

Supplementary Tables to Viemann et al.

Table S1

Ni²⁺-induced gene expression in human primary endothelial cells (HUVEC).

Table S2

Ni²⁺-mediated down-regulation of gene expression in primary human endothelial cells (HUVEC).

TABLE S1

Ni²⁺-induced gene expression in human primary endothelial cells (HUVEC)

A. Genes up-regulated by Ni²⁺	Affymetrix identifier	Gene symbol	Fold-change	p-value	Induction by TNFα*	HIF-1α-dependent regulation in ECs and other cells (<i>in italics</i>) as established in the literature
Chemokines / cytokines						
CXCL2 (Gro-beta)	209774	CXCL2	36.0	0,0000000070	Yes	
CXCL8 (IL-8)	211506	IL8	33.0	0,000000041	Yes	
CXCL1 (Gro-alpha)	204470	CXCL1	23.7	0.000000001	Yes	
CXCL6 (GCP-2)	206336	CXCL6	21.7	0.00000005	Yes	
IL-6	205207	IL6	14.9	0.000000087		
CXCL5	214974	CXCL5	12.8	0.0000002	Yes	
CCL2 (MCP-1)	216598	CCL2	11.0	0.0000000024	Yes	
Inhibin beta A (activin beta-A chain)	210511	INHBA	5.4	0.0000002	Yes	Blood 105:659-669 (2005)
growth differentiation factor 15	221577	GDF15	2.5	0.00009	Yes	
Cell surface receptors						
E-selectin	206211	SELE	43.3	0.0000000023	Yes	
VCAM-1	203868	VCAM1	39.4	0,0000000039	Yes	
ICAM-1	202638	ICAM1	30.7	0.00000000003	Yes	
chemokine orphan receptor 1	212977	CMKOR1	7.1	0,00000008	Yes	Blood 105:659-669 (2005)
Sialyltransferase 1 (beta-galactoside alpha-2,6-sialyltransferase) (CD75)	201998	SIAT1	7.1	0.000000088	Yes	
Interferon gamma receptor 1	202727	IFNGR1	3.1	0.0000001		
Interferon gamma receptor 2 (interferon gamma transducer 1)	201642	IFNGR2	2.8	0.0000001	Yes	
TNF receptor superfamily, member 10b (TRAIL-R2, DR5)	209294	TNFRSF10B	2.8	0.001		Blood 105:659-669 (2005)

Coagulation factor II (thrombin) receptor like-1 (Proteinase activated receptor 2)	206429	F2RL1	2.6	0.000001		
Roundabout, axon guidance receptor, homolg 1 (Drosophila) (neuronal cell adhesion molecule family of receptor)	213194	ROBO1	2.8	0.00000006		
Inflammation / immune response						
Prostaglandin-endoperoxide synthase 2 (Cox2)	204748	PTGS2	11.6	0.0000027		
TNF-alpha-induced protein 2	202510	TNFAIP2	6.2	0.000003	Yes	
DnaJ (Hsp40) homolog, subfamily B, member 9	202843	DNAJB9	3.1	0.005		
DnaJ (Hsp40) homolg subfamily B, member 6	209015	DNAJB6	2.5	0.000003		
Signaling / transcription / translation						
HIF-responsive RTP801 (DNA-damage-inducible transcript 4; transcriptional target of p53)	202887	DDIT4	10.7	0.0000000003		<i>Mol Cell Biol 22:2283-2293 (2002)</i>
HIV type 1 enhancer binding protein 2	212642	HIVEP2	7.7	0.0000045	Yes	Blood 105:659-669 (2005)
Nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha (I κ B α)	201502	NFKBIA	7.3	0.0000017	Yes	
Activating transcription factor 3	202672	ATF3	7.1	0.0000011		
Jagged 1	209098	JAG1	5.3	0.0000097	Yes	
CCAAT/enhancer binding protein (C/EBP), beta	212501	CEBPB	4.3	0.000004		
Ephrin-A1 (TNF-alpha-induced protein 4)	202023	EFNA1	4.1	0.000001	Yes	
Friend of GATA2 (TF or transcriptional coactivator of GATA-2)	219778	ZFPM2	4.1	0.0000056		
FOS-related antigen 2 (FRA 2) (formation of transcription factor complex AP-1)	218880	FOSL2	4.1	0.0000006		
Nuclear factor, interleukin 3 regulated (transcriptional repressor)	203574	NFIL3	3.9	0.00000069		

Egl nine homolog 1 (C. elegans) (negative regulation of HIF by prolyl hydroxylation)	221497	EGLN1	3.7	0.00001		Blood 105:659-669 (2005)
KIAA0530 protein (zinc finger protein 292; TF)	212368	ZNF292	3.6	0.0002		Blood 105:659-669 (2005)
MAX interacting protein 1 (TF)	202364	MXI1	3.2	0.0002		Blood 105:659-669 (2005)
Cysteinyl-tRNA synthetase (translation)	212971	CARS	3.2	0.0000004		
Phosphatidic acid phosphatase type 2B (signal transduction; production of diacylglycerol))	212230	PPAP2B	3.2	0.000008		
Forkhead box O3A (TF)	204131	FOXO3A	3.1	0.0001		
CCAAT/enhancer binding protein (C/EBP), gamma	204203	CEBPG	3.0	0.0000003		
RAR-related orphan receptor A (steroid hormone nuclear receptor superfamily; transcription activating factor))	210479	RORA	3.0	0.000009		
Jun B proto-oncogene	201473	JUNB	3.0	0.002		
Nuclear factor of kappa light polypeptide gene enhancer in B-cells 1(p105)	209239	NFKB1	2.8	0.000001		
BTB and CNC homology 1, basic leucine zipper transcription factor 1	204194	BACH1	2.7	0.001		
GATA binding protein 6 (TF)	210002	GATA6	2.8	0.0005		
Small nuclear RNA activating complex, polypeptide 1, 43kD (TF)	205443	SNAPC1	2.6	0.0004		
Down syndrome critical region gene 1 (calcineurin-interacting protein, inhibitory)	208370	DSCR1	2.6	0.0003		
Methionine-tRNA synthetase (translation)	201475	MARS	2.6	0.00003		
MAP kinase phosphatase 3 (MKP3)	208893	DUSP6	2.5	0.0002		Blood 105:659-669 (2005)
Phosphatase and tensin homolog (mutated in multiple advanced cancers 1) /tumor suppressor; destabilization of HIF1A)	211711	PTEN	2.5	0.00002		
Optineurin (TF)	202074	OPTN	2.5	0.00004		
Protein tyrosine phosphatase, receptor type, K	203038	PTPRK	2.5	0.00001		

Protein tyrosine phosphatase, receptor type, B	205846	PTPRB	2.5	0.000006		Blood 105:659-669 (2005)
Interferon regulatory factor 2 (repressor of IRF 1 (transcriptional activator of IF type 1 genes and IF-inducible genes)	203275	IRF2	2.5	0.000016		
Apoptosis / cell proliferation						
Angiopoietin-like 4 (proangiogenic)	221009	ANGPTL4	16.3	0.0000033		Blood 105:659-669 (2005)
Heme oxygenase 1 (endothelial cell cycle progression)	203665	HMOX1	15.0	0.0000004		Am J Physiol 277:L1133-1141 (1999); <i>J Biol Chem</i> 272:5375-5381 (1997)
VEGF	210512	VEGF	12.7	0.00000013		Blood 105:659-669 (2005)
TNF-alpha-induced protein 3 (A20)	202644	TNFAIP3	11.5	0.0000000069	Yes	
TNF-induced protein (potentially anti-apoptotic)	210260	TNFAIP8	6.0	0.000016		
Nef-associated factor 1 (Naf1)	207196	TNIP1	5.8	0.0000004	Yes	
Cyclin G2	202770	CCNG2	4.0	0.000078		Blood 105:659-669 (2005)
BCL2/adenovirus E1B 19kD interacting protein 3 (HIF-1 α -induced; antiapoptotic by binding of NIP 3)	201848	BNIP3	3.9	0.000003		Cancer Res 61:6669-6673 (2001)
TRAIL (Tumor necrosis factor (ligand) superfamily. member 10)	202687	TNFSF10	3.6	0.00002		
CDC-like kinase 1 (regulation of cell cycle)	214683	CLK1	3.2	0.00003		
VEGF C	209946	VEGFC	3.0	0.0001		Blood 105:659-669 (2005)
B-cell translocation gene 1(cell cycle control, anti-proliferative)	200920	BTG1	2.9	0.000003		
Protein phosphatase 1, regulatory (inhibitor) subunit 15A (increased after stressful growth arrest conditions)	202014	PPP1R15 A	2.8	0.00003		
Triple functional domain (PTPRF interacting) (may play a key role in several signaling pathways that control cell proliferation)	209011	TRIO	2.6	0.003		Blood 105:659-669 (2005)

Metabolism						
SOD-2	216841	SOD2	20.7	0.00000056	Yes	
Asparagine synthetase	205047	ASNS	11.2	0.00013		
Phosphoserine aminotransferase	220892	PSAT1	5.5	0.0000027		
6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3	202464	PFKFB3	4.2	0.0000008		
Alpha (1,6)-fucosyltransferase (Spermidine/spermin N1-acetyltransferase)	203988	FUT8	3.3	0.0008		
Meningioma expressed antigen 5 (hyaluronidase)	200898	MGEA5	3.2	0.000003		
VLDL receptor	209822	VLDLR	2.9	0.0000002		Blood 105:659-669 (2005)
Methylene tetrahydrofolate dehydrogenase (NAD+ dependent)	201761	MTHFD2	2.7	0.000007		
Serine hydroxymethyltransferase 2 (mitochondrial)	214437	SHMT2	2.6	0.000007		
guanylate binding protein 1, interferon-inducible, 67 kD	202269	GBP1	2.6	0.002	Yes	
Transporters / channels						
GLUT 3 (Solute carrier family 2, member 3; facilitated glucose transporter)	202499	SLC2A3	10.5	0.0000006		<i>Eur J Biochem 241:403-410 (1996)</i>
Solute carrier family 7, member 11 (cationic amino acid transporter)	207528	SLC7A11	5.6			
ATP-binding cassette, sub-family G (white). member 1	204567	ABCG1	5.5	0.00009		
Solute carrier family 12, member 2 (sodium, potassium, chloride transporters)	204404	SLC12A2	4.2	0.0000000017	Yes	
ATP-binding cassette, subfamily A (ABC1), member 1 (traffic ATPase, similar CFTR)	203505	ABCA1	3.6	0.0002		
Solute carrier family 38, member 1	218237	SLC38A1	2.7	0.000007		
Solute carrier family 7, member 5 (cationic amino acid transporter)	201195	SLC7A5	2.6	0.0001		

Others						
Clone IMAGE:4711494	221477	-	13.6	0.000043		
PMA-induced protein 1	204285	PMAIP1	7.8	0.00000018		
Zinc finger protein	212689	JMJD1A	6.9	0.00000048		Blood 105:659-669 (2005)
KIAA1053 protein (potential mediator of protein-protein interactions)	215495	SAMD4	6.7	0.000004		
Chromosome 8 open reading frame 4	218541	C8orf4	4.2	0.00003	Yes	
Hypothetical protein FLJ20059	221985	DRE1	4.3	0.0000015		
Nuclear receptor subfamily 3, group C, member 1 (glucocorticoid receptor)	216321	NR3C1	4.0	0.00019		
Syndecan 4 (amphiglycan, ryodocan) (intracellular communication)	202071	SDC4	3.8	0.00000089		
Thioredoxin interacting protein	201010	TXNIP	3.7	0.0015		Blood 105:659-669 (2005)
RNA (guanine-7-) methyltransferase (ribosomal protein S19, mRNA capping)	202684	RNMT	3.6	0.00068		
Proline-rich nuclear receptor coactivator 1	209034	PNRC1	3.4	0.00024		
Stanniocalcin 2 (extracellular hormone activity; cell cell signaling)	203439	STC2	3.3	0.000006		Blood 105:659-669 (2005)
Testis derived transcript (3 LIM domains)	202720	TES	3.2	0.0001		
Adrenomedullin (peptide with hypotensive effect)	202912	ADM	2.9	0.0000016		Blood 105:659-669 (2005)
Adenylate kinase 3 (mitochondrial; homeostasis of the adenine-/guanine nucleotide pool)	204348	AK3	2.9	0.0004		Blood 105:659-669 (2005)
Phosphoserine phosphatase-like	205048	PSPH	2.9	0.003		
Hypothetical protein FLJ10618 (mitochondrial transport)	201917	FLJ10618	2.9	0.0000003		
Muscleblind-like protein MBLL39	205018	MBNL2	2.8	0.005		
WW45 protein	218276	SAV1	2.7	0.00026		
Opioid growth factor receptor-like 1 (OGFRL1),	219582	OGFRL1	2.7	0.0005		
Formin-binding protein 1	212288	FNBP1	2.6	0.00007		
Transducin-like enhancer of split 3	206472	TLE3	2.6	0.00002		

(E(sp1)) homolog Drosophila)						
Slingshot 1 (actin cytoskeleton; reactivates ADF/cofilin)	221752		2.5	0.0003		
Hypothetical protein H41	213554	H41	2.5	0.0001		
Lysyl oxidase (extracellular enzyme; inhibition of crosslink of collagen and elastin)	215446	LOX	2.5	0.00001		Blood 105:659-669 (2005)
KIAA0876 protein	212492	JMJD2B	2.5	0.0002		
Neuron navigator 2	218330	NAV2	2.5	0.0002		
Fibronectin leucine rich transmembrane protein 2 (contacts to extracellular matrix)	204358	FLRT2	2.5	0.00004		

B. Genes switched-on by Ni²⁺	Affymetrix identifier	Gene symbol	Expression over back- ground upon exposure to Ni²⁺	Induction by TNFα*	HIF-1α-dependent regulation in ECs and other cells (<i>in italics</i>) as established in the literature
Chemokines / cytokines					
CXCL3 (Gro-gamma)	207850	CXCL3	++++	Yes	
CX3CL1 (Fractalkine)	823	CX3CL1	+	Yes	Blood 105:659-669 (2005)
CCL20	205476	CCL20	++++	Yes	
Colony-stimulating factor 2 (GM-CSF)	210229	CSF2	++++	Yes	
Colony-stimulating factor 3 (G-CSF)	207442	CSF3	++++		
CXCL5	215101	CXCL5	+++	Yes	
IL-1-alpha	210118	IL1A	+		
Lymphotoxin beta	207339	LTB	+	Yes	
Colony-stimulating factor 1 (M-CSF)	209716	CSF1	+	Yes	
Cell surface receptors					
IL-18 receptor 1	206618	IL18R1	++	Yes	
Integrin beta 8	205816	ITGB8	+		

Signaling / transcription					
CCAAT/enhancer binding protein (C/EBP), delta	203973	CEBPD	+++		
Receptor-interacting serine-threonine kinase 2	209545	RIPK2	+		
Nuclear factor of kappa light polypeptide gene enhancer in B-cells 2 (p49/p100)	209636	NFKB2	+	Yes	
MAPKKK (MEKK) 8	205027	MAP3K8	+		
v-rel reticuloendotheliosis viral oncogene homolog B, nuclear factor of kappa light polypeptide gene enhancer in B cells (avian)	205205	RELB	+	Yes	
PKC-alpha	215195	PRKCA	+		
Apoptosis / cell proliferation					
c-IAP-2 (Baculoviral IAP repeat containing 3)	210538	BIRC3	++	Yes	
BCL2-related protein A1	205681	BCL2A1	++	Yes	
TNF-alpha-induced protein 3 (A20)	202643	TNFAIP3	+		
Metabolism					
Kynureninase	217388	KYNU	++		
Cystathionase (cystathionine gamma-lyase)	206085	CTH	+		
Enolase 2 (gamma, neuronal)	201313	ENO2	+		
Transporters / channels					
Solute carrier family 7, member 2 (cationic amino acid transporter)	207626	SLC7A2	++	Yes	
Others					
HIV type I enhancer binding protein 2	212641	HIVEP2	++	Yes	Blood 105:659-669 (2005)

Melanoma differentiation associated protein 5	219209	IFIH1	++	Yes	
Neuregulin 1(protooncogene; similar to EGF-receptor)	206237	NRG1	+		
Hypothetical protein FLJ20059	221986	DRE1	++		
TNF-alpha-induced protein 6 (member of hyaluronan-binding proteins, CD44-homolog)	206026	TNFAIP6	+		
PDZ domain containing 2	209493	PDZK3	+		Blood 105:659-669 (2005)
Hypothetical protein MGC4504	219270	MGC4504	++		

* Data obtained from parallel experiments in which HUVEC were exposed for 5 h to 2 ng/ml TNF α (see Blood 103:3365-3373 (2004)).

** HIF-1 α -dependent regulation established in the literature in other than ECs.

TABLE S2

Ni²⁺-mediated down-regulation of gene expression in primary human endothelial cells (HUVEC)

A. Genes down-regulated by Ni²⁺	Affymetrix identifier	Gene symbol	Fold-change	p-value	Down-regulation by TNFα*	HIF-1α-dependent regulation in ECs and other cells (<i>in italics</i>) as established in the literature
Chemokines / cytokines						
Thymopoetin	203432	TMPO	-3.3	0.00003		
Small inducible cytokine subfamily E, member 1 (endothelial monocytes-activating)	202541	SCYE1	-2.9	0.00002		
Cell surface receptors						
Coxsackie virus and adenovirus receptor	203917	CXADR	-3.5	0.000006	Yes	
G protein-coupled receptor 37 (endothelin receptor type B-like)	209630	FBXW2	-3.0	0.000008		
Six transmembrane epithelial antigen of the prostate	205542	STEAP	-3.4	0.000004		
Inflammation / immune response						
Hsp 70kDa protein 8	208687	HSPA8	-3.4	0.0000002		
Hsp 70kD protein 1B	202581	HSPA1B	-3.0	0.0001		
DnaJ (Hsp40) homolog, subfamily B, member 4	203810	DNAJB4	-3.0	0.00005	Yes	
Hsp 70kDa protein 1A	200799	HSPA1A	-4.7	0.0000002		
Signaling / transcription / translation						
Dicer1. Dcr-1 homolog (Drososphila) (production of active sRNA, repression of	212888	DICER1	-6.3	0,00002		

gene expression)						
Splicing factor, arginine/serine-rich 5	203380	SFRS5	-5.8	0.00001		<i>J Pathol 2006:291-304 (2005)</i>
TAR DNA binding protein (transcription regulator of HIF)	200020	TARDBP	-4.8	0.000001		
KIAA1196 protein (transcription factor)	55872	KIAA1196	-4.6	0.00002		
RAB33B (member RAS oncogene family; intracellular protein transport and small GTPase mediated signal transduction; localized in Golgi apparatus)	221014	RAB33B	-4.6	0.0002		
RNA binding motif protein 12	212168	RBM12	-3.7	0.000007		
A kinase (PRKA) anchor protein 11 (directs PKA activity onto its substrate)	203156	AKAP11	-3.4	0.00002		
Myeloid/lymphoid or mixed-lineage leukaemia translocated to, 2 (transcription factor)	201924	MLLT2	-3.2	0.0007		
Dachshund homolog (Drosophila) (transcription factor)	205471	DACH1	-3.2	0.00007		
SECIS binding protein 2 (translation)	218265	SECISBP 2	-3.2	0.001		
H2A histone family, member X	205436	H2AFX	-3.1	0.000002		
SRY (sex determining region Y)-box 18	219568	SOX18	-3.1	0.0008	Yes	
c-mer protooncogene tyrosine kinase (receptor similar trosine kinase)	206028	MERTK	-3.1	0.000002		
RAB5B (member RAS oncogene family)	201276	RAB5B	-3.0	0.000002		
Proteasome (prosome, macropain) 26S subunit, non-ATPase	202353	PSMD12	-3.0	0.00003		
Activated RNA polymerase II transcription cofactor 4	221727	PC4	-3.0	0.00002		
Chromobox homolog 6 (chromatin assembly/disassembly; regulation of transcription)	202047	CBX6	-3.0	0.0001		
Purin-rich element binding protein A (RNA polymerase II transcription factor activity)	204020	PURA	-2.9	0.000006		

RNA binding motif protein 9 (RNA metabolism; regulation of cell proliferation; negative regulation of transcription)	216215	RBM9	-2.9	0.000002		
Translation initiation factor 1A	201018	EIF1AX	-2.9	0.0005		
TAF11 RNA polymerase II (TATA box binding protein-associated factor)	209358	TAF11	-2.9	0.0001		
Ste20-related serine/threonine kinase	206874	-	-2.8	0.0000003		
SAR1 protein (small GTPase mediated signal transduction; intracellular protein transport)	201542	SARA1	-2.8	0.00002		
HCF-binding transcription factor Zhangfei	202979	ZF	-2.8	0.0002		
Thyroid hormone receptor-associated protein (regulation of transcription; nuclear hormone receptor)	201987	THRAP1	-2.6	0.0002		
Zinc finger protein 106 (transcription factor)	217781	SH3BP3	-2.6	0.00002		
CREBBP/EP300 inhibitory protein 1	211698	CRI1	-2.6	0.01		
Uracil-DNA glycosylase (DNA repair; Ig-Switch recombination)	202330	UNG	-2.6	0.0002		
Sin3-associated polypeptide, 18kD (transcriptional repressor)	212993	-	-2.5	0.0000009		
KDEL endoplasmic reticulum protein retention receptor (intracellular protein transport)	208718	DDX17	-2.5	0.0000007		
Apoptosis / cell proliferation						
Fem-1 homolog b (C. elegans) (death receptor binding; induction of apoptosis)	212367	FEM1B	-5.3	0.000009		
TIA1 cytotoxic granule-associated RNA binding protein (induction of apoptosis in CTL targets)	201448	TIA1	-4.7	0.0000005		
Myeloid cell leukaemia sequence 1 (BCL2-related)	200797	MCL1	-3.4	0.000005		
Cyclin E2	205034	CCNE2	-3.1	0.00004		Blood 105:659-669 (2005)

MCM4 minichromosome maintenance deficient 4 (cell cycle control)	222036	MCM4	-3.0	0.001		Blood 105:659-669 (2005)
CDC23 (cell division cycle 23) (anaphase promoting complex)	202892	CDC23	-2.8	0.00000009		
Cyclin D1 (PRAD1: parathyroid adenomatosis 1)	208712	CCND1	-2.6	0.00003		
Replication factor C (activator 1) 3 (38kD)	204127	RFC3	-2.5	0.006		Blood 105:659-669 (2005)
S-phase kinase-associated protein 2 (p45)	210567	SKP2	-2.5	0.007		Blood 105:659-669 (2005)
Cyclin D2	200953	CCND2	-2.5	0.0005		
MCM2 minichromosome maintenance deficient 2 (mitotin, cell cycle control)	202107	MCM2	-3.0	0.001		Blood 105:659-669 (2005)
Metabolism						
Methionine adenosyltransferase II, alpha	200768	MAT2A	-8.0	0.0000003		
Lysosomal apyrase-like 1 (lysosomal; nucleotide and nucleic acid metabolism)	204076	ENTPD4	-6.3	0.000006		
24-dehydrocholesterol reductase	200862	DHCR24	-5.0	0.00001		
Sterol-C4-methyl oxidase-like (sterol biosynthesis; anchored in plasma membrane)	209146	SC4MOL	-4.7	0.000004		
LDL-receptor	202068	LDLR	-4.5	0.000001		
HMG-CoA-Reductase	202540	HMGCR	-4.3	0.00002		
Mitochondrial ribosomal protein S6 (protein biosynthesis)	212944	MRPS6	-4.0	0.000002		
Panthothenate kinase 3 (coenzyme A biosynthesis)	221751	PANK3	-3.6	0.000007		
UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalactosaminyltransferase	219013	GALNT11	-3.6	0.0001		
Degenerative spermatocyte homolog, lipid desaturase (Drosophila)	207431	DEGS	-3.6	0.00001		
Fatty acid synthase	212218	FASN	-3.1	0.00005		
Squalene epoxidase	209218	SQLE	-2.9	0.00002		
Fucose-1-phosphate guanylyltransferase	205140	FPGT	-2.8	0.00007		

Sterol-C5-desaturase-like	211423	SC5DL	-2.6	0.002		
Phosphoribosylformylglycinamide synthase (FGAR amidotransferase)	213302	PFAS	-2.6	0.004		
Uridine monophosphate synthetase	202706	UMPS	-2.6	0.0002		Blood 105:659-669 (2005)
Transporters / channels						
ATPase, Ca ²⁺ -transporting	212361	ATP2A2	-3.1	0.000003		
Solute carrier family 26, member 2 (sulphate transporter)	205097	SLC26A2	-2.9	0.0001		
Solute carrier family 4, member 7 (sodium bicarbonate cotransporter)	209884	SLC4A7	-2.7	0.0003		
Solute carrier family 3, member 1 (cystine, dibasic and neutral amino acids)	212217	KIAA0436	-2.7	0.000002		
Cell structure						
Pinin (desmosome associated protein)	212037	PNN	-9.3	0.00000005		
Wiskott-Aldrich syndrome protein interacting protein	202664	WASPIP	-3.0	0.002		
Others						
Cisplatin resistance-associated overexpressed protein	220044	CROP	-4.3	0.000002		
Retinoblastoma associated protein 140	209285	RAP140	-4.1	0.00001		
TSPY-like 4 (nucleosome assembly)	212928	TSPYL4	-3.8	0.000005		
Nucleoporin Nup 43 (intracellular protein transport)	219007	NUP43	-3.8	0.000006		
Lin-7 homolog (C. elegans)	221568	LIN7C	-3.4	0.0007		
Hypothetical protein MGC5139	202365	MGC5139	-3.3	0.0001		
DKFZP564F0522 protein	212333	DKFZP564F0522	-3.3	0.00003		
SR rich protein	212179	C6orf111	-3.3	0.0001		
PHD finger protein 9 (ligase activity, DNA repair)	218397	FANCL	-3.2	0.0001		
Acid-inducible phosphoprotein	203804	CROP	-3.2	0.00007		

Dynactin 4	209232	MGC3248	-3.2	0.0008		
Hypothetical protein FLJ13576	218962	FLJ13576	-3.2	0.0002		
cDNA FLJ20463 fis, clone KAT06143	222196	LOC2864 34	-3.0	0.004		
Proteasome activator 200 kDa	212222	PSME4	-3.0	0.00002		
KIAA0907	202220	KIAA0907	-3.0	0.00001		
Chromosome 1 open reading frame 22	220926	C1orf22	-2.9	0.001		
ESTs	222273	-	-2.9	0.00004		
MRS2-like, magnesium homeostasis factor	218536	MRS2L	-2.9	0.00002		
TRAM-like protein (translocation associated membrane protein 2)	202369	TRAM2	-2.9	0.00001		
RAN binding protein 6	213019	RANBP6	-2.9	0.00004		
Disabled homolog 2, mitogen-responsive phosphoprotein (Drosophila)	201280	DAB2	-2.9	0.00003		
Hypothetical protein FLJ21820	219008	FLJ21820	-2.9	0.0005		
Sjögren-syndrome antigen A2 (SSA2)	213027	SSA2	-2.8	0.000001		
Hypothetical protein FLJ14146	218546	FLJ14146	-2.7	0.003		
BENE protein	209373	BENE	-2.7	0.0004		
TPA regulated locus	218095	TPARL	-2.7	0.00006		
MEP50 protein	201421	MEP50	-2.7	0.000006		
c-Mpl binding protein	212714	LOC1132 51	-2.6	0.00002		
Hypothetical protein DKFZp566A1524	209683	-	-2.5	0.0009		
Fracture callus 1 homolog (import and insertion of hydrophobic proteins into inner mitochondrial membrane)	217981	FXC1	-2.5	0.00003		
Ret finger protein	210541	RFP	-2.5	0.002		

B. Genes switched-off by Ni²⁺	Affymetrix identifier	Gene symbol	Expression over background prior to exposure to Ni²⁺	Gene switched-off by TNFα*	HIF-1α-dependent regulation in ECs and other cells (<i>in italics</i>) as established in the literature
Chemokines/cytokines					
Interleukin 14	212300	DKFZp451J0118	+		
Signaling / transcription / translation					
Gern (nuclear organelle) associated protein 4 (mRNA splicing)	205527	GEMIN4	+++		
RNA binding motif protein 12	212170	RBM12	++		
U2-associated SR140 protein (RNA processing)	212061	SR140	+		
Zinc finger protein 228 (transcription factor)	222237	ZNF228	+		
Inflammation / immune response					
Heat shock 70kD protein 1A	200800	HSPA1A	+		
Apoptosis/cell proliferation					
Modulator of apoptosis 1	212508	MOAP1	+		
S-phase kinase-associated protein 2 (p45) (regulation of cell cycle)	203625	SKP2	+		
Cell structure					
Microtubule-associated protein, RP/EB family, member 2	213489	-	+		
Others					
Hypothetical protein FLJ21945	219120	FLJ21945	++		

cDNA FLJ12521 fis, clone NT2RM2001840	64488	-	+		
Hypothetical protein p5326	221534	Bles03	+		
Zinc-finger protein DZIP1	204557	DZIP1	+		
cDNA DKFZp586K1318	213701	DKFZp434N2030	+		
Casein kinase 1, delta	208774	CSNK1D	+		
Protein phosphatase 1F	203063	PPM1F	+		

* Data obtained from parallel experiments in which HUVEC were exposed for 5 h to 2 ng/ml TNF α (see Blood 103:3365-3373 (2004)).