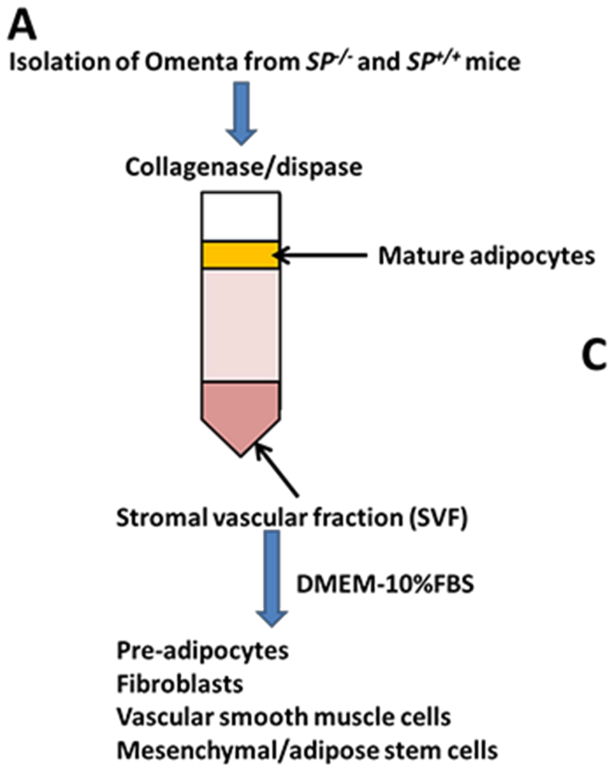
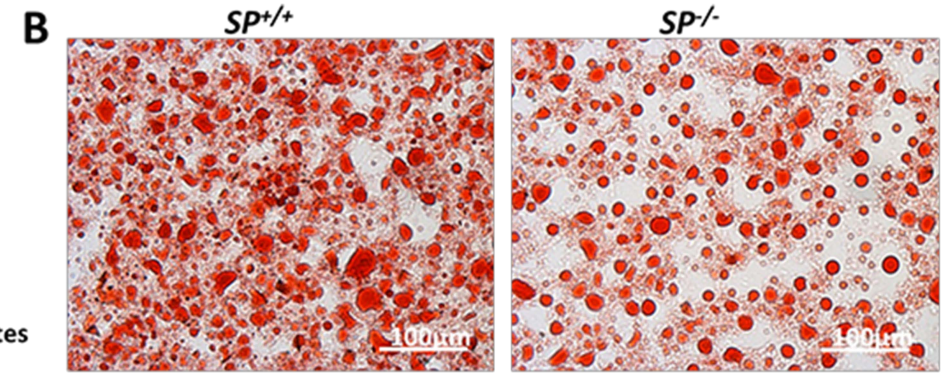
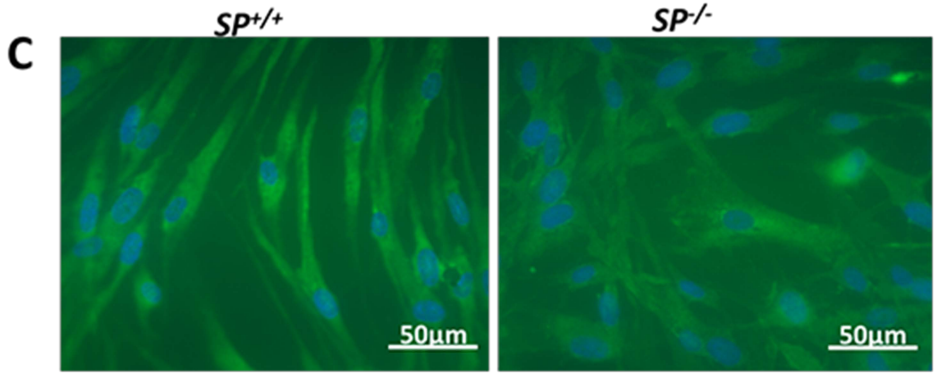
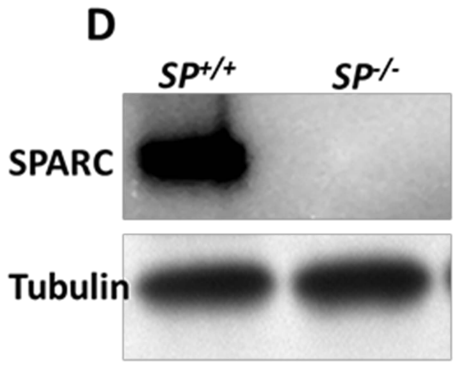
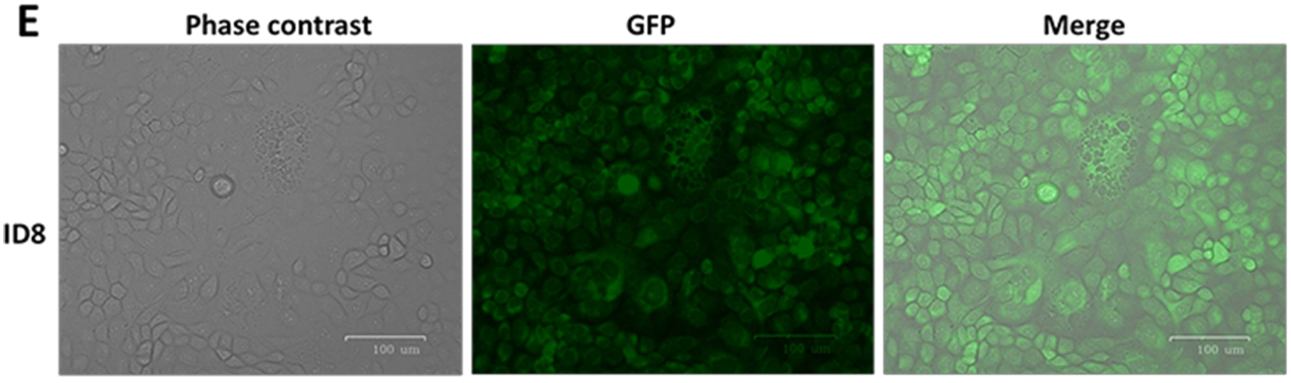
Supplement Figure 1

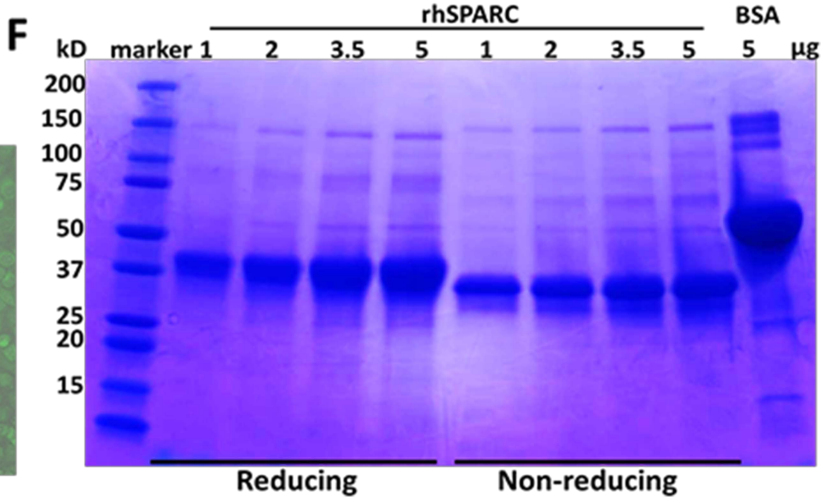












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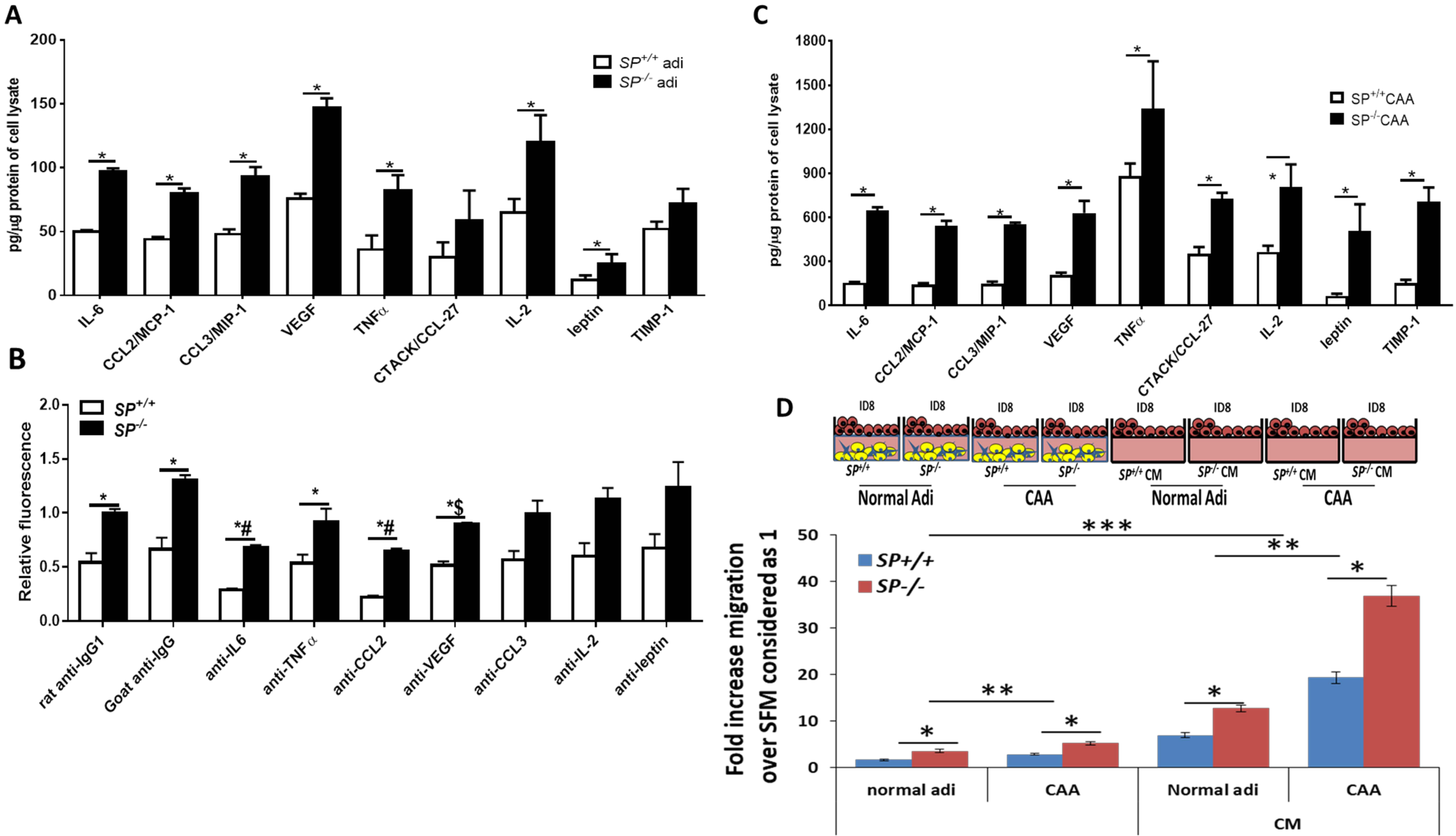

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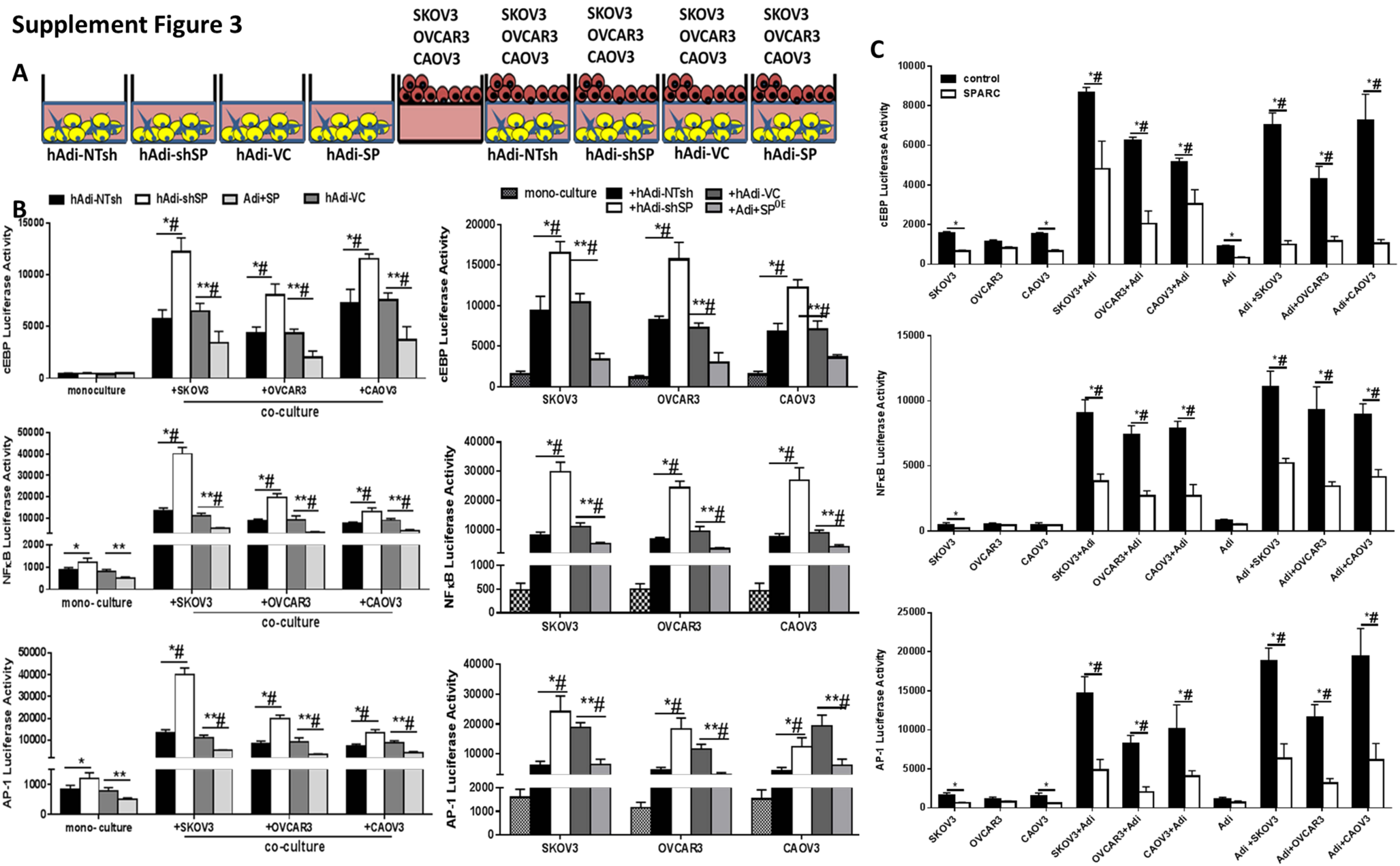

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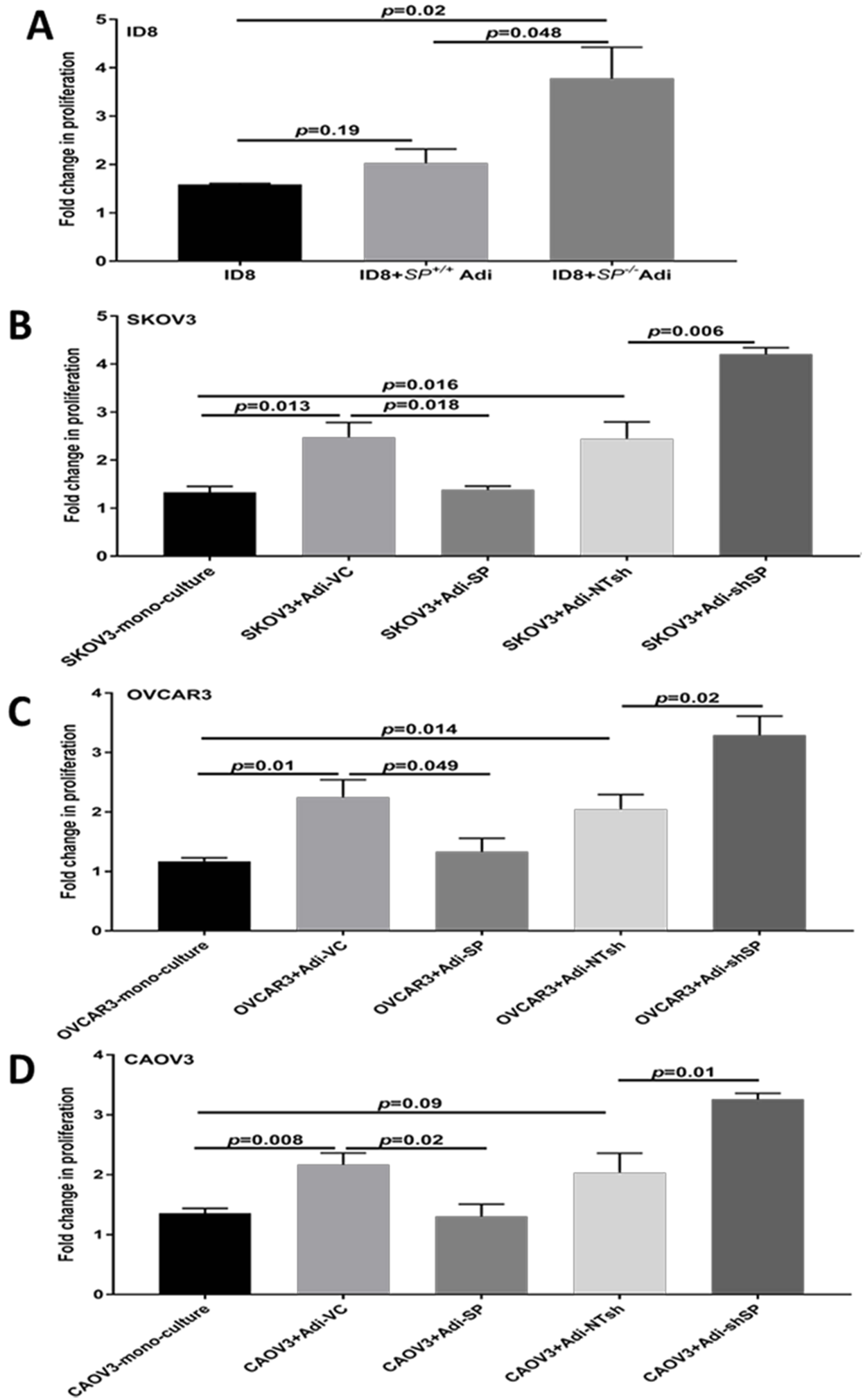

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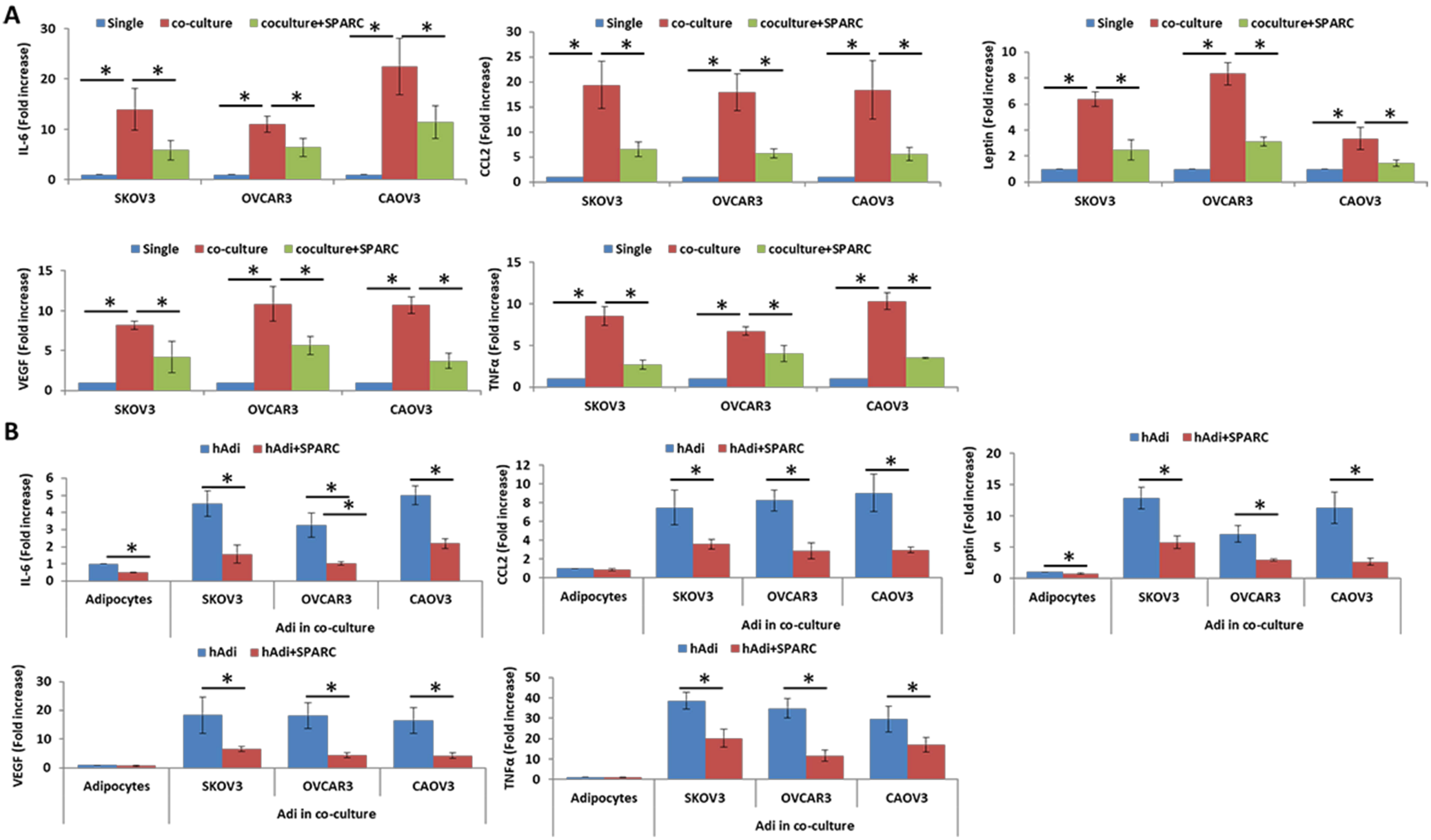

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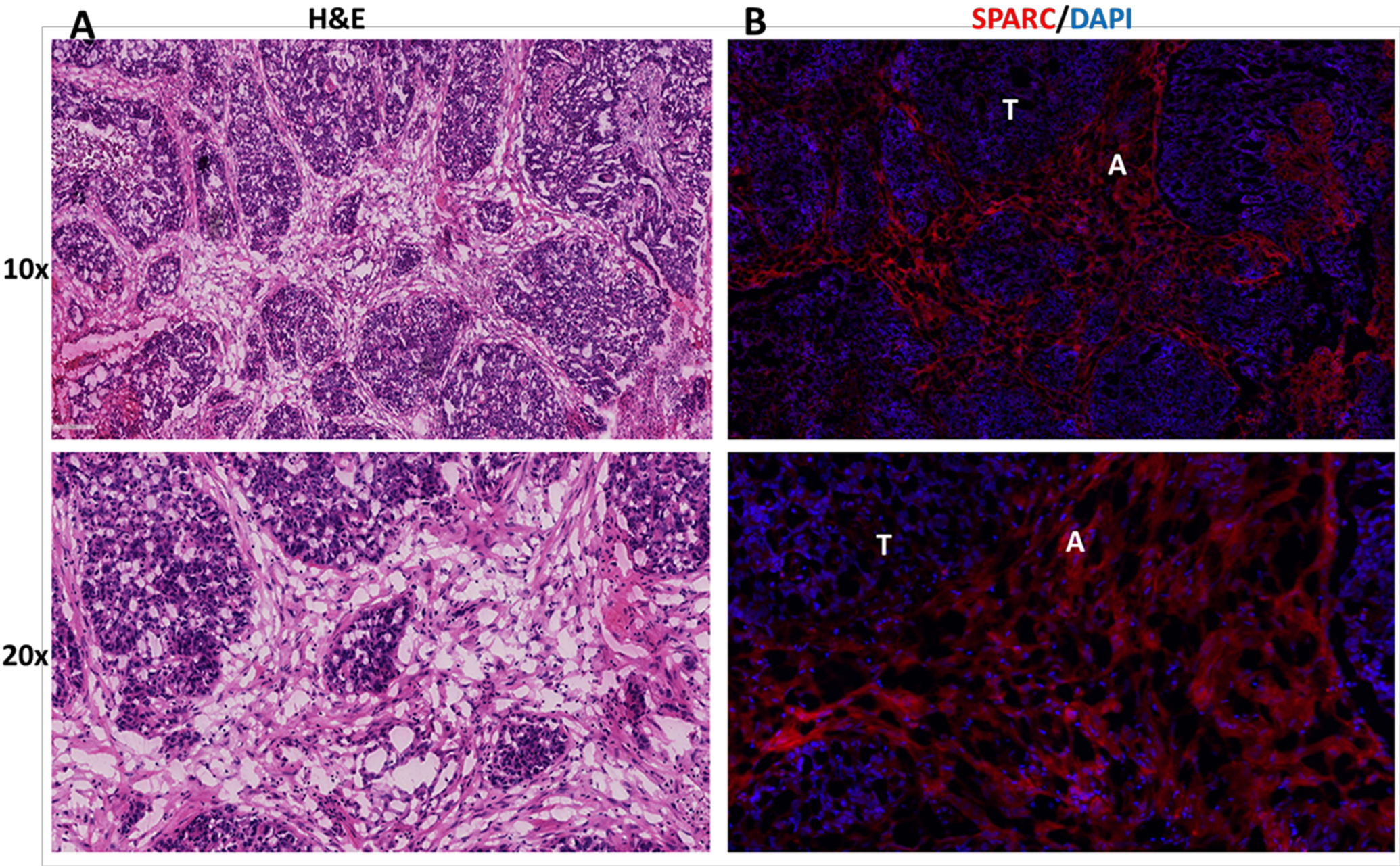

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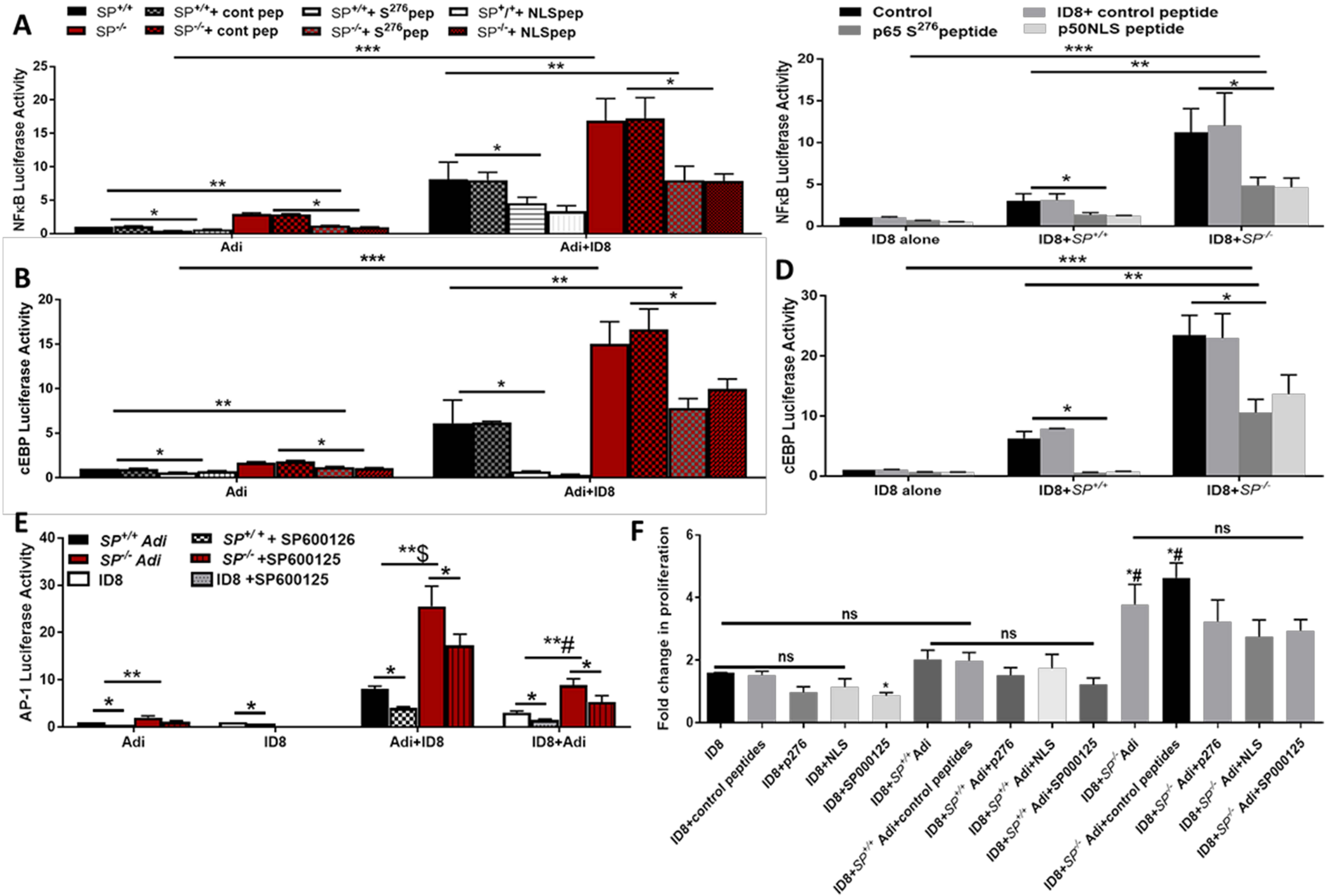

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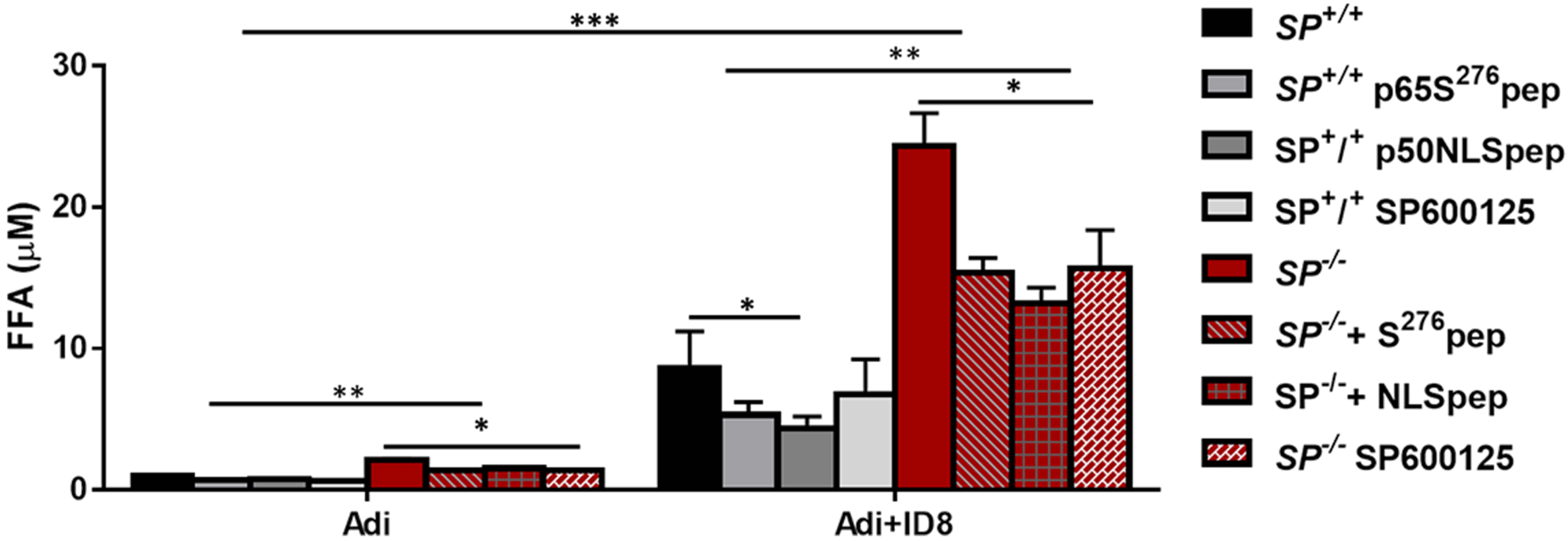

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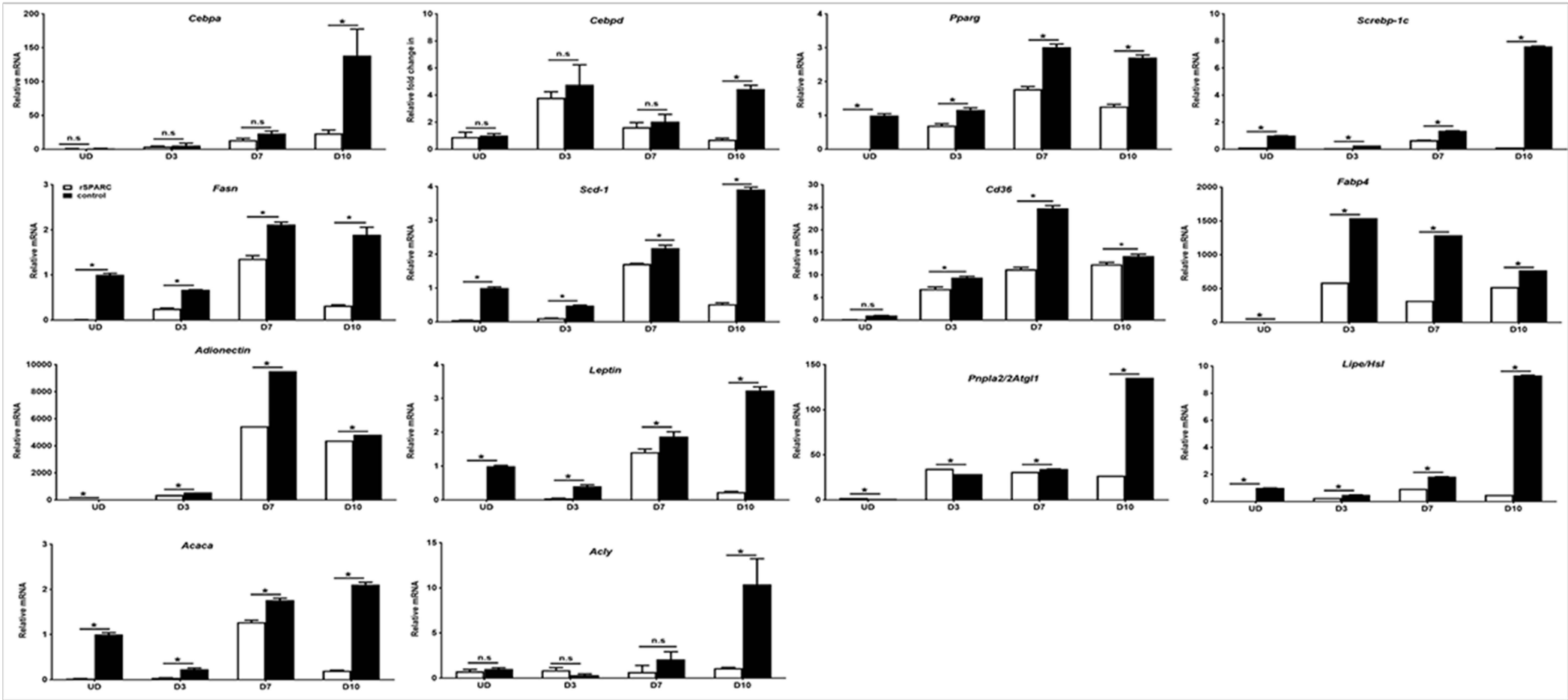

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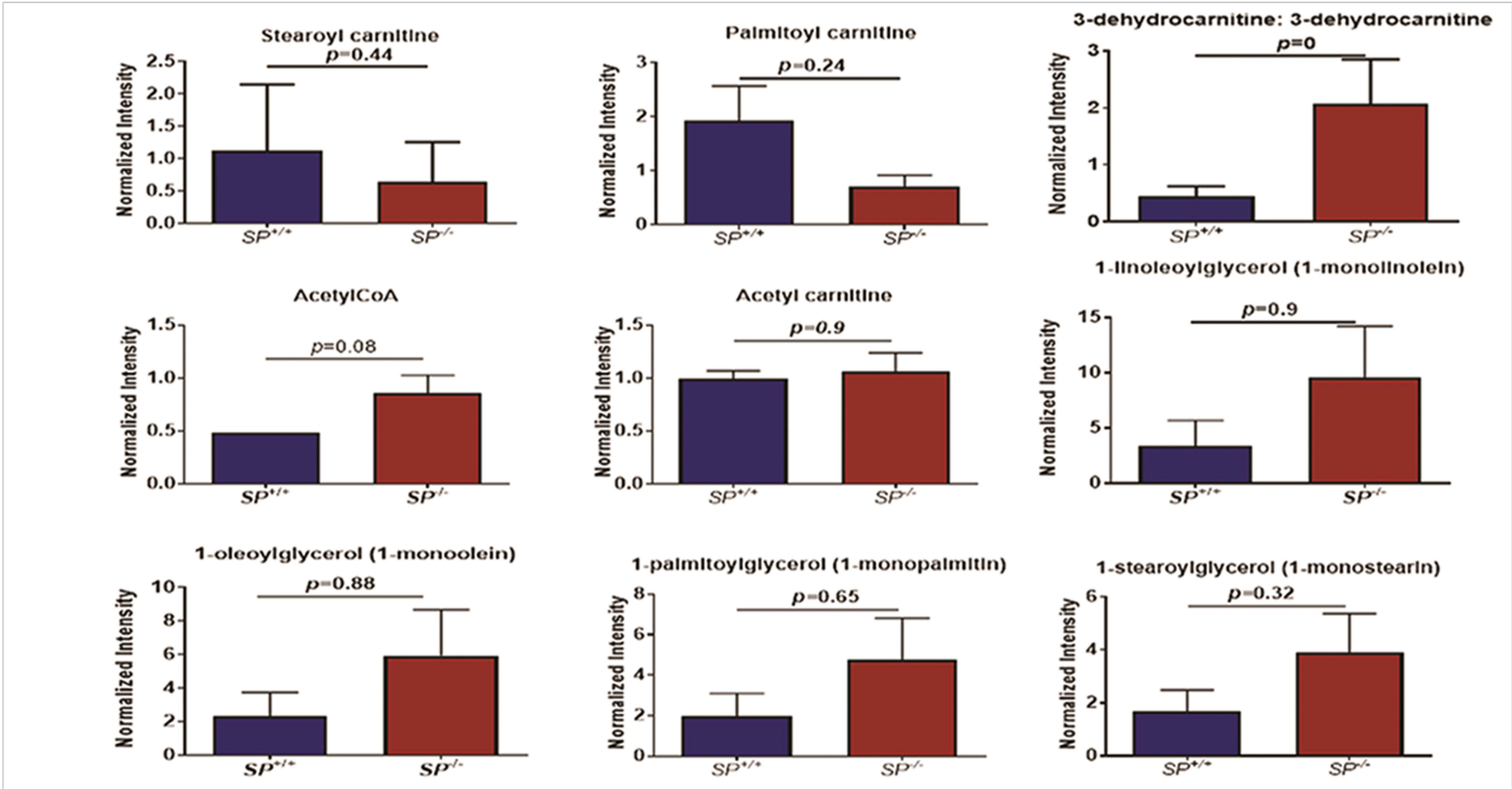

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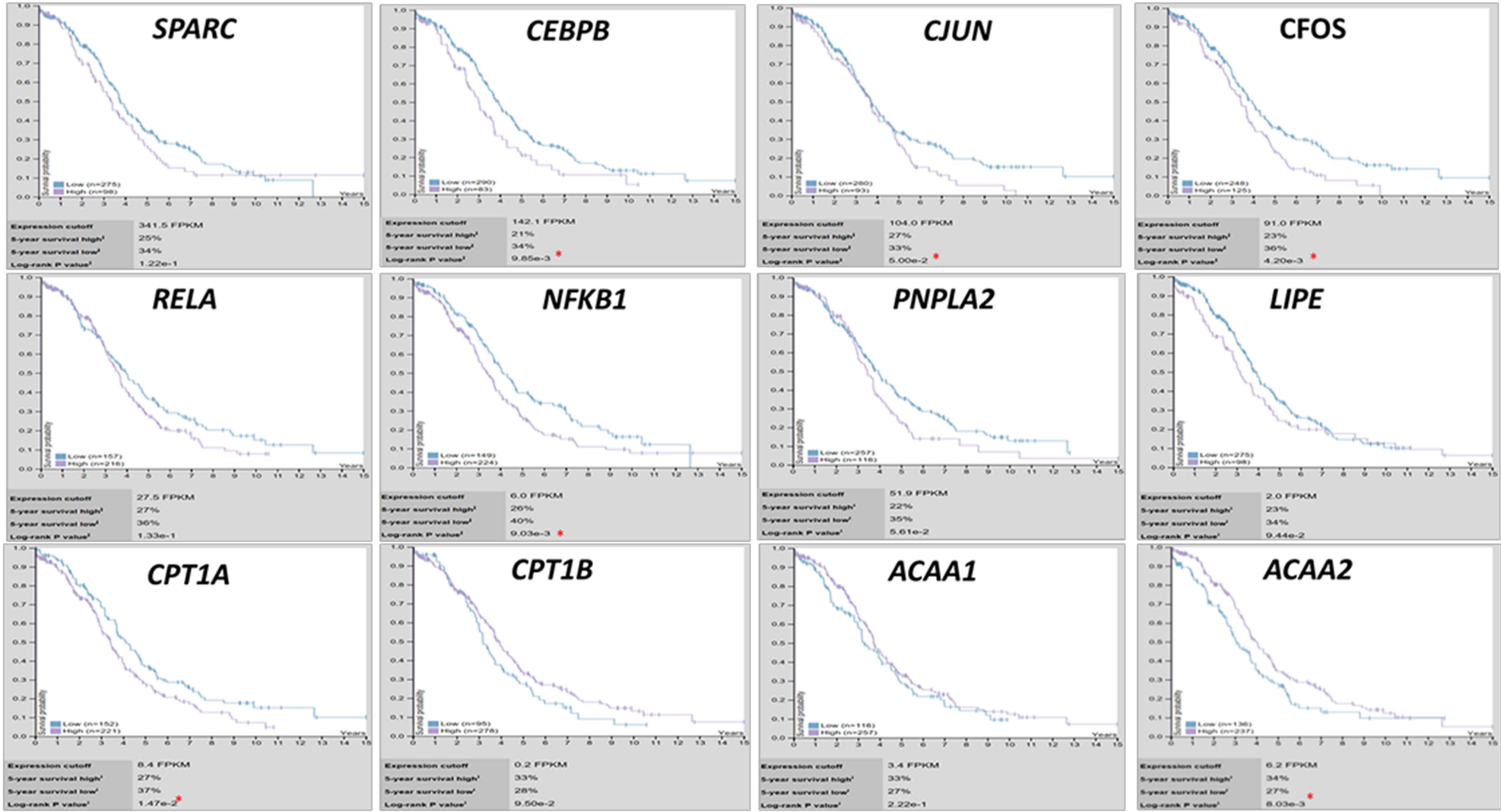

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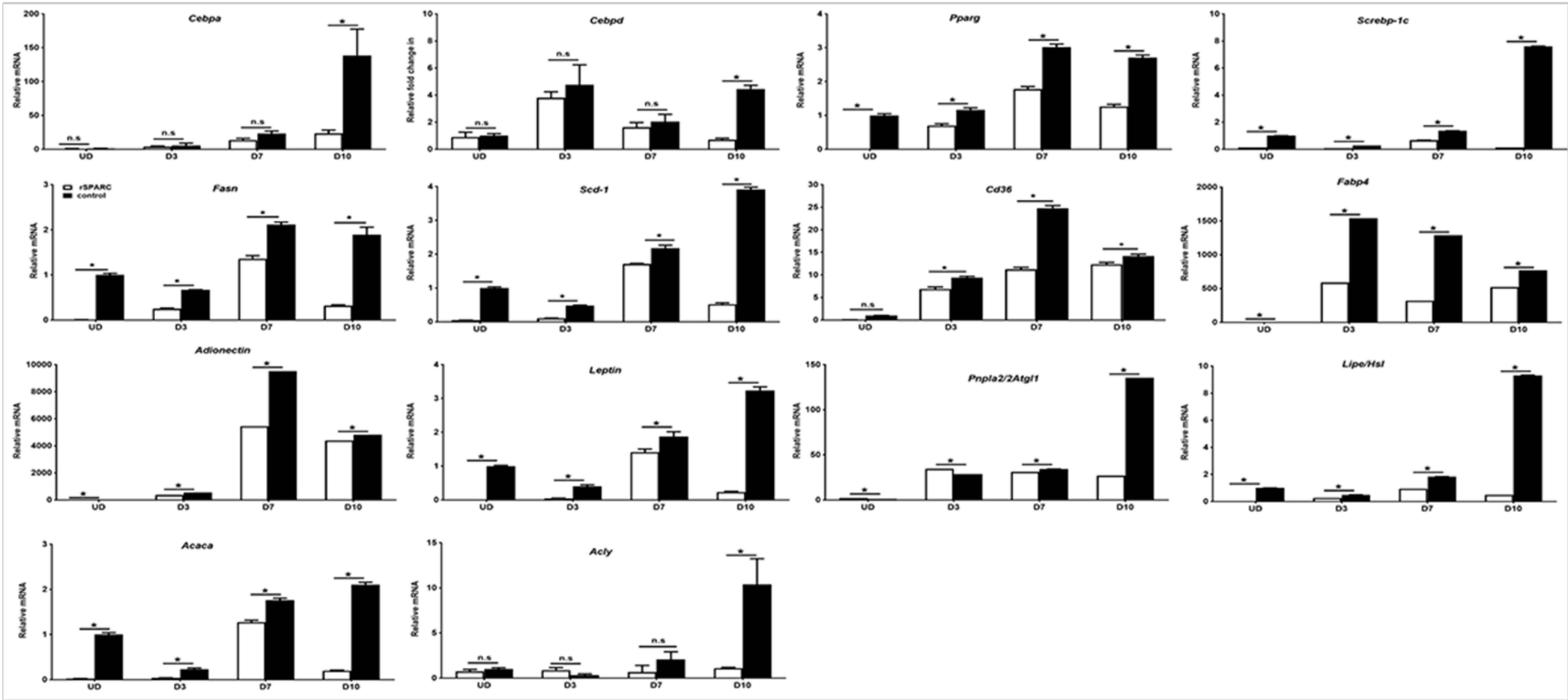

Supplement Figure Legends:

Supplement Figure 1: Isolation of primary mouse preritoneal stromal cells. A. Schema of the isolation of omental adipocytes from *$SP^{-/-}$ and $SP^{+/+}$.* **B.** Oil O red staining of freshly isolated primary adipocytes. **C.** α-smooth muscle actin (α-sma) staining showing fibroblastoid phenotype of omental stromal cells. **D.** Western blot showing the expression of SPARC protein in *$SP^{-/-}$ and $SP^{+/+}$* adipocytes. **E.** Phase contrast (left), fluorescence (middle) and merged phase/fluorescent images of ID8-GFP cells showing the GFP expression levels. Scale bars, 100µm. **F.** Coomassie blue stained SDS-PAGE (4-20%) gel showing rhSPARC molecular weights at the indicated concentrations reconstituted in DPBS containing 0.1% BSA under reducing and non-reducing conditions. Five microliters of 0.1% BSA alongside the samples in lane 10.

Supplement Figure 2: Homing of Ovarian Cancer cells towards normal adipocytes is mediated through secreted factors. A. Bar graphs of the means ± SEM of the levels of cytokines and chemokines secreted in CM of normal $SP^{+/+}$ and $SP^{-/-}$ adipocytes, *p<0.05 comparing $SP^{+/+}$ and $SP^{-/-}$ adipocytes, Student's *t*-test. **B.** Bar graphs of the means ± SEM of the relative fluorescence intensity of ID8-GFP that homed to $SP^{+/+}$ and $SP^{-/-}$ *in vivo* in the presence of functional blocking antibodies to the indicated chemokines and their isotype controls. **p<0.05 comparing $SP^{+/+}$ and $SP^{-/-}$ within each condition; $^{\#}p$<0.05 compared to isotype control. $^{\$}p$<0.05 comparing the $SP^{-/-}$ to the corresponding isotype control. **C.** Bar graphs of the means ± SEM of the levels of cytokines and chemokines secreted in CM of normal $SP^{+/+}$ and $SP^{-/-}$ CAA. *p<0.05 comparing $SP^{+/+}$ and $SP^{-/-}$ adipocytes, Student's *t*-test. **D.** Schema of the homing/migration of ID8 cells towards normal Adi and CAA and their CM. Bars report mean ± SEM of the fold increase in migration compared to control medium considered as 1. *p<0.05 comparing $SP^{+/+}$ and $SP^{-/-}$. ***p<0.05* comparing normal Adi to CAA. ****p<0.05* comparing migration towards adipocytes to 72h CM.

Supplement Figure 3: Adipcyte-SPARC inhibits co-culture-induced activation of cEBPβ, NFkB and AP-1 in primary human omental adipocytes and human OvCa cells A. Schematic illustration of the experimental design of the co-cultures of OvCa cells and omental adipocytes. **B.** Primary human omental adipocytes overexpressing (hAdi-VC and hAdi-SPARC) or depleted of SPARC (hAdi-NTsh and hAdi-shSPARC) and their vector controls were transfected with luciferase reporter plasmids of cEBPβ, NFκB and AP-1 and were co-cultured with human OvCa cells for further 24h. The activation of each transcription factor was determined by measuring the luciferase reporter activity in each cell type. Bars represent mean

± SEM of one of three experiments performed in triplicates. *p<0.05 comparing hADi-NTsh and hAdi-shSPARC **p<0.05 comparing hAdi-VC and hAdi-SPARC; and $^{\#}p$<0.05 student's *t*-test comparing cells in single to co-cultures; comparing OvCa cells in single to co-culture with hAdi-VC and hAdi-SPARC; Student's *t*-test **C.** Treatment of mon-and co-cultures of OvCa cells and adipocytes with rSPARC (5µg/ml). The activation of each transcription factor was determined by measuring the luciferase reporter activity in each cell type. Bars represent mean ± SEM of one of three experiments performed in triplicates. *p<0.05 comparing cells with/without rSPARC; $^{\#}p$<0.05 student's *t*-test comparing cells in single to co-cultures.

Supplement Figure 4: The proliferation of the OvCa cell lines in mono and co-cultures with adipocytes (under same experimental conditions of luciferase reporter assays **Figure 3C** and **Supplement Figure 3B-C**) was determined by CyQuant assay at the start of the experiments with mono- and co-cultures (0h) and at the end of the experiment (24h). Fold changes of the DNA content (proliferation) was determined for each cell type at 0 and 24h. Bars represent mean ± SEM of fold change in proliferation measured at 24h over 0h at the start of co-culture. *p* values were determined by unpaired Student's *t*-test. These fold changes were used to correct for the luciferase activity levels presented in **Figure 3C** and **Supplement Figure 3B-C.**

Supplement Figure 5: Exogenous rSPARC suppresses co-culture-induced activation of cEBPβ, NFkB and AP-1 in primary human omental adipocytes and human OvCa cells. A. the expression of the transcripts of IL-6, CCL2, Leptin, VEGF, and TNFα was determined in human OvCa cells in single and co-cultures with primary human adipocytes (hAdi) as described in **Supplement Figure 3**. Bars represent mean ± SEM of the fold changes in the transcript in ID8 cells in co-cultures compared to single cultures considered as 1 in one of three experiments performed in triplicates. **B.** Bars represent the mean ± SEM of the fold changes in the transcript levels in adipocytes in co-cultures compared to single cultures considered as 1. *p<0.05, unpaired Student's *t*-test.

Supplement Figure 6: A. H&E sections of omental metastasis of HGSC specimens at indicated magnifications. **B.** Immunofluorescence showing the expression of SPARC in tumor cells (T) and adipocytes (A).

Supplement Figure 7: Effect of blockade of NFkB, AP-1 and cEBPβ on their activity in OvCa cells and adipocyte: Treatment of ID8 and adipocytes in single and co-cultures with NFkB cell permeable peptides S276 pep and NLS pep inhibited NFkB and cEBP luciferase

reporters in adipocytes **A-B,** and ID8 cells**, C-D.** *p<0.05 between controls and inhibitor treatments, **p<0.05 comparing $SP^{+/+}$ and $SP^{-/-}$ adipocytes. ***p<0.05 comparing cells in mono- and co-cultures**. E.** Treatment of ID8 and adipocytes in single and co-cultures with JNK inhibitor SP600125 inhibited co-culture induced AP-1 luciferase reporter in both cell types. *p<0.05 comparing controls with inhibitor treatments. Bars represent mean s± SEM of one of 2 experiments each performed in quadruplicates. **p<0.05 comparing $SP^{+/+}$ and $SP^{-/-}$ adipocytes. $^{\$}p$<0.05 comparing adipocytes in mono- and co-cultures with ID8 cells, $^{\#}p$<0.05 comparing ID8 in mono can co-cultures with adipocytes; unpaired Student's *t*-test. **F.** The proliferation of the ID8 cells in mono and co-cultures with $SP^{+/+}$ and $SP^{-/-}$ adipocytes (under same experimental conditions of luciferase reporter assays **in A-E** was determined by CyQuant assay at the start of the experiments with mono- and co-cultures (0h) and at the end of the experiment (24h). Fold changes of the DNA content (proliferation) was determined for each cell type at 0 and 24h. Bars represent mean ± SEM of fold change in proliferation measured at 24h over 0h at the start of co-culture. *$p<0.05$ compared to control ID8 cells in mono-cultures. #p<0.05, comparing ID8 cells in coculture with $SP^{+/+}$ and $SP^{-/-}$ adipocytes, unpaired Student's *t*-test. These fold changes were used to correct for the luciferase activity levels presented in **A-E.**

Supplement Figure 8: Inhibition of NFkB (S276 and NLS peptides) and AP-1 (JNK inhibitor, SP6000125) inhibited co-culture-induced FFA release from adipocytes in mono and co-cultures with ID8 cells. Bars represent means ± SEM fluorescent intensity of the released of FFA from a representative of 3 independent experiments each preformed in quadruplicates. *p<0.05 comparing controls with inhibitor treatments, **p<0.05 comparing $SP^{+/+}$ and $SP^{-/-}$ adipocytes, ***p<0.05 comparing mono- and co-cultures; Student's *t*-test.

Supplement Figure 9: Effect of SPARC on adipogenic differentiation factors in 3T3L1 adipocytes. 3T3L pre-adipocytes were stimulated to differentiate into adipocytes the presence with the appropriate media as described in "Material and Methods" in the presence or absence of 5µg/ml recombinant murine SPARC. mRNA was isolated at the indicated time points. Bars report means ± SEM of the expression levels of the indicated genes of a representative of 2 experiments each performed in triplicates. *p<0.05, Student's *t*-test.

Supplement Figure 10: Bars depict means ± SEM of lipid metabolites measured in ID8 omental tumor nodules isolated 6 weeks after ip injection of ID8 in $SP^{+/+}$ and $SP^{-/-}$ mice (n=6/genotype). p<0.05, Student's *t*-test.

Supplement Figure 11: Kaplan Meier curves curated from TCGA and Protein Atlas (https://www.proteinatlas.org/) showing the correlation of the expression of cEBPβ, AP-1 (cJun and cFos) and NFκB (RelA, and NFκB1) and downstream target inflammatory and metabolic genes with patients' survival. *p<0.05.

Supplement Figure 1: Patients' data of tumor tissue specimens.

A. WF-TTPSR (High Grade Serous):

	pT1+pT2	**pT3+**
Number	6	29
Age	61.5 ± 4.66	65.17 ± 2.113
Grade **G1+G2** **HG (G3+G4)**	 1 5	 1 28

B. CHTN (serous papillary and poorly differentiated):

	pT1+pT2	**pT3+**
Number	10	30
Age	65.7 ± 5.916	63.2 ± 2.288
Grade: G1+G2 HG (G3+G4)	 5 5	 15 15

Supplement Table 2: Antibodies

Primary and secondary Antibodies	Catalog #	Dilution	Molecular weight
Rabbit Anti- SPARC (CST)	8725	1:250 (40 ug) WB 1:100 IHC (Paraffin and IF)	43 kDa
Mouse Anti-SPARC (Abnova) MAB0278	MAB0278	1:500 WB 1:100 IHC (Paraffin and IF)	43 kDa
Rabbit Anti- FABP4 (CST) Fatty acid binding protein	3544	1:1500 (25 ug) WB 1:200 IF	15 kDa
Rabbit Anti-CD36 (CST)	14347	1:200 IF	
Rabbit Anti- CEBP Alpha (CST) CCAAT/enhancer-binding proteins	8178	1: 1500 (25 ug) WB	42 kDa
Rabbit Anti- CEBP Beta (CST) CCAAT/enhancer-binding proteins	3084	1: 500 (25 ug) 1:200 IHC (Paraffin and IF)	38, 41 kDa
Rabbit Anti- PPAR Gamma (CST) Peroxisome proliferator-activated receptor	2435	1: 250 (25 ug)	53, 57 kDa
Rabbit Anti- HSL (Hormone Sensitive Lipase) (CST)	4139	1:3000 (25 ug)	81, 83 kDa
Rabbit- Anti- Phospho CEBP Thr 235 (CST)	3084	1:500	19 k Da LIP; 36-38 kDa LAP
Rabbit Anti- ATGL (CST)	2439	1:500	54 kDa
Mouse Anti- tubulin (Sigma)	T5168	1:5000	55 kDa
Anti-rabbit and anti-mouse HRP-conjugated antibodies (ThermoFisher)	Cat # 31460 Cat # 31430	1:2000 (WB) 1:400 (IHC-P)	
NIR680 and 800 anti-mouse and anti-rabbit secondary antibodies (Licor)	[P/N 925-32210] [P/N 925-32211] [P/N 925-68020] [P/N 925-68021]	1:10000 (WB)	
Alexa-fluor 488 anti-rabbit antibodies. (Invitrogen)	Cat # A-11034	1:400 (IF)	
Alexa-fluor 594 anti-rabbit antibodies. (Invitrogen)	Cat # A-11032	1:400 (IF)	

Supplementary Table 3: List of human primers used for real-time PCR

Gene	Forward Primer sequence [5'-3'] Oligo	Reverse Primer sequence [5'-3'] Oligo
GAPDH	AGGGCTGCTTTTAACTCTGGT	CCCCACTTGATTTTGGAGGGA
IL6	GGTACATCCTCGACGGCATCT	GTCCCTCTTTGCTGCTTTCAC
CCL2	CAGCCAGATGCAATCAATGC	GCACTGAGATCTTCCTATTGGTGAA
VEGFA	CTACCTCCACCATGCCAAGT	GCAGTAGCTGCGCTGATAGA
TNFA	GGAGAAGGGTGACCGACTCA	CTGCCCAGACTCGGCAA
Leptin	GAAGACCACATCCACACACG	AGCTCAGCCAGACCCATCTA

Supplementary Table 4: List of mouse primers used for real-time PCR

Gene	Forward Primer sequence [5'-3'] Oligo	Reverse Primer sequence [5'-3'] Oligo
18S rRNA	GTAACCCGTTGAACCCCATT	CCATCCAATCGGTAGTAGCG
Cd36	CCTTAAAGGAATCCCCGTGT	TGCATTTGCCAATGTCTAGC
Gapdh	CATTGTGGAAGGGCTCATGA	TCTTCTGGGTGGCAGTGATG
Il-6	AAAGAGTTGTGCAATGGCAATTCT	AAGTGCATCATCGTTGTTCATACA
Ccl2	GTTGGCTCAGCCAGATGCA	AGCCTACTCATTGGGATCATCTTG
Vegfa	CCTCCTCAGGGTTTCGGGAACCA	ACCCAAAGTGCTCCTCGAAGGATC
Tnfa	CATCTTCTCAAAATTCGAGTGACAA	TGGGAGTAGACAAGGTACAACCC
Fabp4	AAGGTGAAGAGCATCATAACCC	TCACGCCTTTCATAACACATTCC
Pparg	GGAAGACCACTCGCATTCCTT	GTAATCAGCAACCATTGGGTCA
Srebp-1c	GATCAAAGAGGAGCCAGTGC	TAGATGGTGGCTGCTGAGTG
Fasn	AGAGATCCCGAGACGCTTCT	GCCTGGTAGGCATTCTGTAGT
Scd1	TTCTTACACGACCACCACCA	CCGAAGAGGCAGGTGTAGAG
Hsl/Lipe	TCTATGCGCAGGAGTGTGTC	TTGACATCAGAGGGTGTGGA
Atgl	CAACGCCACTCACATCTACGG	TCACCAGGTTGAAGGAGGGAT
Acaca	CTCCAGGACAGCACAGATCA	GCCGAAACATCTCTGGGATA
Leptin	CTCATGCCAGCACTCAAAAA	AGCACCACAAAACCTGATCC
Adiponectin	AGACCTGGCCACTTTCTCCT	ATCCAACCTGCACAAGTTCC
Cebpa	CAAGAACAGCAACGAGTACCG	GTCACTGGTCAACTCCAGCAC
Cebpb	ATCGACTTCAGCCCCTACCT	GGCTCACGTAACCGTAGTCG
Cebpd	CGACTTCAGCGCCTACATTGA	GAAGAGGTCGGCGAAGAGTT
Acly	CAGCCAAGGCAATTTCAGAGC	CTCGACGTTTGATTAACTGGTCT
Acat1	CTGGGCGCAGGTTTACCTAT	GGTGTTGCTCCTCTGCTCAT
Acat2	ATTGTTGAAAGGTGGGCAGC	GGTAACATCCCATCCCGTCA
Hadh	TCGTGAACCGACTCTTGGTG	TCTTCCTTAGACGCATCGCC
Crot	ATTGGCTGGAAGAGTGGTGG	GAGTCCCTTCCTTTGGAGGC
Acaa2	GGGGCCTTCTCAAGGACTTC	ACATTGCCCACGATGACACT
Acaa1	AGGCCCTCTAAAGACCCCAT	GGTGGGTCCTACCTACTCGT
Cpt1a	GGACTCCGCTCGCTCATT	GAGATCGATGCCATCAGGGG
Cpt1b	CCTGGGATGCGTGTAGTGTT	CCTGGGATGCGTGTAGTGTT
Slc25a20	CATGTGCCTGGTGTTTGTGG	GGTGGCTGTCCAGACAAACT