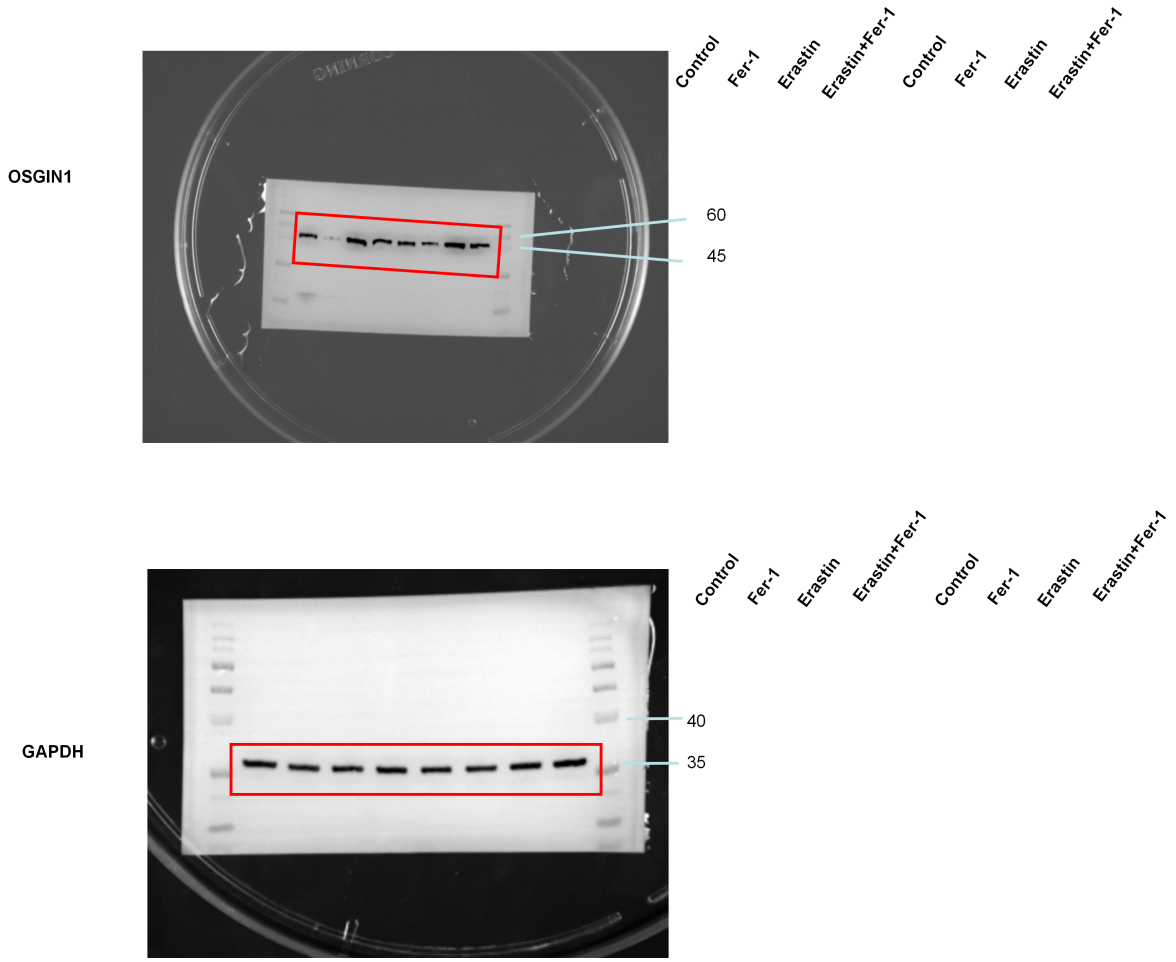
Supplementary Figure 3. ECAR (extracellular acidification rate) results for SKOV3 and OVCAR3 cells transfected with sh-O-NC or sh-OSGIN1 by using Seahorse XF96 analyzer. Glycolysis: ECAR values before the addition of oligomycin; Glycolytic capacity: ECAR values following addition of oligomycin. ***$p < 0.001$

Supplementary Figure 4



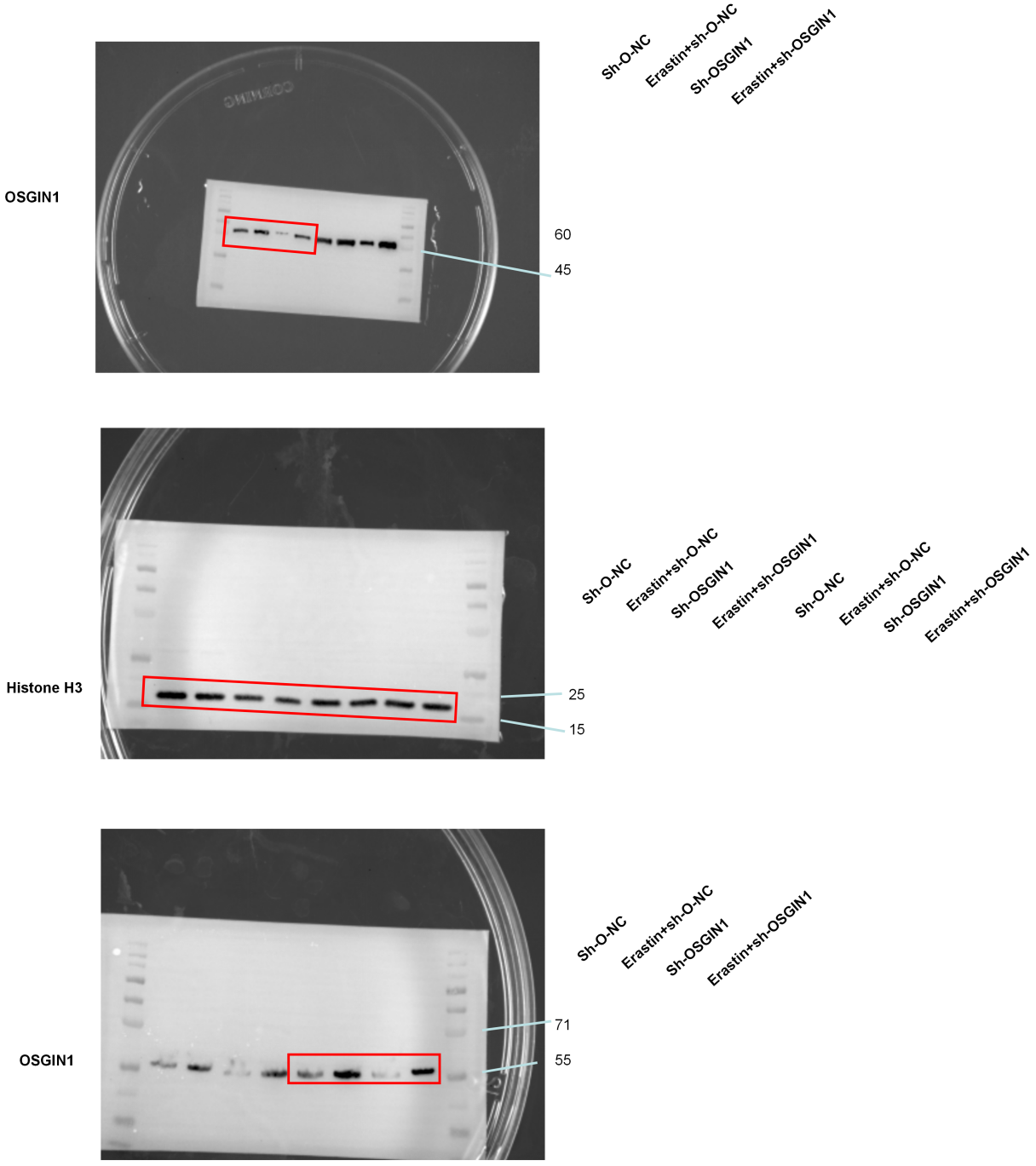
Supplementary Figure 4. The sorafenib and SLC2A3 neutralizing antibodies in combination has a good safety profile in NOD-SCID-IL2Rγc–/– mice. The sorafenib was administered at a dose of 30 mg/kg body weight via oral gavage once daily until day 21. Additionally, the SLC2A3-neutralizing antibody was administered once daily via intraperitoneal injection at a dose of 100 μg per mouse until day 21. And then euthanized for toxicity studies (n = 3). a Body weight change. b-c Heart, liver, spleen, lung, and kidney weights. d Serum concentrations of AST and ALT. e Colon length. f-g Whole blood counts of red blood cells (RBCs), white blood cells (WBCs), platelets, lymphocytes, monocytes and gran using a Mindray whole-cell blood analyzer. h Heart rate was measured 1 day after the final treatment. Bpm, beats per minute. i Blood pressure of mice was measured 1 day after the final treatment. D, M, and S represent diastolic, mean, and systolic blood pressure, respectively. The data are presented as the means ± SEMs and were analyzed by unpaired Student’ s t test. NS, $P > 0.05$.

Supplementary Figure 5



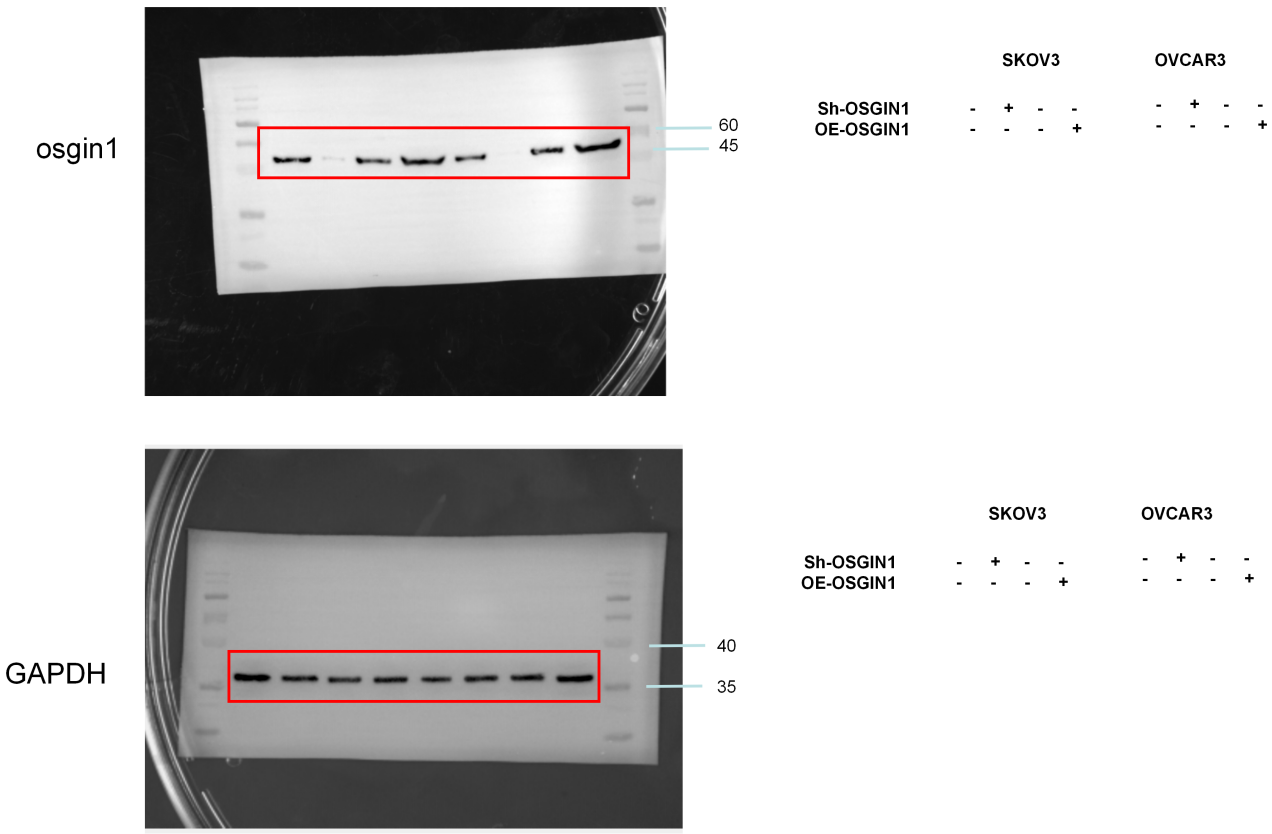
Supplementary Figure 5. Full-size blots of Figure 2d.

Supplementary Figure 6



Supplementary Figure 6. Full-size blots of Figure 3a.

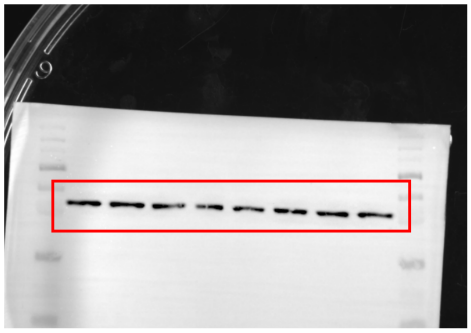
Supplementary Figure 7



Supplementary Figure 7. Full-size blots of Supplementary Figure 2c.

Supplementary Figure 8

t-AMPK



70
60

	SKOV3				OVCAR3			
Sh-OSGIN1	-	+	-	-	-	+	-	-
OE-OSGIN1	-	-	-	+	-	-	-	+

T-mTOR

180

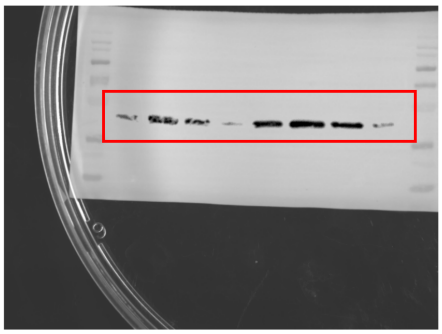
	SKOV3				OVCAR3			
Sh-OSGIN1	-	+	-	-	-	+	-	-
OE-OSGIN1	-	-	-	+	-	-	-	+

P-mTOR

180

	SKOV3				OVCAR3			
Sh-OSGIN1	-	+	-	-	-	+	-	-
OE-OSGIN1	-	-	-	+	-	-	-	+

SLC2A3



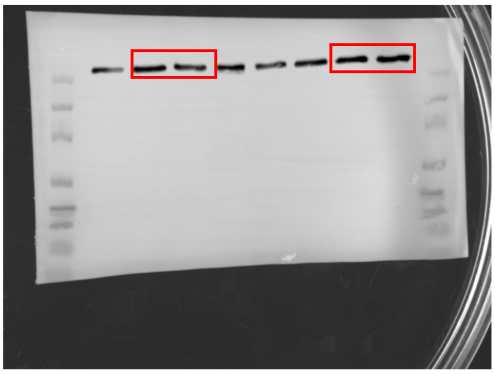
55
40

	SKOV3				OVCAR3			
Sh-OSGIN1	-	+	-	-	-	+	-	-
OE-OSGIN1	-	-	-	+	-	-	-	+

Supplementary Figure 8. Full-size blots of Figure 4d.

Supplementary Figure 9

t-mtor

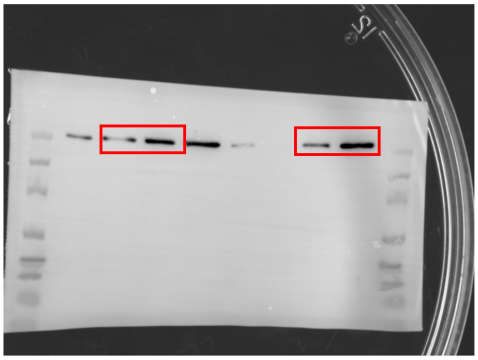


260

OVCAR3

AICAR	+	-	-	-
Compound C	-	-	-	+

p-mtor

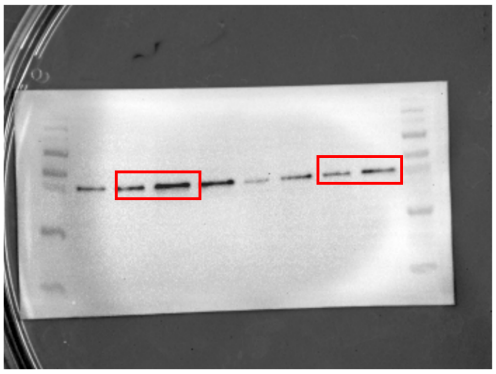


260

OVCAR3

AICAR	+	-	-	-
Compound C	-	-	-	+

SLC2A3

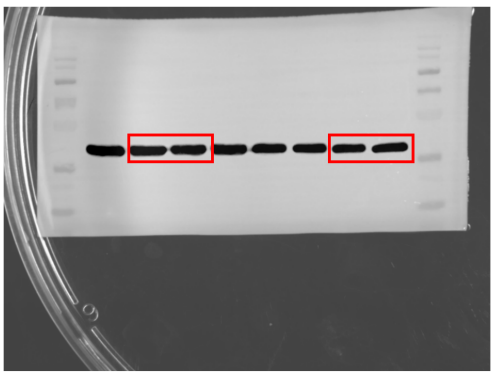


60
45

OVCAR3

AICAR	+	-	-	-
Compound C	-	-	-	+

GAPDH



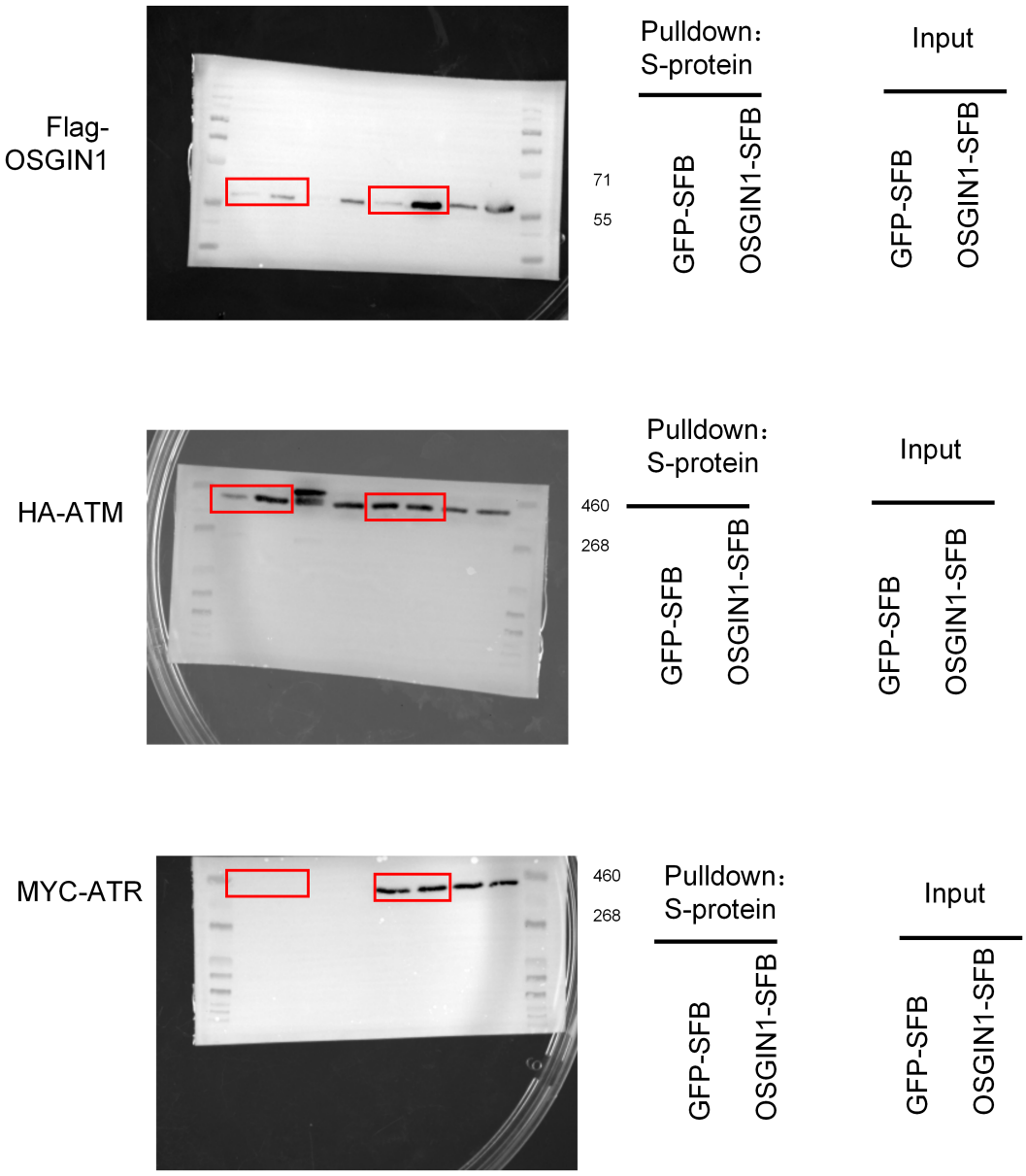
45
35

OVCAR3

AICAR	+	-	-	-
Compound C	-	-	-	+

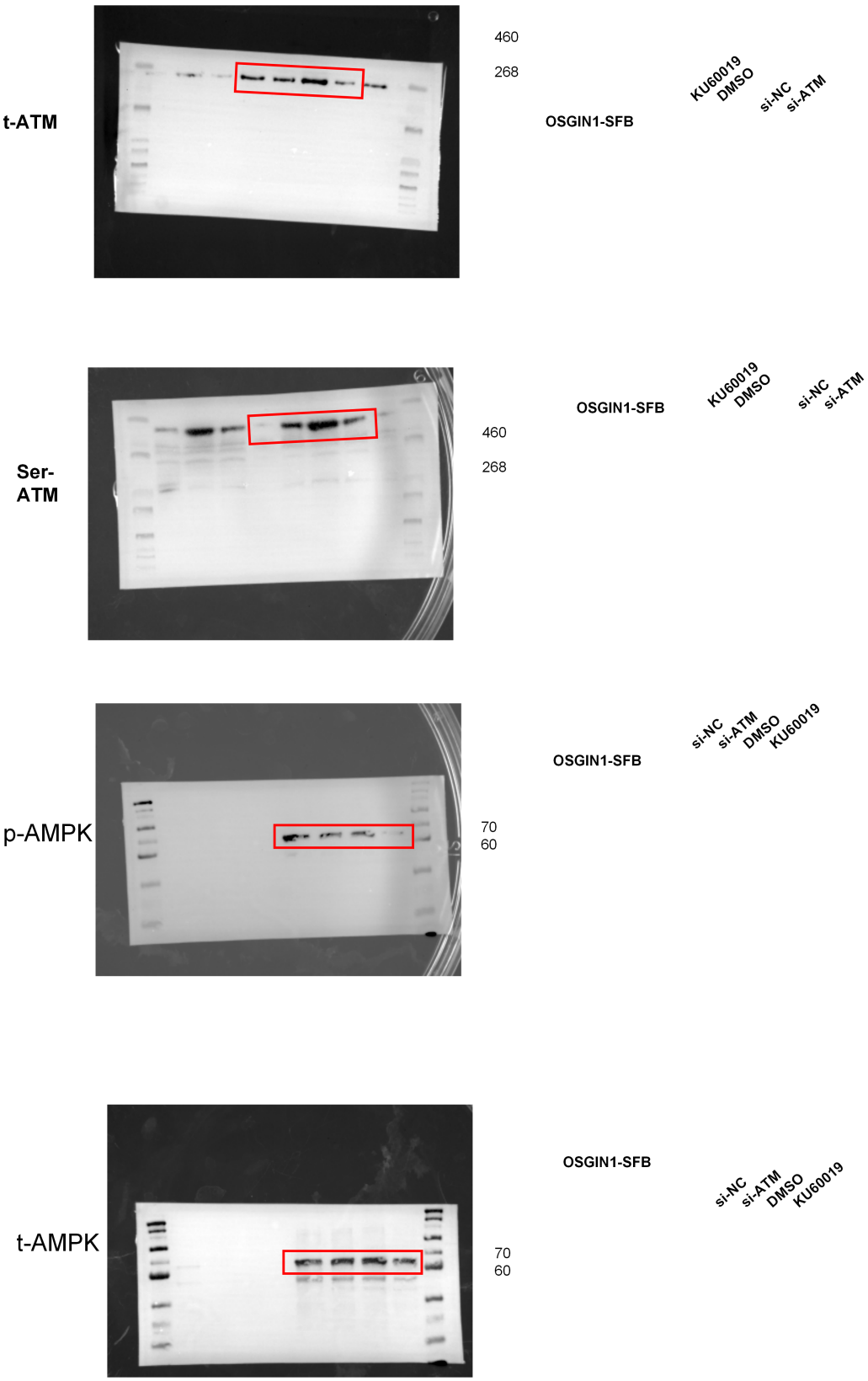
Supplementary Figure 9. Full-size blots of Figure 4g.

Supplementary Figure 10



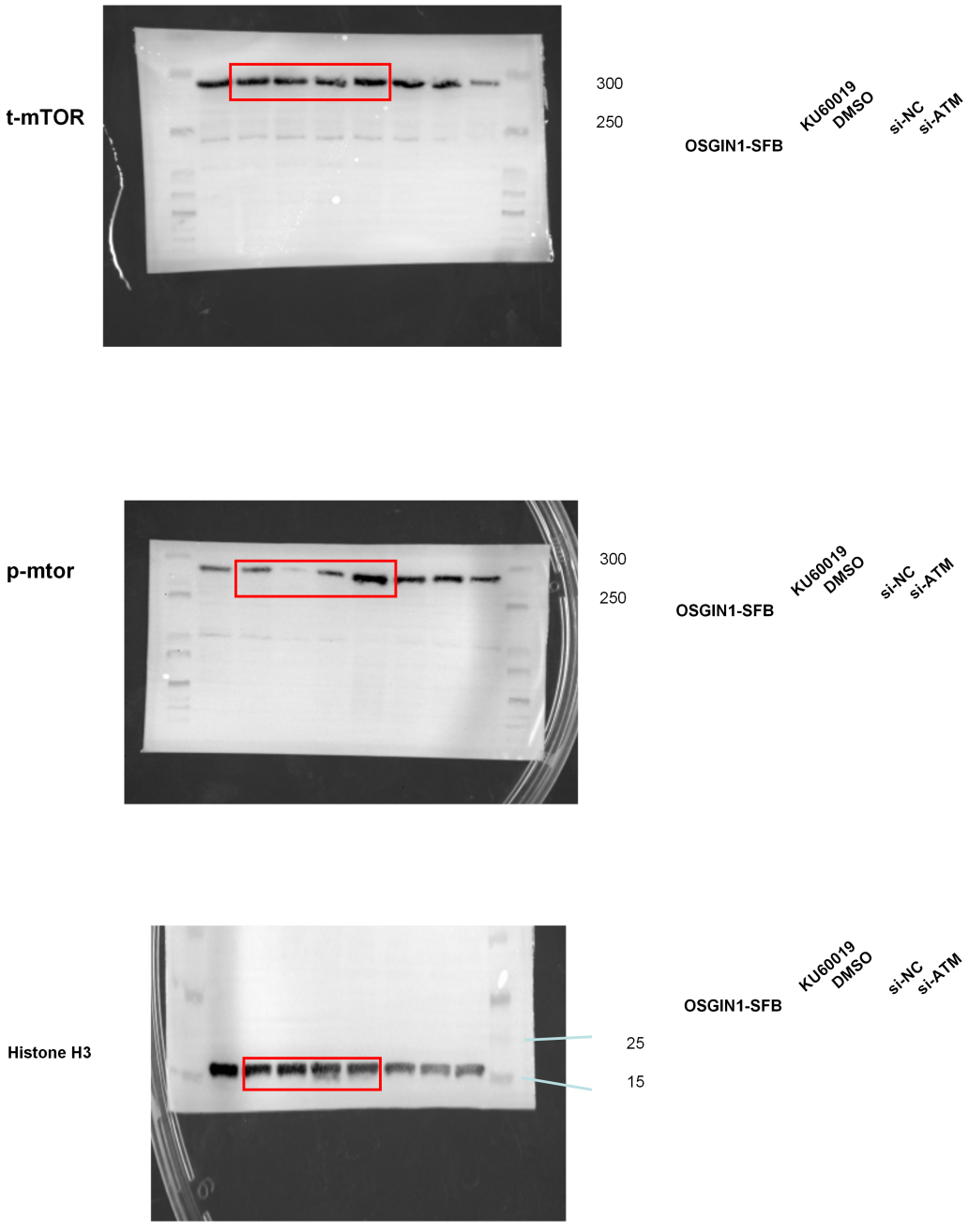
Supplementary Figure 10. Full-size blots of Figure 5a.

Supplementary Figure 11



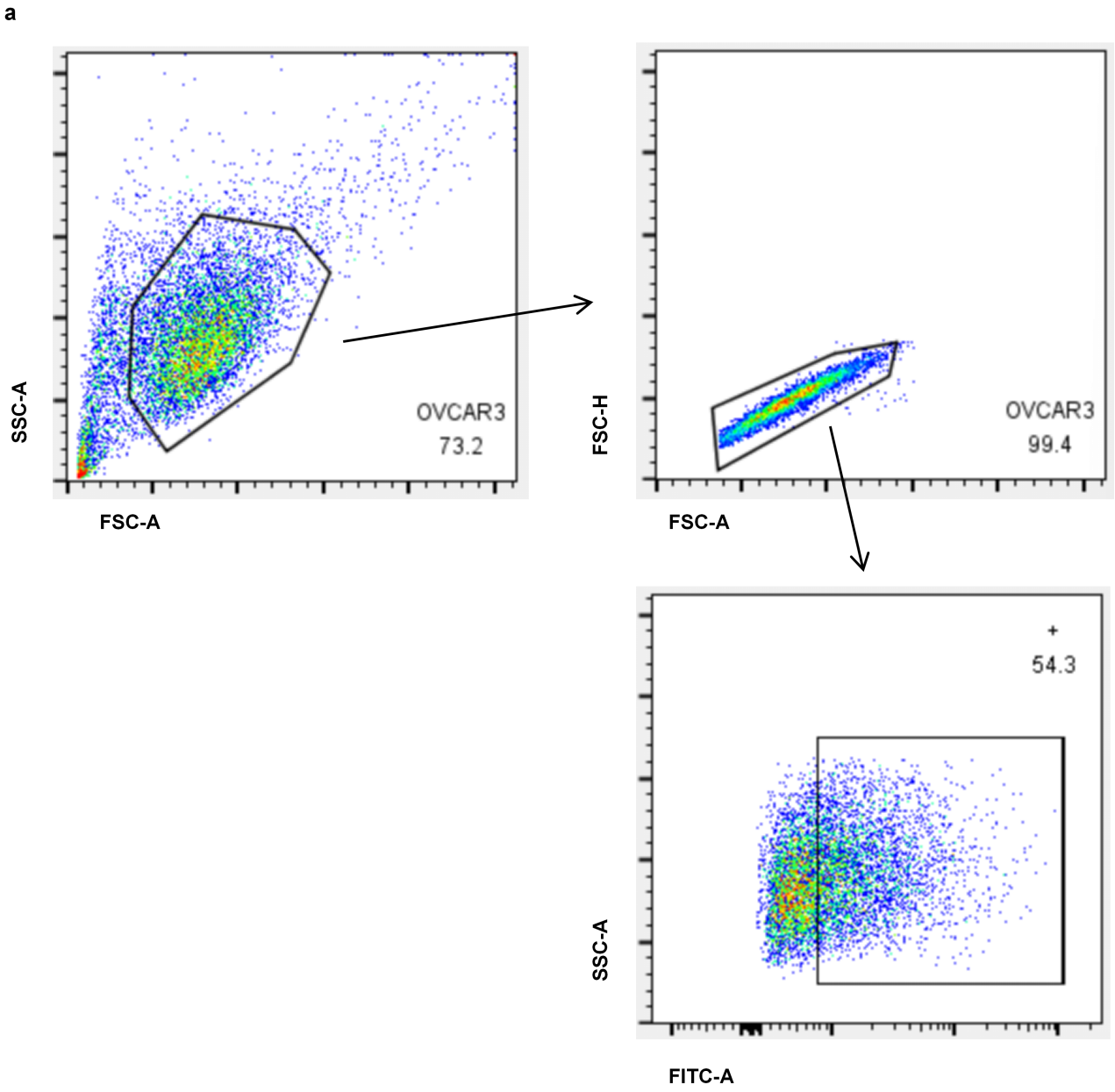
Supplementary Figure 11. Full-size blots of Figure 5b.

Supplementary Figure 12



Supplementary Figure 12. Full-size blots of Figure 5b.

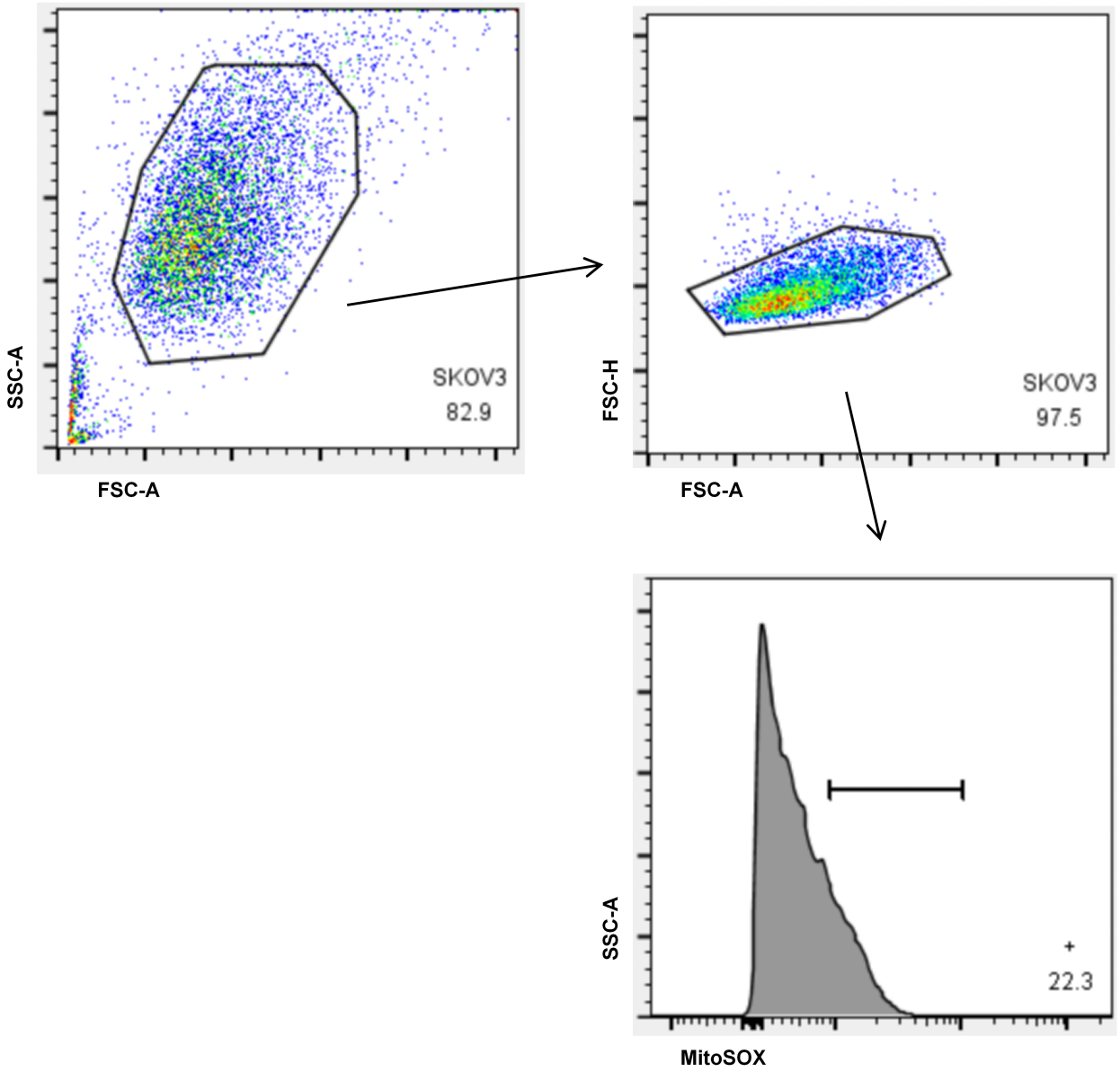
Supplementary Figure 13



Supplementary Figure 13. Gating strategy to determine the percentage of OVCAR3 cells.

Supplementary Figure 14

a



Supplementary Figure 14. Gating strategy to determine the percentage of SKOV3 cells.