

Fig SF1. Inhibition of activation of PKC ζ prevents hypoxia-induced invasion. (A-B) A549 cells were exposed to normoxia or hypoxia for the indicated time periods. The whole cell lysates (A) or the total membrane (TM) fractions (B) were prepared, and aliquots with the same amount of protein were subjected to SDS-PAGE followed by Western blot analysis for Thr-410-phosphorylated PKC ζ (pPKC ζ), PKC ζ , and E-cadherin. The amount of pPKC ζ and PKC ζ were normalized to those of PKC ζ and E-cadherin, respectively. *, $p < 0.05$; ** and ##, $p < 0.01$. C) A549 cells were cultured on BD Matrigel invasion chambers, pretreated with Bisindolylmaleimide I (Bis) at the doses of 1 and 10 μ M, and exposed to normoxia (N) or hypoxia (H) for 48 hours for the measurement of invasion. Experiments were carried out in triplicates and repeated three times. The results were compared to that of A549 cells and data are expressed as mean \pm SEM. **, $p < 0.01$.

Supplemental Fig SF2

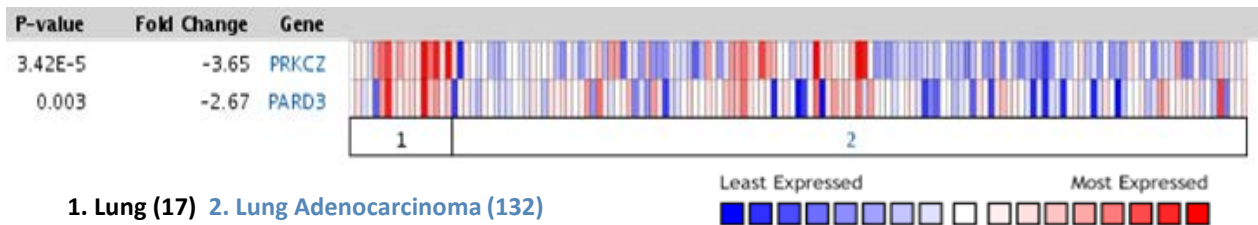


Fig SF2. Lung adenocarcinoma cells express reduced levels of PKC ζ /Pard3/Pard6. Comparison of Pard3 (gene name PARD3) and PKC ζ (gene name PRKCZ) mRNA expression in tissues of lung adenocarcinoma vs. Normal. The results were obtained using datasets published by Bhattacharjee et al. ²⁹ and analysis tools provided by OncoPrint™ (Compendia Bioscience, Ann Arbor, MI).

Supplemental table ST1: Suppression of Pard3 alters gene expression in lung adenocarcinoma cells.

GO Term	Count	%	Genes
GO:0009611~response to wounding	35	9.85915	F2RL2, CXCL1, PPARA, CCL2, CXCL3, CXCL2, C1R, BDKRB2, FOS, MAP3K1, PAX7, CFH, APOH, SERPINA3, MGLL, IL1B, CD24, CFI, IL1A, SCG2, FN1, NFKBIZ, IL8, CFB, NOX1, C4BPA, SOD2, PLSCR1, HNF4A, F5, AOX1, VCAN, IGFBP1, CD14, TM4SF4
GO:0006954~inflammatory response	23	6.47887	CXCL1, NFKBIZ, CCL2, IL8, CFB, CXCL3, CXCL2, NOX1, C1R, C4BPA, BDKRB2, FOS, AOX1, SERPINA3, CFH, MGLL, IL1B, CD24, CFI, CD14, IL1A, SCG2, FN1
GO:0042127~regulation of cell proliferation	37	10.4225	VIP, CXCL1, FGFR2, RARRES3, RBP4, RARRES1, CCL2, CXCL5, IGFBP7, MMP7, BDKRB2, VCAM1, MYOCD, APOE, TGM2, APOH, IL1B, KRT4, CD24, LTB, FGFBP1, IL1A, SCG2, CDC7, TXNIP, IL8, TBX2, NOX1, SOD2, SUZ12, NRAS, CD38, HNF4A, IL12A, MUC5AC, IGFBP3, TM4SF4
GO:0006955~immune response	34	9.57746	PSMB10, CXCL1, IL1R2, IFIH1, CCL2, CXCL5, IFITM2, CXCL3, SUSD2, CXCL2, CD70, OAS1, IL32, C1R, CFH, IL1B, CD24, CFI, LTB, IL1A, FYB, EXO1, IL8, BST1, CFB, PRG4, C4BPA, PSMB8, HLA-F, TNFSF10, IL12A, GBP3, IFI6, CD14
GO:0008285~negative regulation of cell proliferation	22	6.19718	CXCL1, RBP4, RARRES3, RARRES1, IL8, IGFBP7, BDKRB2, SOD2, HNF4A, APOE, IL12A, APOH, IL1B, MUC5AC, CD24, KRT4, IGFBP3, LTB, FGFBP1, TM4SF4, IL1A, SCG2
GO:0006952~defense response	29	8.16901	CXCL1, IFIH1, CCL2, CXCL3, CXCL2, IL32, C1R, BDKRB2, FOS, LGALS3BP, CFH, SERPINA3, IL1B, MGLL, CD24, CFI, MX1, IL1A, SCG2, FN1, NFKBIZ, IL8, CFB, NOX1, C4BPA, INHBB, AOX1, IL12A, CD14
GO:0006959~humoral immune response	9	2.53521	EXO1, PSMB10, CCL2, BST1, CFB, CFH, C1R, C4BPA, CFI
GO:0042981~regulation of apoptosis	32	9.01408	IFIH1, CCL2, CD70, BDKRB2, AHRR, CASP4, APOE, MAP3K1, PAX7, TGM2, APOH, IL1B, CD24, MX1, LTB, IL1A, ANGPTL4, SCG2, TXNIP, SOCS2, WRN, IFI16, SOD2, CIDEA, CD38, NRAS, TNFSF10, IL12A, MUC5AC, IGFBP3, IFI6, CAMK1D
GO:0043067~regulation of programmed cell death	32	9.01408	IFIH1, CCL2, CD70, BDKRB2, AHRR, CASP4, APOE, MAP3K1, PAX7, TGM2, APOH, IL1B, CD24, MX1, LTB, IL1A, ANGPTL4, SCG2, TXNIP, SOCS2, WRN, IFI16, SOD2, CIDEA, CD38, NRAS, TNFSF10, IL12A, MUC5AC, IGFBP3, IFI6, CAMK1D
GO:0010941~regulation of cell death	32	9.01408	IFIH1, CCL2, CD70, BDKRB2, AHRR, CASP4, APOE, MAP3K1, PAX7, TGM2, APOH, IL1B, CD24, MX1, LTB, IL1A, ANGPTL4, SCG2, TXNIP, SOCS2, WRN, IFI16, SOD2, CIDEA, CD38, NRAS, TNFSF10, IL12A, MUC5AC, IGFBP3, IFI6, CAMK1D
GO:0002526~acute inflammatory response	9	2.53521	CFB, CFH, SERPINA3, IL1B, C1R, C4BPA, CFI, IL1A, FN1
GO:0048584~positive regulation of response to stimulus	14	3.94366	POLR3G, IL8, CFB, C1R, C4BPA, NTRK3, ERCC8, IL12A, CFH, TGM2, IL1B, CD24, CFI, SCG2
GO:0050900~leukocyte migration	7	1.97183	VCAM1, CCL2, IL8, CXCL3, IL1B, CD24, SCG2
GO:0016477~cell migration	15	4.22535	CCL2, S100P, IL8, CXCL3, NOX1, TBX1, VCAM1, PRSS3, IL12A, IL1B, VCAN, CD24, CEACAM1, FN1, SCG2
GO:0009991~response to extracellular stimulus	13	3.66197	RBP4, PPARA, CCL2, CFB, IGFBP7, ASL, SOD2, ASGR1, FOS, CD38, RPS19, MYOCD, IL1B
GO:0042060~wound healing	12	3.38028	F2RL2, PLSCR1, PPARA, HNF4A, F5, MAP3K1, PAX7, APOH, IL1B, IGFBP1, TM4SF4, FN1
GO:0051605~protein maturation by peptide bond cleavage	8	2.25352	CFB, PRSS3, CFH, APOH, C1R, C4BPA, CFI, PCSK5
GO:0009725~response to hormone stimulus	17	4.78873	TXNIP, PPARA, RBP4, CCL2, SOCS2, IGFBP7, TIMP4, NPY1R, NR4A3, ASL, CD38, PRKAR2B, FOS, KRT19, IL1B, CD24, IGFBP1
GO:0009628~response to abiotic stimulus	17	4.78873	TXNIP, RBP4, CCL2, IGFBP7, NOX1, WRN, BDKRB2, GPR98, SOD2, FOS, NRAS, ERCC8, DIO2, MAP3K1, IL12A, IL1B, LTB
GO:0031099~regeneration	7	1.97183	CCL2, PAX7, APOH, VCAN, NR4A3, IGFBP1, TM4SF4
GO:0048870~cell motility	15	4.22535	CCL2, S100P, IL8, CXCL3, NOX1, TBX1, VCAM1, PRSS3, IL12A, IL1B, VCAN, CD24, CEACAM1, FN1, SCG2
GO:0051674~localization of cell	15	4.22535	CCL2, S100P, IL8, CXCL3, NOX1, TBX1, VCAM1, PRSS3, IL12A, IL1B, VCAN, CD24, CEACAM1, FN1, SCG2
GO:0030593~neutrophil chemotaxis	4	1.12676	CCL2, IL8, CXCL3, IL1B

Supplemental Table ST2. Primer sequences for qRT-PCR

Gene	Forward 5' to 3'	Reverse 5' to 3'	Application
AHRR	CTGCCTCTTGGTACATCACGTAAT	CGTTGTGTGTTTCTCTGTACTIONCCA	qRT-PCR
APOE	GCGTTGCTGGTCACATTCTCT	TCTGTCTCCACCGCTTGCT	qRT-PCR
CASP4	CACACGCCTGGCTCTCATC	CCATTCTCGGAGGCAGAT	qRT-PCR
CEACAM1	TGGCCCTGGTTGCTCTGA	CGGTCTTCCCAGAAATGCA	qRT-PCR
CEACAM6	CCAGGGCCCCGCATACA	ATCAGCAGGGATGCATTGG	qRT-PCR
CEACAM7	CAGGGCCCCGCACACAA	CTGGATCAGCAGGGTTCCA	qRT-PCR
CCL2	CGCCTCCAGCATGAAAGTCT	GGAATGAAGGTGGCTGCTATG	qRT-PCR
CXCL1	CCACTGCGCCCAAACC	GCAAGCTTTCCGCCATT	qRT-PCR
CXCL2	AAGGAGGCCCTGCCCTTA	GTGGCCTCTGCAGCTGTGT	qRT-PCR
CXCL3	GCATCCCCATGGTTTACAG	TCAGTTGGTGTCTCCCTTGT	qRT-PCR
CXCL5	TCCCCTACTCACAGCTTTGG	TCGTCTTCTGCAATCTCTAACC	qRT-PCR
FGFR2	TGCACAAGCTGACCAAACGT	CTGGACTCAGCCGAAACTGTT	qRT-PCR
FN1	CCTTCATGGCAGCGGTTT	AGCGTCCTAAAGACTCCATGATCT	qRT-PCR
IFIH1	TGGTCGAGCCAGAGCTGAT	ACTCTGAACCACTGTGAGCAA	qRT-PCR
IGFBP1	GGGACGCCATCAGTACCTATG	TTTTTTGATGTTGGTGACATGGA	qRT-PCR
IGFBP7	TCACTGGTGCCAGGTGTAC	TGAGGACAGGTGTCGGGATT	qRT-PCR
IL8	GGCAGAGCTGTGCCTGTTG	TGGCAAACTGCACCTGTTG	qRT-PCR
IL1B	TCAGCCAATCTTCATTGCTCAA	TGGCGAGCTCAGGTACTTCTG	qRT-PCR
IL12A	CCTTCACTCCCAAAACCT	TGTCTGGCCTTCTGGAGCAT	qRT-PCR
MAP3K1	CAAACCGCCGTGTTAACAAA	GGCCCTATCTGCTGCAGTAAGT	qRT-PCR
MMP7	GCTGGCTCATGCCTTTGC	TCCTCATCGAAGTGAGCATCTC	qRT-PCR
NOX1	TTGCAGCCGCACACTGA	GGCCACCAGCTTGTGGAA	qRT-PCR
PAX7	GAGGACGACGGCGAAAAGA	CCCTTTGTCGCCAGGAT	qRT-PCR
PPARA	AACATCCAAGAGATTTGCAATC	CCGTAAAGCCAAAGCTTCCA	qRT-PCR
S100P	CAGCCATGGGCATGATCA	CCCTCGCTGCCCGAATAT	qRT-PCR
SFRP5	CCCTACTGGAGGGTGTTCAC	TCCGTGCCCATCCCTTAG	qRT-PCR
SOD2	CGCGGCCTACGTGAACA	CCAACGCCTCTGGTACTTC	qRT-PCR
TM4SF4	CAAGGACTCTCTGGCCAAAAA	GCTCTCACTGCCTCTTCA	qRT-PCR
VCAM1	CACTCCGCGGTATCTGCAT	TGTGCCTGGGAGGGTATTCA	qRT-PCR
VCAN	GCAACAGCCGAGAACATTAGG	GGGCTGGCCGAAAGATCTT	qRT-PCR