

Table 2. Top 7 pathways enriched in common genes induced by overexpression of CXCL12 and PGK1 in NSF

Pathways	Gene Symbol	Gene Title	CXCL12	PGK1
			Fold Change	Fold Change
Apoptosis	CADM1	cell adhesion molecule 1	28.89	25.15
	BTG1	B-cell translocation gene 1, anti-proliferative	28.22	29.83
	NR4A2	nuclear receptor subfamily 4, group A, member 2	22.2	16.89
	TRPS1	trichorhinophalangeal syndrome 1	21.25	14.7
	EDIL3	EGF-like repeats and discoidin I-like domains 3	21.17	17.39
	MAPK10	mitogen-activated protein kinase 10	20.27	19.76
	ADRB2	adrenergic, beta-2-, receptor, surface	19.67	20.56
	ITGB8	integrin, beta 8	17.2	14.26
	POU4F1	POU class 4 homeobox 1	16.91	10.93
	ABCA1	ATP-binding cassette, sub-family A (ABC1), member 1	12.95	7.61
	CD2	CD2 molecule	12.33	9.88
	EDAR	ectodysplasin A receptor	11.73	13.88
	ERCC6	excision repair cross-complementing group 6	11.23	8.4
	IFNG	interferon, gamma	11.22	7.45
	NR4A3	nuclear receptor subfamily 4, group A, member 3	11.12	9
	TP63	tumor protein p63	11.08	11.42
	CD40	CD40 molecule, TNF receptor superfamily member 5	10.97	9.25
	PPP3CC	Protein phosphatase 3, catalytic subunit, gamma isoform	10.72	12.15
	RYBP	RING1 and YY1 binding protein	10.24	5.8
	COL4A3	collagen, type IV, alpha 3 (Goodpasture antigen)	9.88	8.43
	ACTC1	actin, alpha, cardiac muscle 1	9.57	12.4
	CSNK1A1	casein kinase 1, alpha 1	9.19	11.27
	EIF4G2	eukaryotic translation initiation factor 4 gamma, 2	8.8	7.38
	XIAP	X-linked inhibitor of apoptosis	8.64	9.14
	PML	promyelocytic leukemia	8.35	9.14
	HIPK3	homeodomain interacting protein kinase 3	8.21	9.87
	TNFRSF9	tumor necrosis factor receptor superfamily, member 9	8.11	6.8
	FCER1G	Fc fragment of IgE, high affinity I, receptor for; gamma polypeptide	7.94	11.52
	ADORA1	adenosine A1 receptor	7.72	7.03
	PPP3R1	protein phosphatase 3, regulatory subunit B, alpha isoform	7.61	11.94
	GAL	galanin prepropeptide	7.55	8.29
	JUN	Jun oncogene	7.28	12.36
	BCL6	B-cell CLL/lymphoma 6 (zinc finger protein 51)	7.1	3.88
	BAX	BCL2-associated X protein	6.39	7.94
	MMP9	matrix metalloproteinase 9	6.08	6.6
	CASP2	caspace 2	6.06	2.78
	RTEL1	regulator of telomere elongation helicase 1	5.92	5.07
	VEGFA	vascular endothelial growth factor A	5.9	5.82
	CUL3	cullin 3	5.56	6.5
	BRE	brain and reproductive organ-expressed (TNFRSF1A modulator)	4.53	4.09
	ZFAND5	zinc finger, AN1-type domain 5	4.33	4.02
	PPP2CA	protein phosphatase 2, catalytic subunit, alpha isoform	3.89	4.03
	CSNK1A1	casein kinase 1, alpha 1	3.81	3.26
	SIAH1	seven in absentia homolog 1 (Drosophila)	3.63	3.39
	CUL1	cullin 1	3.61	3.55
	PTPN6	protein tyrosine phosphatase, non-receptor type 6	3.36	2.25
	ACVR1	activin A receptor, type I	3.28	4.68
	DYRK2	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 2	2.98	4.91
	MAGED1	melanoma antigen family D, 1	2.98	2.78
	E2F1	E2F transcription factor 1	2.57	2.51
	PDCD10	programmed cell death 10	2.52	2.95
	SGPL1	sphingosine-1-phosphate lyase 1	2.43	2.73
	ATG5	ATG5 autophagy related 5 homolog (S. cerevisiae)	2.35	2.5
	EP300	E1A binding protein p300	2.17	3.41
	TAX1BP1	Tax1 (human T-cell leukemia virus type I) binding protein 1	2.14	2.48

Cell Cycle	CITED2	Cbp/p300-interacting transactivator, 2	93.8	75.75
	FGD1	FYVE, RhoGEF and PH domain containing 1	34.05	32.77
	CADM1	cell adhesion molecule 1	28.89	25.15
	BTG1	B-cell translocation gene 1, anti-proliferative	28.22	29.83
	MUSK	muscle, skeletal, receptor tyrosine kinase	15.02	15.34
	UBN1	ubiquitin 1	14.59	12.74
	EGFR	epidermal growth factor receptor	13.6	8.87
	RASSF2	Ras association (RalGDS/AF-6) domain family member 2	13.18	12.24
	ZER1	zer-1 homolog (C. elegans)	13.02	9.38
	FBXL7	F-box and leucine-rich repeat protein 7	12.91	8.11
	UBE2L6	ubiquitin-conjugating enzyme E2L 6	12.74	13.94
	HERC3	hect domain and RLD 3	12.09	6.18
	hCG_1998957	major histocompatibility complex, class II	11.93	15.31
	EDAR	ectodysplasin A receptor	11.73	13.88
	CDC2L5	cell division cycle 2-like 5	11.24	13.32
	CD40	CD40 molecule, TNF receptor superfamily member 5	10.97	9.25
	NHLH2	nescient helix loop helix 2	10.93	12.87
	IFNA5	interferon, alpha 5	10.2	7.85
	CHFR	checkpoint with forkhead and ring finger domains	9.63	10.26
	CSNK1A1	casein kinase 1, alpha 1	9.19	11.27
	DMBT1	deleted in malignant brain tumors 1	9.17	11.55
	DDX3X	DEAD (Asp-Glu-Ala-Asp) box polypeptide 3, X-linked	9.05	6.54
	PTP4A3	protein tyrosine phosphatase type IVA, member 3	8.89	9.27
	REC8	REC8 homolog (yeast)	8.85	9.01
	EIF4G2	eukaryotic translation initiation factor 4 gamma, 2	8.8	7.38
	PRKY	protein kinase, Y-linked	8.75	6.91
	PER1	period homolog 1 (Drosophila)	8.67	7.44
	XIAP	X-linked inhibitor of apoptosis	8.64	9.14
	PML	promyelocytic leukemia	8.35	9.14
	LOH11CR2A	loss of heterozygosity, 11, chromosomal region 2, gene A	8.31	9.03
	HIST1H4G	histone cluster 1, H4g	8.07	12.14
	MYL4	myosin, light chain 4, alkali; atrial, embryonic	7.96	5.24
	XIST	X (inactive)-specific transcript (non-protein coding)	7.53	12.13
	FOXC1	forkhead box C1	7.5	6.58
	H2AFX	H2A histone family, member X	7.18	5.66
	BCL6	B-cell CLL/lymphoma 6 (zinc finger protein 51)	7.1	3.88
	PP1G	peptidylprolyl isomerase G (cyclophilin G)	7.06	8.36
	UBE2L3	ubiquitin-conjugating enzyme E2L 3	6.82	5.54
	BAX	BCL2-associated X protein	6.39	7.94
	UBE2D4	ubiquitin-conjugating enzyme E2D 4 (putative)	6.04	5.37
	HIST2H2BE	histone cluster 2, H2be	5.99	6.36
	DGKA	diacylglycerol kinase, alpha 80kDa	5.98	6.92
	FBXW2	F-box and WD repeat domain containing 2	5.71	5.53
	HMGA2	high mobility group AT-hook 2	5.62	7.86
	RAP1A	RAP1A, member of RAS oncogene family	5.58	3.37
	CUL3	cullin 3	5.56	6.5
	BRCC3	BRCA1/BRCA2-containing complex, subunit 3	5.46	6.73
	JARID1A	jumonji, AT rich interactive domain 1A	5.38	4.97
	UBE2Q1	ubiquitin-conjugating enzyme E2Q family member 1	5.26	6.82
	CBLB	Cas-Br-M (murine) ecotropic retroviral transforming sequence b	5.12	4.09
	ARG2	arginase, type II	5.01	3.95
	DDX5	DEAD (Asp-Glu-Ala-Asp) box polypeptide 5	4.87	4.55
	FANCC	Fanconi anemia, complementation group C	4.76	3.59
	CNOT3	CCR4-NOT transcription complex, subunit 3	4.72	4.7
	MID2	midline 2	4.72	4.12
	SOCS6	suppressor of cytokine signaling 6	4.7	4.91
	PARD6A	par-6 partitioning defective 6 homolog alpha (C. elegans)	4.67	4.33
	RANBP9	RAN binding protein 9	4.65	3.52
	BRE	brain and reproductive organ-expressed (TNFRSF1A modulator)	4.53	4.09
	GCAT	glycine C-acetyltransferase (2-amino-3-ketobutyrate coenzyme A ligase)	4.51	3.35
	STAG2	stromal antigen 2	4.48	3.29

MAPK	ADRB2	adrenergic, beta-2-, receptor, surface	19.67	20.56
	DUSP9	dual specificity phosphatase 9	11.39	15.37
	MAP2K7	mitogen-activated protein kinase kinase 7	7.41	8.93
	PPP2CA	protein phosphatase 2 (formerly 2A), catalytic subunit, alpha isoform	3.89	4.03
Metastasis	MTA1	metastasis associated 1	9.76	10.93
	RSRC2	arginine/serine-rich coiled-coil 2	5.38	5.55
	UTP20	UTP20, small subunit (SSU) processome component	3.02	2.58
	CD44	CD44 molecule (Indian blood group)	2.14	2.95
	MMP2	matrix metalloproteinase 2	4.32	6.43
MMP3	matrix metalloproteinase 3	6.21	3.65	
Proliferation	FILIP1L	filamin A interacting protein 1-like	157	127.13
	SDF-1	stroma derived factor-1	11.2	13.2
	CADM1	cell adhesion molecule 1	28.89	25.15
	BTG1	B-cell translocation gene 1, anti-proliferative	28.22	29.83
	ADRB2	adrenergic, beta-2-, receptor, surface	19.67	20.56
	ADAMTS1	ADAM metalloproteinase with thrombospondin type 1 motif, 1	16.24	10.2
	MAS1	MAS1 oncogene	15.41	14.33
	PURA	purine-rich element binding protein A	15.28	16.15
	KRT2	keratin 2	15.26	16.57
	EGFR	epidermal growth factor receptor	13.6	8.87
	FGA	fibrinogen alpha chain	12.23	7.3
	CDC2L5	cell division cycle 2-like 5	11.24	13.32
	TSPAN31	tetraspanin 31	10.85	10.48
	COL4A3	collagen, type IV, alpha 3	9.88	8.43
	FURIN	furin	9.56	9.21
	HCLS1	hematopoietic cell-specific Lyn substrate 1	9.38	9.09
	SLAMF1	signaling lymphocytic activation molecule family member 1	8.45	11.43
	TNFRSF9	tumor necrosis factor receptor superfamily, member 9	8.11	6.8
	GAL	galanin prepropeptide	7.55	8.29
	FOXC1	forkhead box C1	7.5	6.58
	BCL6	B-cell CLL/lymphoma 6	7.1	3.88
	CUL3	cullin 3	5.56	6.5
	RSRC2	arginine/serine-rich coiled-coil 2	5.38	5.55
	NDP	Norrie disease	5.02	5.58
	RPS27	ribosomal protein S27	4.86	6.76
	KIF2C	kinesin family member 2C	3.93	4.33
	CSK	c-src tyrosine kinase	3.75	2.79
	HHEX	hematopoietically expressed homeobox	3.66	3.5
	CUL1	cullin 1	3.61	3.55
	TOB1	transducer of ERBB2, 1	3.36	3.04
	PTPN6	protein tyrosine phosphatase, non-receptor type 6	3.36	2.25
	S100A6	S100 calcium binding protein A6	3.34	3.8
	KLF4	Kruppel-like factor 4 (gut)	3.17	3.45
	NCK1	NCK adaptor protein 1	3.11	7.44
UTP20	UTP20, small subunit (SSU) processome component	3.02	2.58	
MAGED1	melanoma antigen family D, 1	2.98	2.78	
IFITM1	interferon induced transmembrane protein 1	2.93	4.23	
ACVR2A	activin A receptor, type IIA	2.63	3.21	
CGRRF1	cell growth regulator with ring finger domain 1	2.63	2.03	
E2F1	E2F transcription factor 1	2.57	2.51	

Wnt	DKK1	dickkopf homolog 1	10.2	8.19
	CSNK1A1	casein kinase 1, alpha 1	9.19	11.27
	NLK	nemo-like kinase	8.41	7.32
	CSNK1G1	casein kinase 1, gamma 1	7.88	8.49
	PPP2CA	protein phosphatase 2, catalytic subunit, alpha isoform	3.89	4.03
	CSNK1A1	casein kinase 1, alpha 1	3.81	3.26
	HHEX	hematopoietically expressed homeobox	3.66	3.5
	CELSR2	cadherin, EGF LAGseven-pass G-type receptor 2	2.16	2.95
	TLE1	transducin-like enhancer of split 1	2.13	2.41
Focal adhesion	VIM	vimentin	518.7	589.7
	TLN1	talin 1	12.62	13.29
	SMARCA1	SWI/SNF related, matrix associated, actin dependent regulator of chromatin, member 1	11.41	12.02
	MMP14	matrix metalloproteinase 14	8.32	6.75
	CAV2	caveolin 2	2.21	2.46
