Supplementary Figure S1. Quantitative histomorphometric analyses of the TRAIL, TRAIL-R1 and cFLIP expressions in distinct hair follicle compartments after doxorubicin treatment.

HFs were collected 24h after treatment with 1 μM doxorubicin or control and processed for immunofluorescent detection of TRAIL, TRAIL-R1 and cFLIP.

A – Images demonstrating expression of TRAIL, TRAIL-R1 and cFLIP in the control and DXR-treated HFs. Areas selected for quantitative histomorphometric analyses in each HF compartment are indicated by dotted line (DP – dermal papilla, Mx – matrix, PC-precortex). Scale bar: 100 μm.

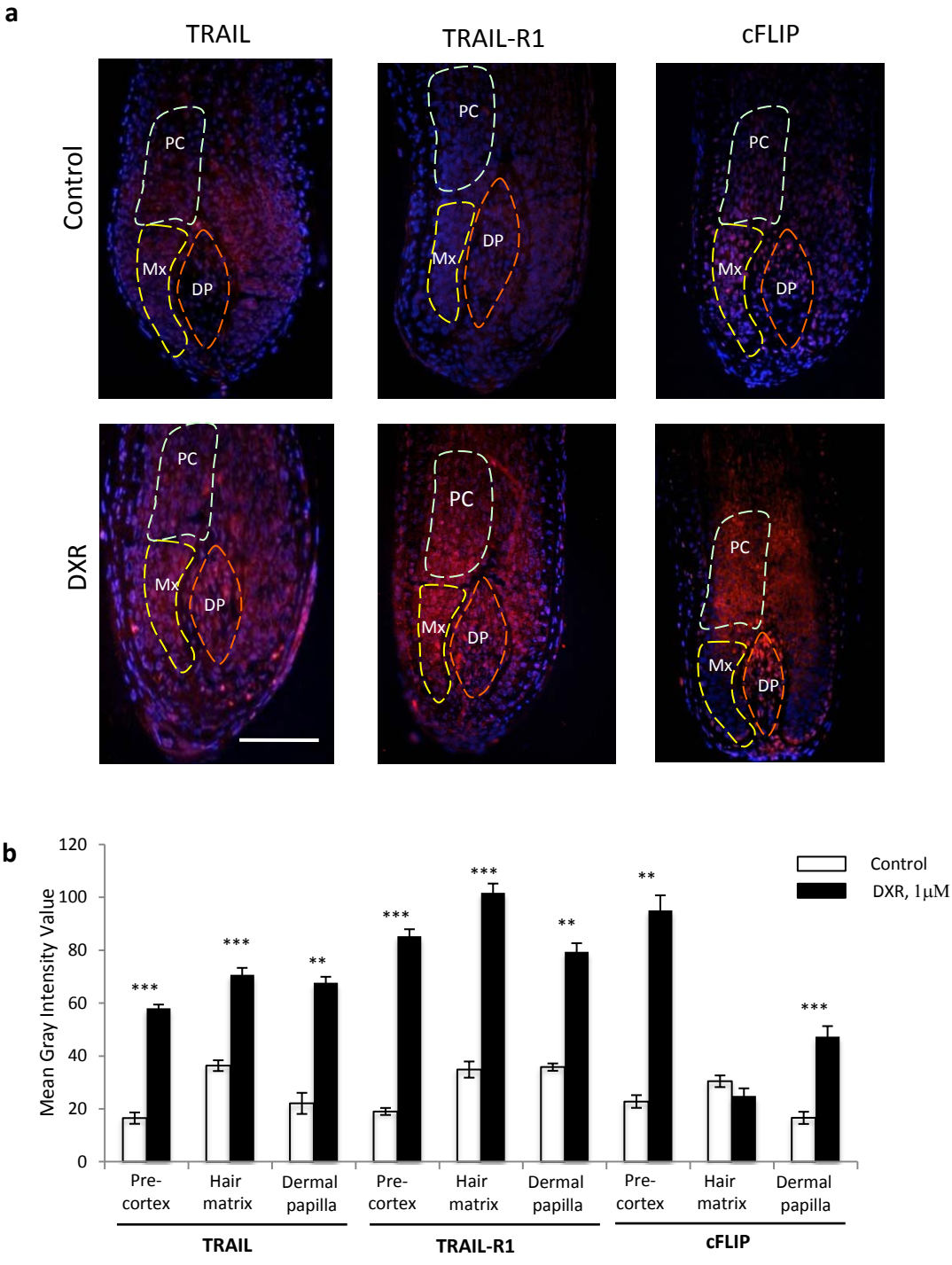
B – Quantitative histomorphometric data show significant increase of TRAIL, TRAIL-R1 and cFLIP expressions in the precortex and dermal papilla. However, matrix cells show only increase of TRAIL and TRAIL-R1 expression, while cFLIP expression remains at low levels and does not show any changes between the control and DXR-treated HFs (mean ± SD, ** - $p<0.01$, *** $p<0.001$; Student's t-test).

Supplementary Figure S2. Dynamics of cFLIP expression in the hair follicles after doxorubicin treatment.

HFs were collected 24h, 48h and 72h after treatment with 1 μM doxorubicin and processed for immunohistochemistry or qRT-PCR.

A: Marked increase of cFLIP protein expression in differentiating hair shaft keratinocytes (thin arrows) and dermal papilla (asterisk) 24h after doxorubicin treatment. Lack of cFLIP expression in hair matrix keratinocytes at the bottom of hair bulb (thick arrows). Scale bar: 100 μm.

B: qRT-PCR shows marked increase of cFLIP mRNA expression in the HFs 24h after doxorubicin treatment followed by its decrease on 48h and 72 h after treatment compared to the controls.



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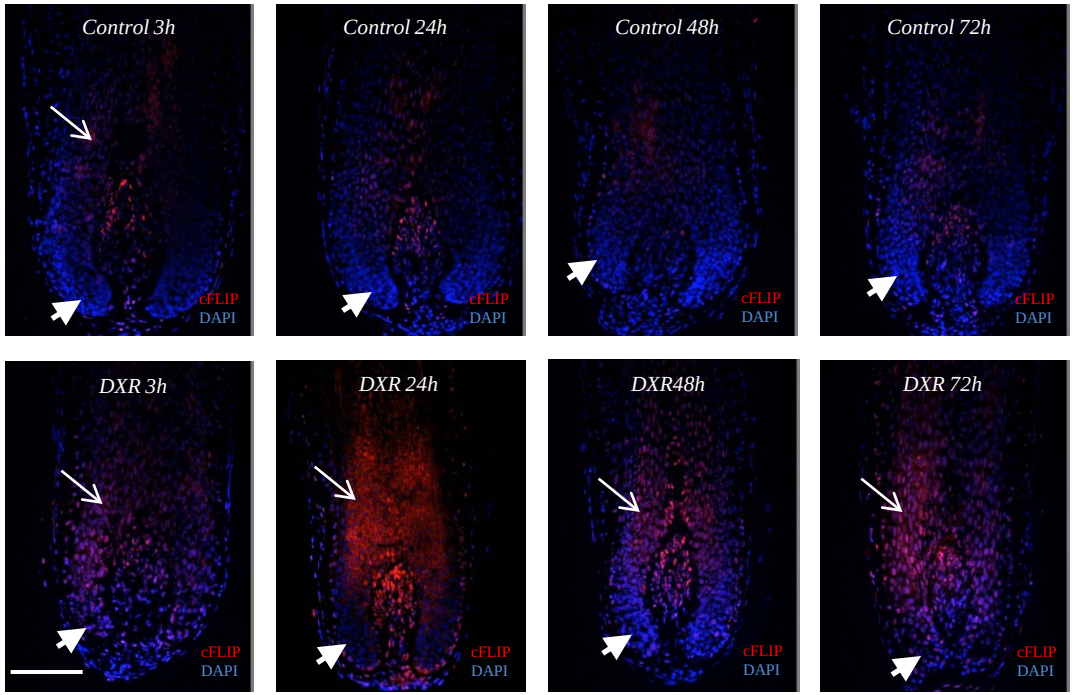
a



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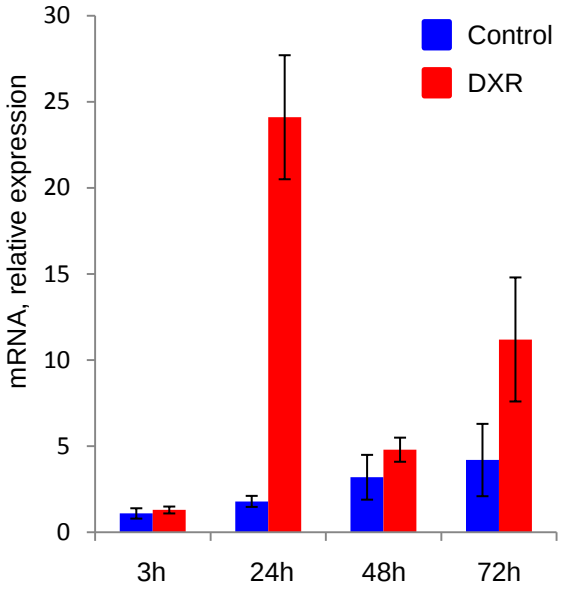

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Supplementary Tables

Supplementary Table S1. Genes that show 2-fold upregulation in Doxorubicin treated hair follicles versus control.

Gene/Function	Gene Symbol	Accession Number	Fold Change
Adhhesion/Extracellular Matrix			
RAN binding protein 9	RANBP9	AI476722	104.29
Protocadherin 20	PCDH20	BC038756	13.69
Limbic system-associated membrane protein	LSAMP	R49462	9.45
claudin 18	CLDN18	BE551219	8.45
CD28 molecule	CD28	NM_006139	7.45
protocadherin beta 15	PCDHB15	AV722990	3.47
neogenin homolog 1 (chicken)	NEO1	AL355708	3.19
integrin-linked kinase	ILK	NM_004517	2.99
pleckstrin homology, Sec7 and coiled-coil domains 1	PSCD1	NM_004762	2.64
protocadherin beta 2	PCDHB2	NM_018936	2.59
CD209 molecule	CD209	AY042224	2.54
Fibronectin 1	FN1	AI333596	2.49
craniofacial development protein 1	CFDP1	NM_006324	2.33
Cell cycle			
cyclin-dependent kinase inhibitor 1C (p57, Kip2)	CDKN1C	R78668	4.7
Proline rich 6	PRR6	N30008	3.71
cyclin J	CCNJ	NM_019084	3.01
cyclin-dependent kinase inhibitor 1A (p21, Cip1)	CDKN1A	NM_000389	2.87
Sestrin 1	SESN1	AA705429	2.47
Apoptosis			
Pro-apoptotic genes			
RAD50 interactor 1	RINT1	BC007100	33.63
HUS1 checkpoint homolog (S. pombe)	HUS1	NM_004507	7
Fas (TNF receptor superfamily, member 6)	FAS	NM_000043	4.35
tumor necrosis factor receptor superfamily, member 10b	TNFRSF10B	AF016266	4
RAP1 interacting factor homolog (yeast)	RIF1	AI003806	3.29
tumor protein p53 inducible nuclear protein 1	TP53INP1	AW341649	2.55
tumor necrosis factor receptor superfamily, member 10a	TNFRSF10A	W65310	2.45
p53-regulated apoptosis-inducing protein 1	P53AIP1	NM_022112	2.31
tumor necrosis factor (ligand) superfamily, member 15	TNFSF15	NM_005118	2.1
Anti-apoptotic genes			
BCL2-related protein A1	BCL2A1	NM_004049	21.94
B-cell CLL/lymphoma 2	BCL2	AU146963	3.85
CASP8 and FADD-like apoptosis regulator	CFLAR	AF015452	3.05
tumor necrosis factor receptor superfamily, member 10d	TNFRSF10D	AI738556	2.61
BRCA1 interacting protein C-terminal helicase 1	BRIP1	AF360549	2.42
APAF1 interacting protein	APIP	AF131812	2.37
B-cell CLL/lymphoma 10	BCL10	AA994334	2.36
B-cell CLL/lymphoma 6, member B (zinc finger protein)	BCL6B	AI827455	2.27
BRCA1/BRCA2-containing complex, subunit 3	BRCC3	S72931	2.19
TP53 regulated inhibitor of apoptosis 1	TRIAP1	NM_016399	2.15
Chromatin Remodeling			
SATB family member 2	SATB2	AK025127	12.94
Wolf-Hirschhorn syndrome candidate 1-like 1	WHSC1L1	NM_023034	9.22
Sex comb on midleg homolog 1 (Drosophila)	SCMH1	W93230	4.64
Arginine-glutamic acid dipeptide (RE) repeats	RERE	AU148274	2.88

SET and MYND domain containing 3	SMYD3	AA434097	2.77
chromodomain helicase DNA binding protein 9	CHD9	NM_025134	2.61
methyltransferase like 7A	METTL7A	AF113007	2.51
Cytoskeleton/Cell Differentiation			
keratin associated protein 9-9	KRTAP9-9	NM_030975	34.87
keratin associated protein 1-3	KRTAP1-3	NM_030966	32.11
keratin associated protein 3-2	KRTAP3-2	AJ406932	27.39
keratin associated protein 4-7	KRTAP4-7	AJ406939	11.08
melanoma antigen family E, 1	MAGEE1	AI912696	8.71
keratin associated protein 2-2	KRTAP2-2	AJ406929	8.65
keratin associated protein 9-2	KRTAP9-2	AJ406946	8.53
ankyrin repeat domain 44	ANKRD44	AL133087	4.6
Myosin VC	MYO5C	AA004803	7.61
keratin associated protein 2-4	KRTAP2-4	NM_030977	6.67
keratin associated protein 4-4	KRTAP4-4	AJ296168	5.91
keratin associated protein 2-1	KRTAP2-1	BC012486	5.29
keratin associated protein 1-1	KRTAP1-1	NM_030967	5.12
keratin associated protein 3-3	KRTAP3-3	AJ406933	4.14
keratin associated protein 1-5	KRTAP1-5	AJ406928	4.02
keratin associated protein 4-15	KRTAP4-15	AJ406945	3.67
prothymosin, alpha (gene sequence 28)	PTMA	BF686442	3.51
keratin associated protein 4-3	KRTAP4-3	AJ406935	3.27
Myosin, light polypeptide kinase	MYLK	AL832211	3.17
keratin associated protein 4-9	KRTAP4-9	AJ406941	3.13
dynein, axonemal, heavy polypeptide 5	DNAH5	AW272255	3.04
transmembrane protein 19	TMEM19	AW663887	2.93
tau tubulin kinase 2	TTBK2	AW294686	2.63
keratin associated protein 4-2	KRTAP4-2	AJ406934	2.61
septin 8	SPT8	AI912094	2.75
cytotoxic T-lymphocyte-associated protein 4	CTLA4	AI733018	2.3
collagen, type IV, alpha 3 (Goodpasture antigen)	COL4A3	U02520	2.24
dynein heavy chain domain 2	DNHD2	AI005163	2.23
Metabolism			
heparan sulfate 2-O-sulfotransferase 1	HS2ST1	AI806674	16.65
pleckstrin homology domain containing, family A member 5	PLEKHA5	AK026344	15.43
solute carrier family 4, sodium bicarbonate cotransporter	SLC4A4	AF011390	12.5
fatty acid binding protein 7, brain	FABP7	NM_001446	9.81
solute carrier family 17 (sodium phosphate), member 4	SLC17A4	NM_005495	9.43
DDHD domain containing 1	DDHD1	AW183689	8.28
Iduronate 2-sulfatase (Hunter syndrome)	IDS	AI819115	6.99
SAM domain and HD domain 1	SAMHD1	AF147427	6.28
aldehyde dehydrogenase 1 family, member A3	ALDH1A3	NM_000693	6.11
branched chain aminotransferase 1, cytosolic	BCAT1	AL390172	5.47
UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 1	B3GNT1	AI971627	5.04
ST6	ST6GALNAC5	AU145390	4.92
chromosome 12 open reading frame 5	C12orf5	NM_020375	4.42
3-hydroxymethyl-3-methylglutaryl-Coenzyme A lyase-like 1	HMGCLL1	AL137630	4.07
leucine rich repeat containing 41	LRRC41	BC042988	3.61
PDZ and LIM domain 4	PDLIM4	BE043700	3.57
fibronectin type III domain containing 6	FNDC6	AL578102	3.48
choline phosphotransferase 1	CHPT1	BF940025	3.43
ATP-binding cassette, sub-family A (ABC1), member 10	ABCA10	AF132201	3.35
Nudix (nucleoside diphosphate linked moiety X)-type motif 9	NUDT9	BE671532	3.27
pentraxin-related gene, rapidly induced by IL-1 beta	PTX3	NM_002852	3.26
elastase 2, neutrophil	ELA2	NM_001972	3.13

schlafen-like 1	SLFNL1	NM_144990	3.09
WD repeat domain 63	WDR63	AI860874	3.05
sorting nexing 24	SNX24	AW452218	3.02
Vacuolar protein sorting 13 homolog D (S. cerevisiae)	VPS13D	BF724733	3
solute carrier family 12 (sodium/potassium/chloride transporters)	SLC12A1	BC040138	2.89
lysosomal-associated membrane protein 3	LAMP3	NM_014398	2.86
ATPase, Na+/K+ transporting, beta 1 polypeptide	ATP1B1	AL049331	2.81
Acyl-CoA synthetase long-chain family member 4	ACSL4	AF090916	2.81
lactase	LCT	NM_002299	2.72
SEC31-like 1 (S. cerevisiae)	SEC31L1	AF086242	2.7
D-dopachrome tautomerase	DDT	NM_001355	2.67
Target of myb1-like 1 (chicken)	TOM1L1	AA913079	2.66
glucosidase I	GCS1	BC002804	2.66
CUG triplet repeat, RNA binding protein 2	CUGBP2	BE157991	2.65
Mitogen-activated protein kinase 9	MAPK9	AI808345	2.64
GM2 ganglioside activator	GM2A	AL513583	2.63
dedicator of cytokinesis 11	DOCK11	AW968823	2.58
FCH and double SH3 domains 2	FCHSD2	AI535736	2.58
dihydropyrimidinase-like 4	DPYSL4	NM_006426	2.49
RAN binding protein 3	RANBP3	NM_003624	2.45
synaptotagmin VII	SYT7	AA633076	2.43
Abhydrolase domain containing 3	ABHD3	BF477544	2.42
heat shock 22kDa protein 8	HSPB8	BF109740	2.41
serine/threonine kinase 32A	STK32A	NM_145001	2.41
hydroxysteroid dehydrogenase like 2	HSDL2	BM014995	2.4
Shwachman-Bodian-Diamond syndrome	SBDS /// SBDSP	BC010183	2.4
UDP-Gal:betaGlcNAc beta 1,4- galactosyltransferase	B4GALT6	AV760769	2.34
Deoxythymidylate kinase (thymidylate kinase)	DTYMK	AU121224	2.29
Sorting nexin 12	SNX12	AI674915	2.31
Phospholipase C, epsilon 1	PLCE1	AK098548	2.22
PCTAIRE protein kinase 2	PCTK2	AA436887	2.22
Leucine rich repeat containing 8 family, member D	LRRC8D	AK025238	2.21
cytochrome P450, family 24, subfamily A, polypeptide 1	CYP24A1	NM_000782	2.2
Proteolysis			
protease, serine, 7 (enterokinase)	PRSS7	NM_002772	6.68
Itchy homolog E3 ubiquitin protein ligase (mouse)	ITCH	AI968264	4.56
zinc and ring finger 1	ZNRF1	AI144394	4.46
Ubiquitin specific peptidase 49	USP49	AU144129	3.61
DnaJ (Hsp40) homolog, subfamily B, member 2	DNAJB2	NM_006736	2.95
Ring finger protein 187	RNF187	BC015435	2.86
calpain 6	CAPN6	NM_014289	2.56
Carboxypeptidase M	CPM	AI422414	2.44
RNA Processing			
Threonyl-tRNA synthetase	TARS	AA701890	3.03
cleavage and polyadenylation specific factor 2, 100kDa	CPSF2	AA583986	2.56
Treacher Collins-Franceschetti syndrome 1	TCOF1	AW167713	2.48
Signaling			
sodium channel, voltage-gated, type XI, alpha	SCN11A	AF188679	40.73
DEP domain containing 2	DEPDC2	BC036055	32.15
prolactin releasing hormone receptor	PRLHR	AL563031	18.31
DEP domain containing 4	DEPDC4	BC039480	16.34
tuberous sclerosis 2	TSC2	AC005600	14.19
NFAT activating protein with ITAM motif 1	NFAM1	AI492017	10.97
R7 binding protein	R7BP	H05023	7.07

T cell receptor alpha locus	TRA@	AE000659	5.69
transient receptor potential cation channel, subfamily M, member 3	TRPM3	AL136545	5.34
stathmin-like 3	STMN3	NM_015894	5.1
ras homolog gene family, member F (in filopodia)	RHOF	BC018208	5.06
adrenergic, beta, receptor kinase 1	ADRBK1	M80776	5.04
Src-like-adaptor /// Src-like-adaptor	SLA	NM_006748	4.92
receptor transporter protein 1	RTP1	NM_153708	4.64
Glutamate receptor, metabotropic 5	GRM5	D60132	4.16
adrenergic, alpha-1D-, receptor	ADRA1D	M76446	4.02
FIP1 like 1 (S. cerevisiae)	FIP1L1	BC017724	3.87
CUG triplet repeat, RNA binding protein 2	CUGBP2	AI125337	3.83
progestin and adipoQ receptor family member IX	PAQR9	AK093381	3.49
Phosphodiesterase 4D, cAMP-specific	PDE4D	AI452799	3.49
SH3 and cysteine rich domain 3	STAC3	AW663959	3.27
Rho guanine nucleotide exchange factor (GEF) 7	ARHGEF7	AI040887	3.19
Septin 6	38966	T91323	3.16
A kinase (PRKA) anchor protein 13	AKAP13	AL133427	3.14
elastase 2, neutrophil	ELA2	NM_001972	3.13
Mitogen-activated protein kinase kinase kinase 7	MAP3K7IP2	AA769450	3.11
pygopus homolog 1 (Drosophila)	PYGO1	AL049925	3.1
Triple functional domain (PTPRF interacting)	TRIO	AW449903	2.97
low density lipoprotein receptor-related protein 6	LRP6	AF074264	2.92
GTP binding protein 2	GTPBP2	AI890529	2.9
olfactory receptor, family 2, subfamily C, member 1	OR2C1	NM_012368	2.89
Transforming growth factor, beta receptor I	TGFBR1	AV700621	2.87
Protein tyrosine phosphatase type IVA, member 1	PTP4A1	AA700206	2.8
UL16 binding protein 1	ULBP1	NM_025218	2.8
G protein-coupled receptor, family C, group 5, member C	GPRC5C	AK000249	2.7
proprotein convertase subtilisin/kexin type 2	PCSK2	AL031664	2.68
Leucine-rich repeat-containing G protein-coupled receptor 5	LGR5	AI962439	2.67
interleukin 1 receptor accessory protein	IL1RAP	NM_002182	2.54
low density lipoprotein-related protein 12	LRP12	NM_024937	2.53
Quaking homolog, KH domain RNA binding (mouse)	QKI	BC029474	2.39
B-cell linker	BLNK	AA931562	2.39
mitogen-activated protein kinase kinase 7	MAP2K7	AI090153	2.35
interferon (alpha, beta and omega) receptor 1	IFNAR1	AA811138	2.34
SNF1-like kinase 2	SNF1LK2	AL831884	2.32
Lymphocyte-specific protein 1	LSP1	AA630955	2.32
RAR-related orphan receptor A	RORA	BC040965	2.32
activin A receptor, type IC	ACVR1C	NM_145259	2.31
urocortin 3 (stresscopin)	UCN3	NM_053049	2.17
insulin-like growth factor 1 receptor	IGF1R	NM_015883	2.17
WNT inhibitory factor 1	WIF1	NM_007191	2.16
Transcription			
actin-binding Rho activating protein	ABRA	AL832152	19.51
maelstrom homolog (Drosophila)	MAEL	AA446073	10.48
zinc finger protein 227	ZNF227	AC074331	10.32
POU domain, class 2, transcription factor 1	POU2F1	BC041822	9.71
Sine oculis homeobox homolog 1 (Drosophila)	SIX1	N79004	6.49
Zinc finger protein 331	ZNF331	AK022474	5.66
PR domain containing 4	PRDM4	AI806319	5.26
four and a half LIM domains 1	FHL1	AF063002	5.12
B double prime 1	BDP1	AJ238520	5.06
zinc finger protein 441	ZNF441	NM_152355	4.28
zinc finger, MYND-type containing 10	ZMYND10	AC002481	3.68
TAF15 RNA polymerase II, TATA box binding protein	TAF15	AW296067	3.23

transducin-like enhancer of split 4 (E(sp1) homolog, Drosophila)	TLE4	AA705845	3.19
ets variant gene 6 (TEL oncogene)	ETV6	NM_001987	3.16
excision repair cross-complementing rodent repair deficiency	ERCC8	BC009793	3.04
E2F transcription factor 3	E2F3	AI640363	3.03
Transcription factor 12	TCF12	AL442094	3.02
zinc finger protein 114	ZNF114	NM_153608	2.99
Regulatory factor X domain containing 2	RFXDC2	BC008462	2.93
hairy and enhancer of split 6 (Drosophila)	HES6	AW249678	2.9
signal transducer and activator of transcription 5B	STAT5B	NM_012448	2.86
Regulatory factor X, 3 (influences HLA class II expression)	RFX3	AL157466	2.81
protein phosphatase 5, catalytic subunit	PPP5C	BC000750	2.8
Polymerase (RNA) II (DNA directed) polypeptide E, 25kDa	POLR2E	AI439416	2.68
Trichorhinophalangeal syndrome I	TRPS1	T56980	2.65
Transcription factor 7-like 2 (T-cell specific, HMG-box)	TCF7L2	AL832684	2.54
transducin-like enhancer of split 4 (E(sp1) homolog, Drosophila)	TLE4	BF217301	2.5
T-box 2	TBX2	NM_005994	2.5
MYST histone acetyltransferase (monocytic leukemia) 3	MYST3	AK027361	2.35
LIM domains containing 1	LIMD1	M80651	2.34
Thyroid hormone receptor associated protein 2	THRAP2	AK021554	2.33
ring finger protein 123	RNF123	AL136729	2.3
zinc finger, CCHC domain containing 12	ZCCHC12	AV725825	2.29
ring finger protein 165	RNF165	BF529886	2.27
TGFB-induced factor (TALE family homeobox)	TGIF	AL832409	2.24
Steroid receptor RNA activator 1	SRA1	AU148255	2.23
engrailed homolog 1	EN1	NM_001426	2.21
small nuclear RNA activating complex, polypeptide 3, 50kDa	SNAPC3	AI066599	2.21
Rtf1, Paf1/RNA polymerase II complex component	RTF1	AI192081	2.14
Sp3 transcription factor	SP3	AW470841	2.13
Others			
KIAA1217	KIAA1217	AA777639	3.31
RNA binding motif, single stranded interacting protein 1	RBMS1	BF439728	2.8

Supplementary Table S2. Genes that show 2-fold downregulation in Doxorubicin treated hair follicles versus control.

Gene/Function	Gene	Accession Number	Fold Change
Adhhesion/Extracellular Matrix			
Down syndrome cell adhesion molecule	DSCAM	BE503065	17.26
transmembrane protein 67	TMEM67	NM_153704	11.8
Tetraspanin 5	TSPAN5	AL832038	8.67
C-type lectin domain family 4, member E	CLEC4E	NM_014358	8.62
hyaluronan and proteoglycan link protein 1	HAPLN1	U43328	7.39
CD80 molecule	CD80	BC042665	6.71
discs, large homolog 1 (Drosophila)	DLG1	NM_004087	3.84
Ectonucleoside triphosphate diphosphohydrolase 1	ENTPD1	BF508564	3.47
CD93 molecule	CD93	NM_012072	3.18
laminin, alpha 2 (merosin)	LAMA2	AK026829	3.17
cadherin 11, type 2, OB-cadherin (osteoblast)	CDH11	D21254	3.12
selectin E (endothelial adhesion molecule 1)	SELE	NM_000450	3.07
Neurexin 3	NRXN3	AL134451	2.94
mucin 13, cell surface associated	MUC13	NM_017648	2.73
EGF-like repeats and discoidin I-like domains 3	EDIL3	AA053711	2.73
claudin 8	CLDN8	AL049977	2.61
thrombospondin 1	THBS1	NM_003246	2.61
nidogen 1	NID1	BF940043	2.55
LIM domain containing preferred translocation partner in lipoma	LPP	T86427	2.49
leupaxin	LPXN	AA250935	2.45
neural cell adhesion molecule 2	NCAM2	NM_004540	2.38
FAT tumor suppressor homolog 4 (Drosophila)	FAT4	NM_024582	2.38
gap junction protein, alpha 4, 37kDa (connexin 37)	GJA4	M96789	2.35
Protocadherin 11 Y-linked	PCDH11Y	AI732427	2.35
Tenascin C (hexabrachion)	TNC	BF434846	2.31
BH-protocadherin (brain-heart)	PCDH7	AB006756	2.3
desmocollin 2	DSC2	AU154691	2.22
cadherin-like 24	CDH24	NM_144985	2.17
Thy-1 cell surface antigen	THY1	AA218868	2.15
Cell cycle			
Cdc42 GTPase-activating protein	CDGAP	AB033030	8.52
retinoblastoma-like 1 (p107)	RBL1	BG387892	2.63
Cdk5 and Abl enzyme substrate 1	CABLES1	AI889160	2.37
Apoptosis			
Pro-apoptotic genes			
programmed cell death 4 (neoplastic transformation inhibitor)	PDCD4	BC043171	3.36
apoptotic chromatin condensation inducer 1	ACIN1	NM_014977	2.56
caspase 4, apoptosis-related cysteine peptidase	CASP4	U25804	2.24
programmed cell death 6 /// aryl-hydrocarbon receptor repressor	PDCD6	AB033060	2.18
NIMA (never in mitosis gene a)-related kinase 1	NEK1	AK024912	2.54
Chromatin Remodeling			
helicase (DNA) B	HELB	NM_033647	9.96
L(3)mbt-like 4 (Drosophila)	L3MBTL4	AK026733	4.86
nucleolar protein with MIF4G domain 1	NOM1	AI419857	4.27
SET domain containing 2	SETD2	AF049103	2.26

Cytoskeleton/Cell Differentiation			
Tumor protein D52	TPD52	BF110792	23.21
cripto, FRL-1, cryptic family 1 /// similar to cryptic	CFC1 /// LOC653275	AF312769	8.63
plexin domain containing 1	PLXDC1	AF070526	8.52
CUB and Sushi multiple domains 1	CSMD1	BC016404	7.8
Yip1 domain family, member 4	YIPF4	BG168199	6
collagen, type III, alpha 1 (Ehlers-Danlos syndrome type IV)	COL3A1	AU144167	4.51
microfibrillar-associated protein 2	MFAP2	NM_017459	3.91
fibrillin 1	FBN1	NM_000138	3.62
collagen, type IV, alpha 2	COL4A2	X05610	3.49
Kinesin family member 23	KIF23	AW192521	3.43
Actin related protein 2/3 complex, subunit 5, 16kDa	ARPC5	BE552357	3.22
keratin 17	KRT17	NM_000422	3.15
Microtubule-associated protein 4	MAP4	T75585	3.14
decorin	DCN	AF138302	3.1
keratin 16 (focal non-epidermolytic palmoplantar keratoderma)	KRT16	AF061812	3.09
collagen, type VI, alpha 3	COL6A3	NM_004369	3.05
collagen, type I, alpha 2	COL1A2	NM_000089	3.01
microfibrillar associated protein 5	MFAP5	AW665892	2.99
keratin, hair, acidic, 3B	KRTHA3B	NM_002279	2.76
keratin 6A /// keratin 6C /// keratin 6E	KRT6A	J00269	2.69
pleckstrin homology domain containing, family H member 2	PLEKHH2	AI913749	2.59
keratin 6A /// keratin 6B /// keratin 6C /// keratin 6E	KRT6A /// KRT6B /// KRT6C /// KRT6E	AL569511	2.4
keratin 6B	KRT6B	AI831452	2.3
anillin, actin binding protein (scraps homolog, Drosophila)	ANLN	NM_018685	2.22
lumican	LUM	NM_002345	2.2
septin 6	SPT6	D50918	2.14
Metabolism			
Methylcrotonoyl-Coenzyme A carboxylase 1 (alpha)	MCCC1	AI298089	32.87
ATPase, (Na+)/K+ transporting, beta 4 polypeptide	ATP1B4	NM_012069	18.94
START domain containing 6	STARD6	NM_139171	12.59
acyl-Coenzyme A dehydrogenase family, member 10	ACAD10	NM_025247	12.19
aldo-keto reductase family 1, member C3	AKR1C3	AB018580	12
ATPase, Class I, type 8B, member 3	ATP8B3	BC033179	10
aldolase C, fructose-bisphosphate	ALDOC	NM_005165	8.88
chromosome 18 open reading frame 1	C18orf1	NM_004338	8.73
leucine rich repeat containing 39	LRRC39	AL832694	8.3
lactamase, beta	LACTB	NM_171846	7
SCC-112 protein	SCC-112	AW991219	5.85
glycosyltransferase 8 domain containing 2	GLT8D2	W63754	5.47
Farnesyl-diphosphate farnesyltransferase 1	FDFT1	AA873729	4.94
peptidase inhibitor 15	PI15	AI088609	4.85
Amiloride binding protein 1 (amine oxidase (copper-containing))	ABP1	AA514370	4.56
Ecotropic viral integration site 1	EVI1	BE049061	4.13
ATPase type 13A4	ATP13A4	BG059633	4.05
similar to metallo-beta-lactamase superfamily protein	LOC153364	BC038230	4.02
cytochrome P450, family 3, subfamily A, polypeptide 4	CYP3A4	NM_017460	4
alpha-methylacyl-CoA racemase	AMACR	AI796120	3.62
mucolipin 3	MCOLN3	AW665790	3.61
sulfotransferase family, cytosolic, 1C, member 2	SULT1C2	NM_006588	3.6

hydroxysteroid (11-beta) dehydrogenase 1	HSD11B1	NM_005525	3.47
phospholipase A2, group XIIB	PLA2G12B	BF939574	3.44
gliomedin	GLDN	AW006648	3.4
unc-51-like kinase 4 (C. elegans)	ULK4	NM_017886	3.31
lipase, endothelial	LIPG	NM_006033	3.16
ureidopropionase, beta	UPB1	AF163312	3.13
ubiquitously transcribed tetratricopeptide repeat, X chromosome	UTX	AI140752	2.98
sestrin 3	SESN3	BF685808	2.94
Dynamin 1-like	DNM1L	AA131302	2.87
prostaglandin-endoperoxide synthase 1	PTGS1	BE613133	2.81
transient receptor potential cation channel, subfamily M, member 2	TRPM2	AI051254	2.78
pyruvate dehydrogenase kinase, isozyme 2	PDK2	AL574319	2.72
ferrochelatase (protoporphyria)	FECH	AU152635	2.69
cytochrome P450, family 20, subfamily A, polypeptide 1	CYP20A1	NM_020674	2.68
F-box and leucine-rich repeat protein 17	FBXL17	BE380031	2.61
phospholipase A2, group IB (pancreas)	PLA2G1B	NM_000928	2.6
Synaptosomal-associated protein, 25kDa	SNAP25	AI806346	2.54
downregulated in ovarian cancer 1	DOC1	NM_014890	2.53
lysyl oxidase-like 2	LOXL2	NM_002318	2.52
6-phosphogluconolactonase	PGLS	AA694178	2.5
Mannosyl	MGAT4A	BC031487	2.45
aminolevulinate, delta-, dehydratase	ALAD	BC000977	2.45
arylacetamide deacetylase-like 2	AADACL2	AA027115	2.39
glutamic-oxaloacetic transaminase 1-like 1	GOT1L1	NM_152413	2.38
transmembrane 4 L six family member 1	TM4SF1	AI760128	2.38
hemoglobin, beta /// hemoglobin, beta	HBB	AF349114	2.37
HERV-H LTR-associating 2	HHLA2	AK026893	2.31
leucine rich repeat containing 46	LRRC46	AL537303	2.27
hyaluronan synthase 3	HAS3	AF232772	2.2
HECT, C2 and WW domain containing E3 ubiquitin protein ligase 2	HECW2	AL390186	2.13
Proteolysis			
N-acetylated alpha-linked acidic dipeptidase 2	NAALAD2	BC038840	11.36
Ubiquitin specific peptidase 53	USP53	BF196943	4.52
serpin peptidase inhibitor, clade A	SERPINA3	NM_001085	3.33
kallikrein 13	KLK13	AL050220	3.27
Proteasome (prosome, macropain) subunit, beta type, 7	PSMB7	AI762915	2.85
complement factor D (adipsin)	CFD	NM_001928	2.82
proprotein convertase subtilisin/kexin type 5	PCSK5	NM_006200	2.82
ADAM metallopeptidase with thrombospondin type 1 motif, 5	ADAMTS5	BF060767	2.81
ADAM metallopeptidase with thrombospondin type 1 motif, 9	ADAMTS9	AL832835	2.75
ring finger protein 128	RNF128	NM_024539	2.61
Ubiquitin specific peptidase 40	USP40	AA522888	2.6
plasminogen activator, tissue	PLAT	NM_000930	2.56
ADAM metallopeptidase domain 23	ADAM23	NM_003812	2.22
ADAM metallopeptidase with thrombospondin type 1 motif, 20	ADAMTS20	NM_025003	2.18
matrix metallopeptidase 12 (macrophage elastase)	MMP12	NM_002426	2.17
ADAM metallopeptidase with thrombospondin type 1 motif, 1	ADAMTS1	AK023795	2.16
TIMP metallopeptidase inhibitor 1	TIMP1	NM_003254	2.13
RNA Processing			

Nuclear cap binding protein subunit 1, 80kDa	NCBP1	AA905353	11.8
muscleblind-like 2 (Drosophila)	MBNL2	AI088145	6.02
mitochondrial ribosomal protein S25	MRPS25	AW341440	2.72
DEAD (Asp-Glu-Ala-Asp) box polypeptide 54	DDX54	AI346600	2.59
Signaling			
MCF.2 cell line derived transforming sequence	MCF2	AB085901	31.29
synapsin II	SYN2	NM_133625	16.22
minor histocompatibility antigen HB-1	HB-1	NM_021182	15.43
Ras protein-specific guanine nucleotide-releasing factor 1	RASGRF1	AL359931	14.24
guanine nucleotide binding protein (G protein), gamma 2	GNG2	AK026424	13.7
adrenergic, alpha-1A-, receptor	ADRA1A	D32201	12.78
anaplastic lymphoma kinase (Ki-1)	ALK	NM_004304	11.4
regulator of G-protein signalling 18	RGS18	AF076642	9.9
urotensin 2	UTS2	NM_021995	9.02
urotensin 2	UTS2	NM_021995	9.02
thymus expressed gene 3-like	MGC15476	AI809234	8.84
thioredoxin reductase 2	TXNRD2	AF201385	7.11
complement component (3b/4b) receptor 1 (Knops blood group)	CR1	AI052659	6.99
F-box protein 34	FBXO34	BC020583	6.44
Guanine nucleotide binding protein (G protein), gamma 7	GNG7	AK001151	6.08
S100 calcium binding protein A9 (calgranulin B)	S100A9	NM_002965	5.95
Dihydropyrimidinase-like 3	DPYSL3	AW444511	5.84
cholinergic receptor, nicotinic, beta 4	CHRNB4	NM_000750	5.66
klotho	KL	NM_004795	5.47
Gamma-aminobutyric acid (GABA) A receptor, beta 3	GABRB3	R59869	5.12
ADAM metallopeptidase domain 10	ADAM10	AF090948	5.04
chemokine (C-X-C motif) ligand 6	CXCL6	NM_002993	4.54
RAP1, GTP-GDP dissociation stimulator 1	RAP1GDS1	AI052055	4.3
glutamate receptor, ionotropic, kainate 2	GRIK2	BC037954	4.07
thyroid stimulating hormone receptor	TSHR	BE045816	3.93
Calcium regulated heat stable protein 1, 24kDa	CARHSP1	BC041650	3.87
fibroblast growth factor receptor 1	FGFR1	NM_023107	3.77
KDEL (Lys-Asp-Glu-Leu)	KDELR3	NM_016657	3.73
delta-notch-like EGF repeat-containing transmembrane	DNER	BF059512	3.69
G protein-coupled receptor 1	GPR1	AL046992	3.66
Doublecortin and CaM kinase-like 1	DCAMKL1	AI129626	3.47
coagulation factor II (thrombin) receptor	F2R	NM_001992	3.45
G patch domain containing 2	GPATC2	AA160529	3.39
fibroblast growth factor binding protein 1	FGFBP1	NM_005130	3.39
chemokine orphan receptor 1	CMKOR1	AI817041	3.35
G protein-coupled receptor 4	GPR4	NM_005282	3.32
Kinesin-associated protein 3	KIFAP3	AJ012497	3.29
Chemokine binding protein 2	CCBP2	AI088640	3.19
Ksp37 protein	KSP37	AB021123	3.18
amyloid beta (A4) precursor protein	APP	BC004369	3.15
alpha-kinase 2	ALPK2	BE551416	3.14
chemokine (C-X-C motif) receptor 4	CXCR4	AJ224869	3.1
EGF, latrophilin and seven transmembrane domain containing 1	ELTD1	NM_022159	3.08
Fc fragment of IgE, high affinity I, receptor	FCER1A	BC005912	3.06
dickkopf homolog 1 (Xenopus laevis)	DKK1	NM_012242	3.03
ras-related C3 botulinum toxin substrate 1	RAC1	AJ012502	2.92
ghrelin/obestatin preprohormone	GHRL	AB035700	2.89

Interleukin 12 receptor, beta 2	IL12RB2	R01220	2.88
CUG triplet repeat, RNA binding protein 1	CUGBP1	N52821	2.87
stathmin 1/oncoprotein 18	STMN1	AV756729	2.83
RAS-like, estrogen-regulated, growth inhibitor	RERG	AW294092	2.83
RAB39B, member RAS oncogene family	RAB39B	AV724323	2.82
phosphodiesterase 1A, calmodulin-dependent	PDE1A	AU146305	2.82
neurotrophic tyrosine kinase, receptor, type 2	NTRK2	AA707199	2.8
Hepatoma-derived growth factor, related protein 3	HDGFRP3	AW207448	2.77
transportin 3	TNPO3	AF145029	2.77
Cholinergic receptor, nicotinic, alpha 10	CHRNA10	AA004906	2.75
relaxin 1 /// relaxin 1	RLN1	BC005956	2.66
secreted protein, acidic, cysteine-rich (osteonectin)	SPARC	AL575922	2.65
Ras association (RalGDS/AF-6) domain family 5	RASSF5	BC004270	2.64
v-raf murine sarcoma 3611 viral oncogene homolog	ARAF	AI760277	2.63
SPARC related modular calcium binding 2	SMOC2	AB014737	2.61
Slit homolog 2 (Drosophila)	SLIT2	AI692523	2.58
chimerin (chimaerin) 1	CHN1	BF339445	2.56
CD53 molecule	CD53	NM_000560	2.54
chemokine (C-C motif) receptor-like 1	CCRL1	NM_016557	2.49
Fibroblast growth factor 18	FGF18	AI798863	2.48
transforming growth factor, beta-induced, 68kDa	TGFBI	NM_000358	2.47
Stanniocalcin 1	STC1	AW003173	2.47
Taste receptor, type 2, member 14	TAS2R14	BF224068	2.46
chemokine (C-X-C motif) ligand 12 (stromal cell-derived factor 1)	CXCL12	U19495	2.44
platelet-derived growth factor receptor, alpha polypeptide	PDGFRA	NM_006206	2.44
tubby like protein 3	TULP3	AI591305	2.43
regulator of G-protein signalling 5	RGS5	NM_025226	2.43
Rap guanine nucleotide exchange factor (GEF) 6	RAPGEF6	BF003148	2.42
chemokine (C-X-C motif) ligand 5	CXCL5	AK026546	2.4
5-hydroxytryptamine (serotonin) receptor 2A	HTR2A	NM_000621	2.39
diacylglycerol kinase, epsilon 64kDa	DGKE	BC022297	2.36
insulin-like growth factor binding protein 5	IGFBP5	AW007532	2.36
sclerostin domain containing 1	SOSTDC1	AI927000	2.31
Muscle RAS oncogene homolog	MRAS	BE219446	2.29
neuropilin 1	NRP1	AF145712	2.28
Rap guanine nucleotide exchange factor (GEF) 4	RAPGEF4	NM_007023	2.27
growth differentiation factor 11	GDF11	AF028333	2.25
chordin-like 1	CHRDL1	AL049176	2.25
interleukin 1 receptor, type I	IL1R1	NM_000877	2.25
prostaglandin E receptor 3 (subtype EP3)	PTGER3	X83858	2.24
vascular endothelial growth factor	VEGF	AF091352	2.21
inversin /// inversin	INVS	BC006370	2.2
Protein kinase C, epsilon	PRKCE	AL831856	2.18
colony stimulating factor 2 receptor, beta, low-affinity	CSF2RB	AV756141	2.18
coagulation factor II (thrombin) receptor-like 2	F2RL2	AI378647	2.18
Protein tyrosine phosphatase, non-receptor type 2	PTPN2	N53696	2.15
kinase insert domain receptor (a type III receptor tyrosine kinase)	KDR	NM_002253	2.14
interleukin 1 family, member 9	IL1F9	NM_019618	2.14
thyroid hormone receptor interactor 10	TRIP10	NM_004240	2.13
mitochondrial tumor suppressor 1	MTUS1	AI695017	2.12
secreted protein, acidic, cysteine-rich (osteonectin)	SPARC	NM_003118	2.11
vascular endothelial growth factor	VEGF	AF022375	2.1
regulator of G-protein signalling 7	RGS7	NM_002924	2.1
suppressor of cytokine signaling 2	SOCS2	NM_003877	2.1

Transcription			
Transcription elongation regulator 1	TCERG1	AI688461	27.02
Cofactor required for Sp1 transcriptional activation, subunit 2	CRSP2	BC013392	18.82
v-ets erythroblastosis virus E26 oncogene like (avian)	ERG	AA296657	11.52
inscuteable	INSC	BF432206	10.81
MADS box transcription enhancer factor 2, polypeptide C	MEF2C	AW263527	10.57
Early B-cell factor	EBF	AU145682	7.6
interferon regulatory factor 8 /// interferon regulatory factor 8	IRF8	AI073984	4.75
GATA binding protein 6	GATA6	BF002339	4.28
AF4/FMR2 family, member 4	AFF4	BC025700	3.62
vestigial like 3 (Drosophila)	VGLL3	AI754423	3.52
ras responsive element binding protein 1	RREB1	AU147182	3.48
GATA binding protein 2	GATA2	AL563460	3.14
Pre-B-cell leukemia transcription factor 1	PBX1	AW074143	3.08
Transducin-like enhancer of split 1 (E(sp1) homolog, Drosophila)	TLE1	AK000144	2.97
musculin (activated B-cell factor-1)	MSC	AF060154	2.91
iroquois homeobox protein 3	IRX3	AI681917	2.83
forkhead box E1 (thyroid transcription factor 2)	FOXE1	NM_004473	2.8
zinc finger protein 160	ZNF160	AA701249	2.72
runt-related transcription factor 1	RUNX1	NM_001754	2.67
activating transcription factor 7 interacting protein	ATF7IP	AK021569	2.52
mastermind-like 2 (Drosophila)	MAML2	AI769569	2.49
v-maf musculoaponeurotic fibrosarcoma oncogene homolog	MAF	AF055376	2.49
Spi-B transcription factor (Spi-1/PU.1 related)	SPIB	NM_003121	2.48
SRY (sex determining region Y)-box 9	SOX9	NM_000346	2.47
ataxin 3-like	ATXN3L	AB050195	2.41
zinc finger, DHHC-type containing 4	ZDHHC4	NM_018106	2.4
zinc finger protein 365	ZNF365	NM_014951	2.39
Zinc finger protein 283	ZNF283	AW592246	2.38
hepatic leukemia factor	HLF	M95585	2.33
inhibitor of DNA binding 4	ID4	AW157094	2.33
Pogo transposable element with ZNF domain	POGZ	AW966903	2.32
forkhead box C1	FOXC1	NM_001453	2.32
zinc finger protein, subfamily 1A, 4 (Eos)	ZNFN1A4	NM_022465	2.27
twist homolog 2 (Drosophila)	TWIST2	AI086614	2.25
zinc finger protein 165	ZNF165	NM_003447	2.11
homeobox, hematopoietically expressed	HHEX	NM_001529	2.11

Supplementary Table S2. PCR primers

Gene symbol	Accession number	Forward Primer	Reverse Primer
KRT17	NM_000422	TACCTGAAGAAGAACCAC	CATCTCCACATTGATCTC
KRTAP4-7	AJ406939	TGACTCTGTGAGAACATT	ACTGAGAAGGAGAATCTG
KRTAP3-2	AJ406932	TGCCAGATGTTAAGGTAG	AACATGAATCTGAGGTCTT
KRTAP1-3	NM_030966	CGATTTACCTTGAAACTGAG	GTGGGATACAGGAAGTGA
KRTAP9-9	NM_030975	TGCTCAACTGACTTATCT	CACATGATTCACAAGGTAT
TNFRSF10D	NM_003840	TTACGGATATAGTCATTCTAGG	ACTTCAGGCAGTTCTAAC
TRAIL receptor 2	AF016266	TGTAAGATGTCACTGTCTG	CCTGTAGAAGTTGCCAAT
FAS	NM_000043	AGATACTAACTGCTCTCA	TTACCATTGCTATGTATAAG
CFLAR	AF015452	AACAAGAACCAGTGAAGA	CGATTATCAGGCAGATTC
KRT6a	J00269	AAGAAGGATGTGGATGCT	ATACAAGGCTCTCAGGAA
PDCD6	NM_001267556	TGAAGAGCAGCACAACAT	TGAAGAGCAGCACAACAT
CASP4	NM_001225	CATAGAACGACTGTCCAT	TGCTCCTTGAAGTTGATT
ACIN1	XM_005267415	ATCTTCCTCCTCCAGTTCTA	ATCTGAGCGGTGAATGAG
PDCD4	NM_001199492	GACAGTAATGAGCACAAC	ACACAATCTACAGTTCCTT
TNFSF15	NM_001204344	TTGGAGGATTGGCGAGTT	TGTATAGCAGGAAGGTGTTGA
TRIAP1	NM_016399	ATTCTTCTTGACCTTGAC	AATCTGATGGCTATGTTC
BCL6B	NM_181844	CCTTGATTGATAGTTCTG	TTATTGTTGAAGTTCTACC
BCL10	NM_003921	ATCTTCTCTTCAACTACA	TTCCTTCTTCTTCTAACT
TP53INP1	NM_001135733	TTGAGTGAGAAGACAGTT	CATTGAGGAGGAAGAGAA
BCL2	NM_000633	ACATCCTATCAACAACAA	GTATCTACACTACAGTCTTA
BCL2A1	NM_001114735	AGACGGCATCATTAACTG	CTCCTTATAGGTATCCACATC

Supplementary Table S3. Primary antibodies

Antigen	Dilution	Supplier	Catalog number
Ki67	1:100	Abcam	ab15580
p53 (phospho-S15)	1:100	Abcam	ab38497
CD95/FAS/APO-1	1:1000	BD Biosciences Pharmingen	554255
P21 (M-19)	1:1000	Santa Cruz Biotechnology	sc-471
KAP1	1:200	Gift of Drs. J. Schweizer and L. Langbein	N/A
TRAIL	1:100	Cell Signaling Technology	3219
TRAIL Receptor 1 (DR-4-02)	1:100	Thermo Scientific Pierce Antibodies	MA1-19025
FLIP	1:100	Abcam	Ab167409
Caspase-8	1:2000	IMGENEX	IMG-5703