SUPPLEMENTARY INFORMATION

Figure S1. Efficient incorporation of PUFA. PC3 cells (2 x10^6) were incubated with 60 µM LA (18:2n-6), AA (20:4n-6), EPA (20:5n-3) or DHA (22:6n-3) for 48 h and processed for fatty acid methyl ester analysis. Three independent experiments were performed. Averages and standard deviations are shown. Bars labeled with different letters are significantly different from each other (ANOVA, $p<0.05$).

Figure S2. Structural modification of PC by PUFA. PC3 cells were treated with 60 µM LA (18:2n-6), AA (20:4n-6), EPA (20:5n-3) or DHA (22:6n-3) for 48 h and processed for phosphatidylcholine (PC) analysis. Three independent experiments were performed. Averages and standard deviations are shown. Bars labeled with different letters are significantly different from each other (ANOVA, $p<0.05$).

Figure S3. Structural modification of PE by PUFA. PC3 cells were treated with 60 µM LA (18:2n-6), AA (20:4n-6), EPA (20:5n-3) or DHA (22:6n-3) as indicated for 48 h and processed for phosphatidylethanolamine (PE) analysis. Three independent experiments were performed. Averages and standard deviations are shown. Bars labeled with different letters are significantly different from each other (ANOVA, $p<0.05$).

Figure S4. Structural modification of PS by PUFA. PC3 cells were treated with 60 µM LA (18:2n-6), AA (20:4n-6), EPA (20:5n-3) or DHA (22:6n-3) as indicated for 48 h and processed for phosphatidylserine (PS) analysis. Three independent experiments were performed. Averages and standard deviations are shown. Bars labeled with different letters are significantly different from each other (ANOVA, $p<0.05$).

Figure S5. Structural modification of PI by PUFA. PC3 cells were treated with 60 µM LA (18:2n-6), AA (20:4n-6), EPA (20:5n-3) or DHA (22:6n-3) as indicated for 48 h and processed for phosphatidylinositol (PI) analysis. Three

independent experiments were performed. Averages and standard deviations are shown. Bars labeled with different letters are significantly different from each other (ANOVA, $p<0.05$).

Figure S6. (**A**) Effect of PIPs on AKT phosphorylation. *Pten* wild-type mouse prostate cells were starved for 12 h, and then incubated with 5 µM 16:0,16:0PI(3,4)P_2 and 16:0,16:0PI(3,4,5)P_3 for 20 min. Phospho-AKT (pAKT) was detected by Western blot. Levels of pAKT were normalized to the total AKT. Arbitrary units of $pAKT^{T308}$ and $pAKT^{S473}$ were calculated after setting the normalized values in the controls as one. Bars labeled with different letters are significantly different from each other (ANOVA, $p<0.05$). (**B**) Antibody-antigen competition immunofluorescent microscopy. LNCaP cells were starved for 24 h and stimulated with media plus 1% FBS for 20 min and then stained with anti-PI(3,4,5)P_3 antibody alone or with the antibody plus 5 µM of PIP_3. Green color indicates the staining of PIP_3.

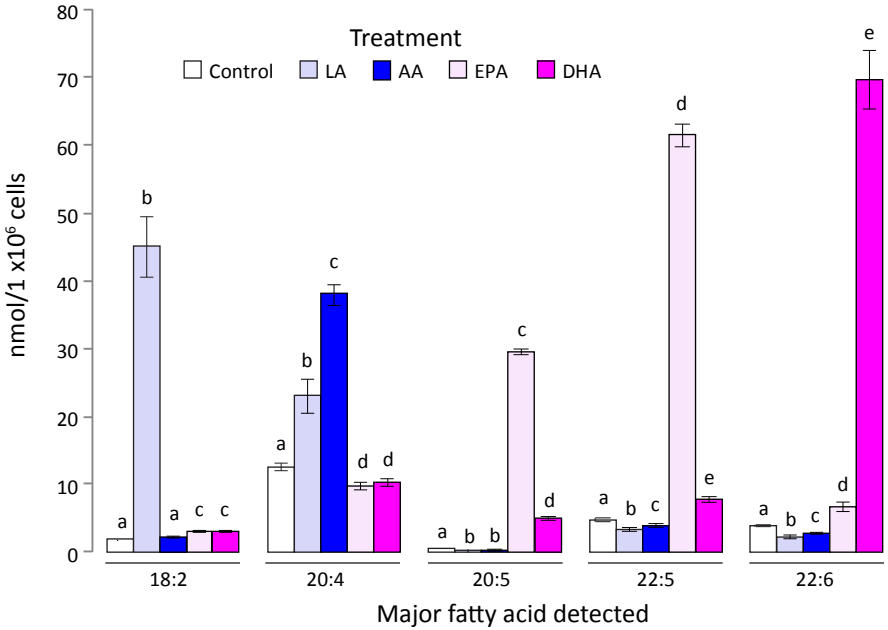
Treatment
Control
LA
AA
EPA
DHA
nmol/1 x10^6 cells
0
10
20
30
40
50
60
70
80
18:2
20:4
20:5
22:5
22:6
Major fatty acid detected

Figure S1

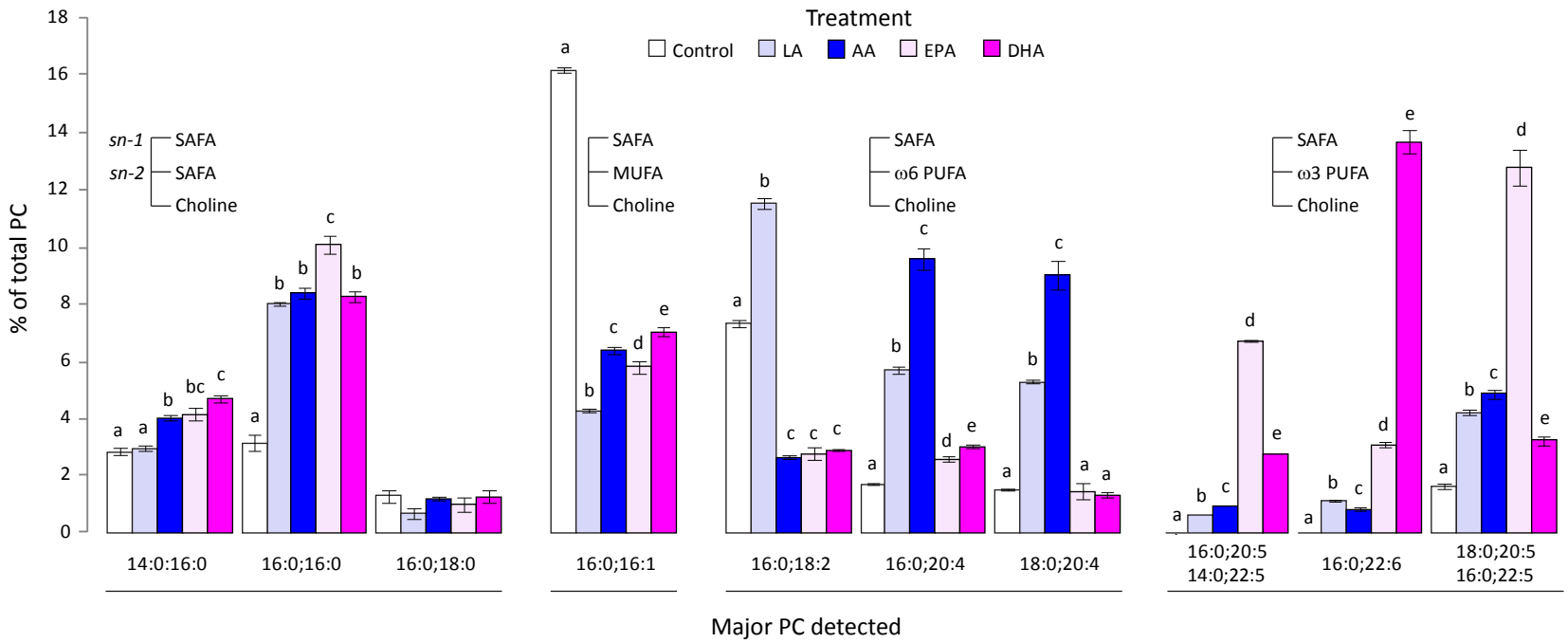
Treatment
Control
LA
AA
EPA
DHA
% of total PC
0
2
4
6
8
10
12
14
16
18
sn-1 SAFA
sn-2 SAFA
Choline
SAFA
MUFA
Choline
SAFA
ω6 PUFA
Choline
SAFA
ω3 PUFA
Choline
14:0:16:0
16:0;16:0
16:0;18:0
16:0;16:1
16:0;18:2
16:0;20:4
18:0;20:4
16:0;20:5
14:0;22:5
16:0;22:6
18:0;20:5
16:0;22:5
Major PC detected

Figure S2

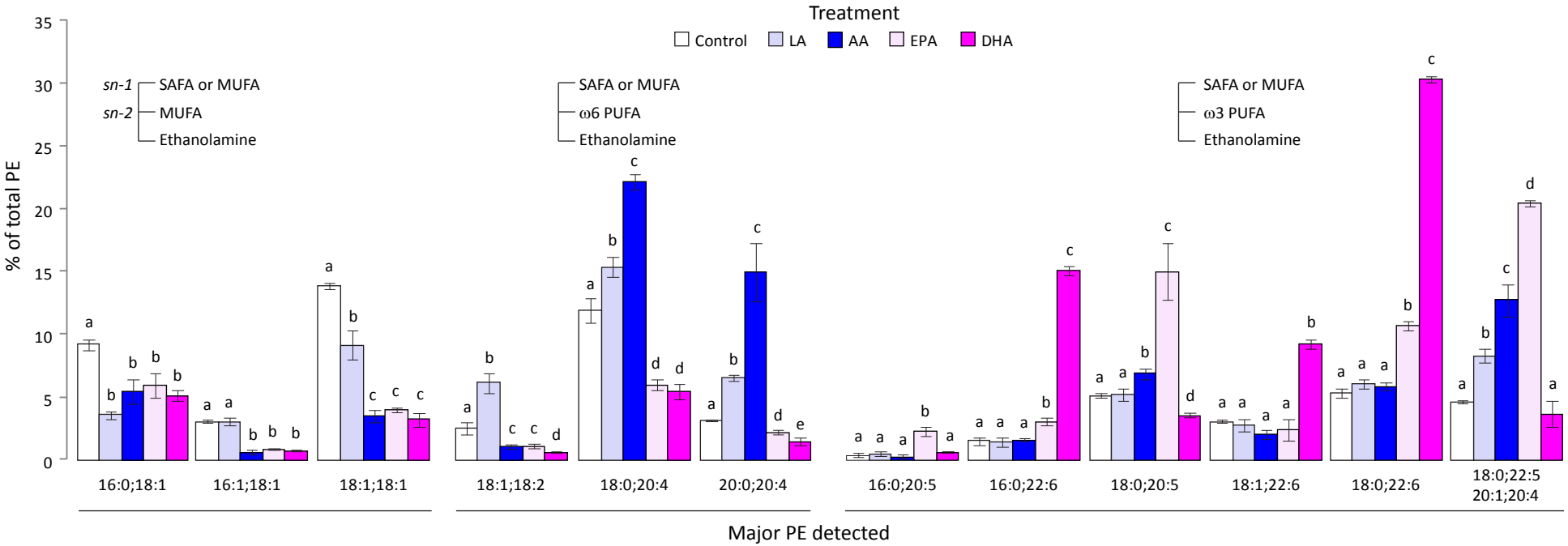
Treatment
Control
LA
AA
EPA
DHA
% of total PE
35
30
25
20
15
10
5
0
sn-1
sn-2
SAFA or MUFA
MUFA
Ethanolamine
SAFA or MUFA
ω6 PUFA
Ethanolamine
SAFA or MUFA
ω3 PUFA
Ethanolamine
16:0;18:1
16:1;18:1
18:1;18:1
18:1;18:2
18:0;20:4
20:0;20:4
16:0;20:5
16:0;22:6
18:0;20:5
18:1;22:6
18:0;22:6
18:0;22:5
20:1;20:4
Major PE detected

Figure S3

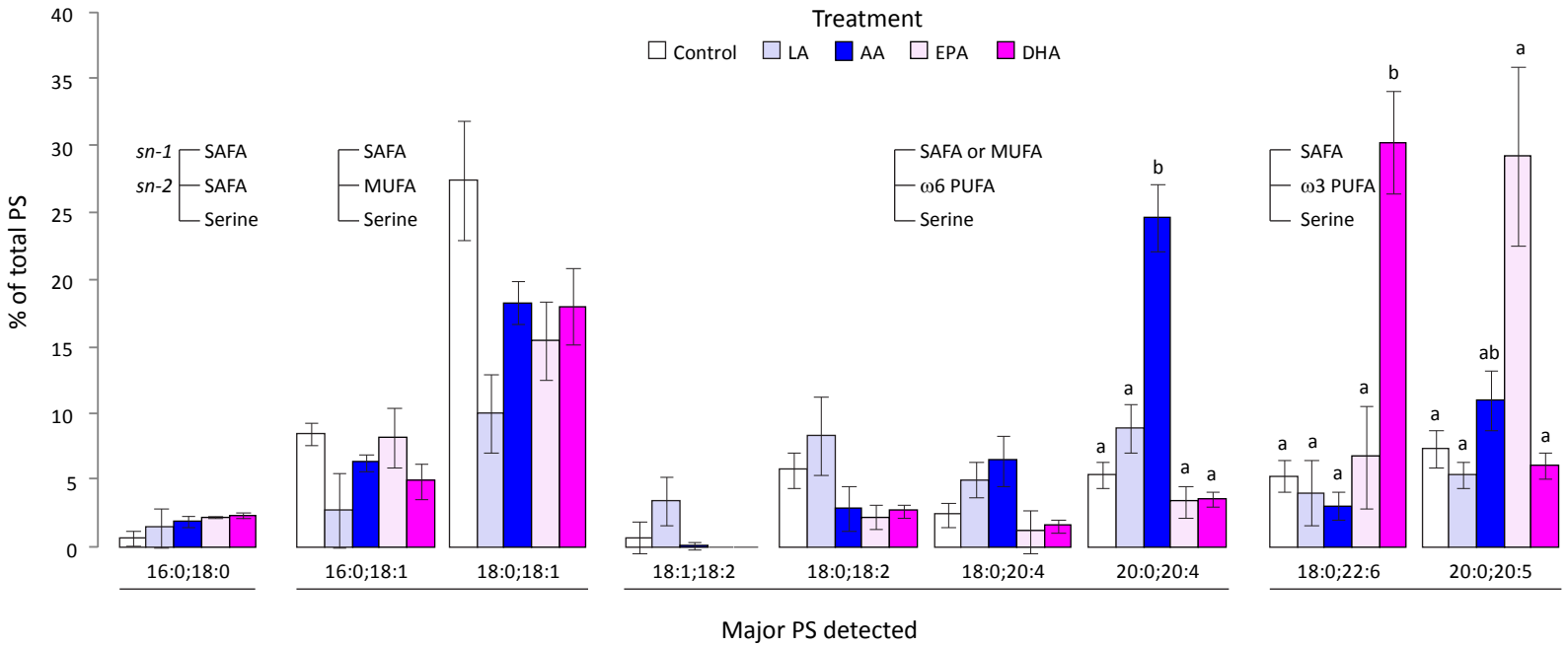
Treatment
Control
LA
AA
EPA
DHA
% of total PS
40
35
30
25
20
15
10
5
0
sn-1
sn-2
SAFA
SAFA
Serine
SAFA
MUFA
Serine
SAFA or MUFA
ω6 PUFA
Serine
SAFA
ω3 PUFA
Serine
a
a
a
a
b
a
a
a
a
b
a
ab
a
16:0;18:0
16:0;18:1
18:0;18:1
18:1;18:2
18:0;18:2
18:0;20:4
20:0;20:4
18:0;22:6
20:0;20:5
Major PS detected

Figure S4

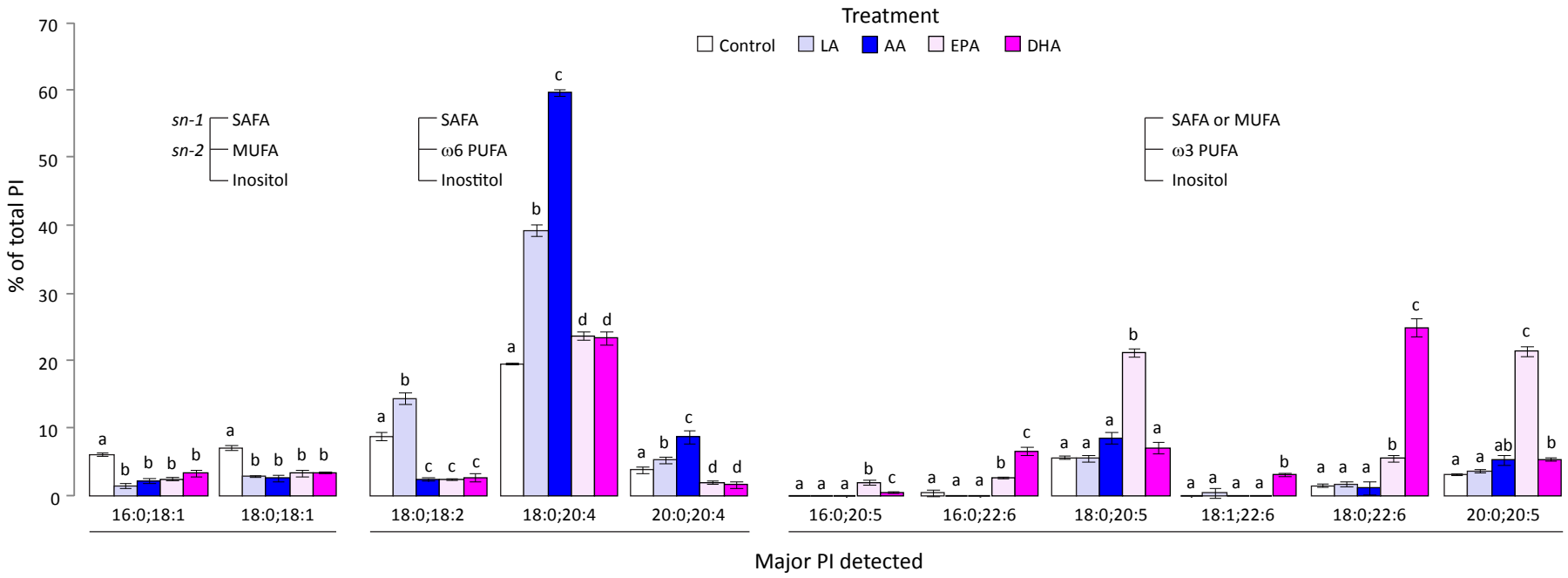
Treatment
Control
LA
AA
EPA
DHA
% of total PI
70
60
50
40
30
20
10
0
sn-1
sn-2
SAFA
MUFA
Inositol
SAFA
ω6 PUFA
Inostitol
SAFA or MUFA
ω3 PUFA
Inositol
16:0;18:1
18:0;18:1
18:0;18:2
18:0;20:4
20:0;20:4
16:0;20:5
16:0;22:6
18:0;20:5
18:1;22:6
18:0;22:6
20:0;20:5
Major PI detected

Figure S5

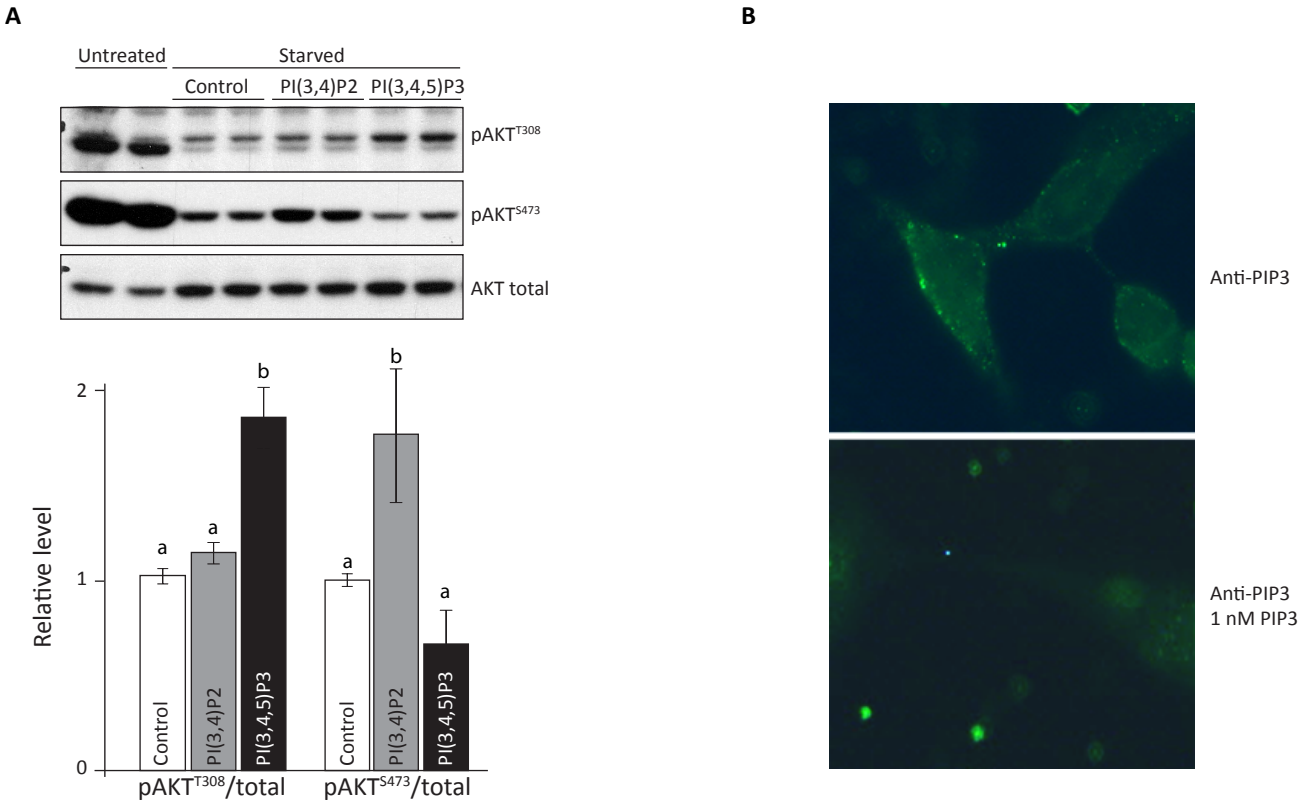
A
Untreated
Starved
Control
PI(3,4)P2
PI(3,4,5)P3
pAKT^T308
pAKT^S473
AKT total
Relative level
2
1
0
a
a
b
a
b
a
Control
PI(3,4)P2
PI(3,4,5)P3
Control
PI(3,4)P2
PI(3,4,5)P3
pAKT^T308/total
pAKT^S473/total
B
Anti-PIP3
Anti-PIP3
1 nM PIP3

Figure S6