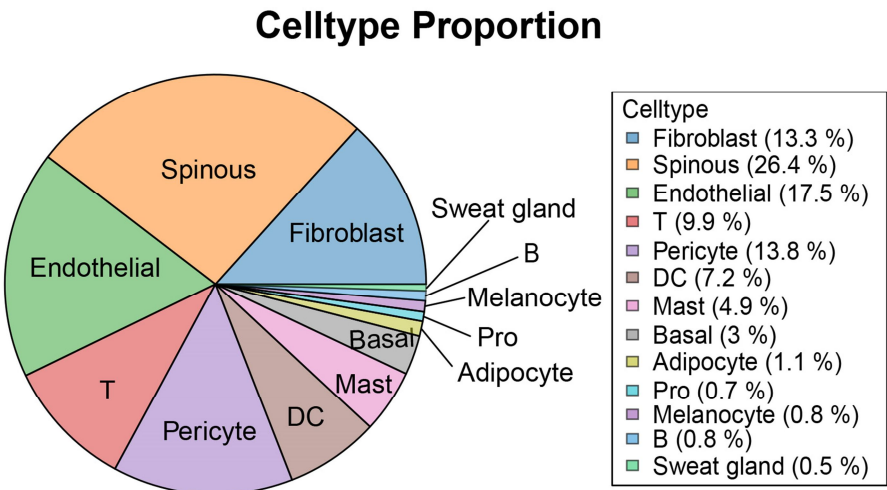


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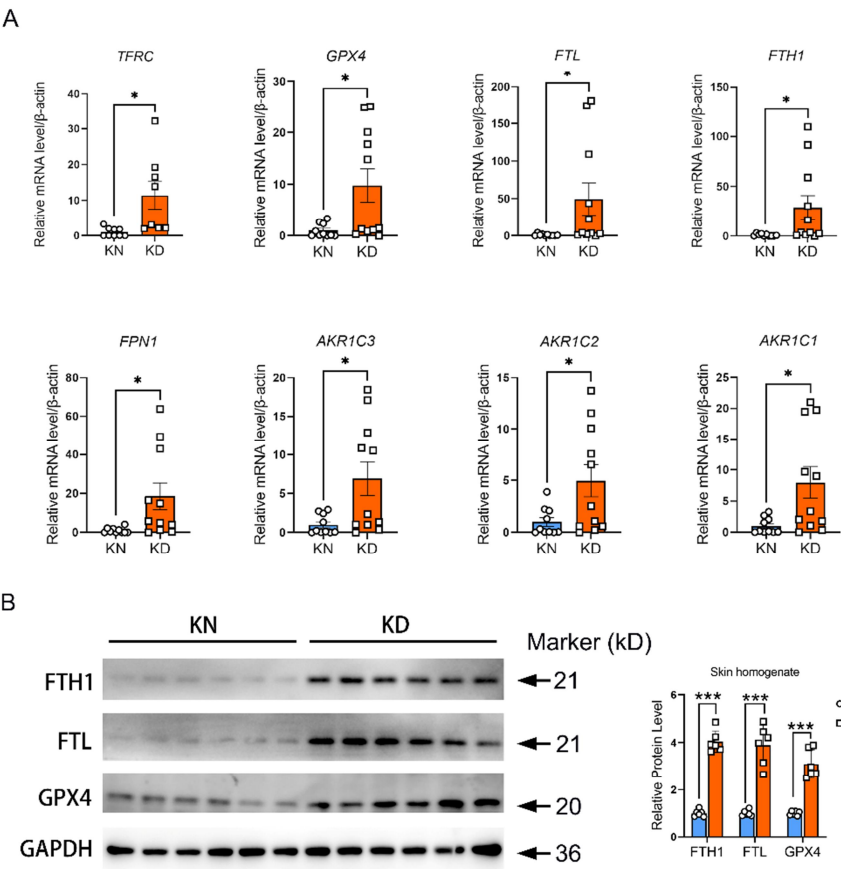
Supplemental Data

Supplemental Figures
Supplemental Figure 1



The relative abundance and distribution of major cell populations in KN and KD skins.

1 **Supplemental Figure 2**



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3 **Supplementary Figure 2. Increased iron metabolism and antioxidant genes in**
4 **skin tissue homogenate. (A)** mRNA levels of iron metabolism and antioxidant genes
5 in skin tissue homogenate. $N \geq 10$ per group. **(B)** FTH1, FTL, and GPX4 protein
6 levels in skin tissue homogenate. $N = 6$ per group. The student's t-test calculates data
7 in A. Data in B are evaluated using the Student's t-test and corrected using the
8 Benjamini-Hochberg procedure. Data are represented as mean $\pm$ SEM. * $P < 0.05$; ** P
9 < 0.001 ; *** $P < 0.001$.

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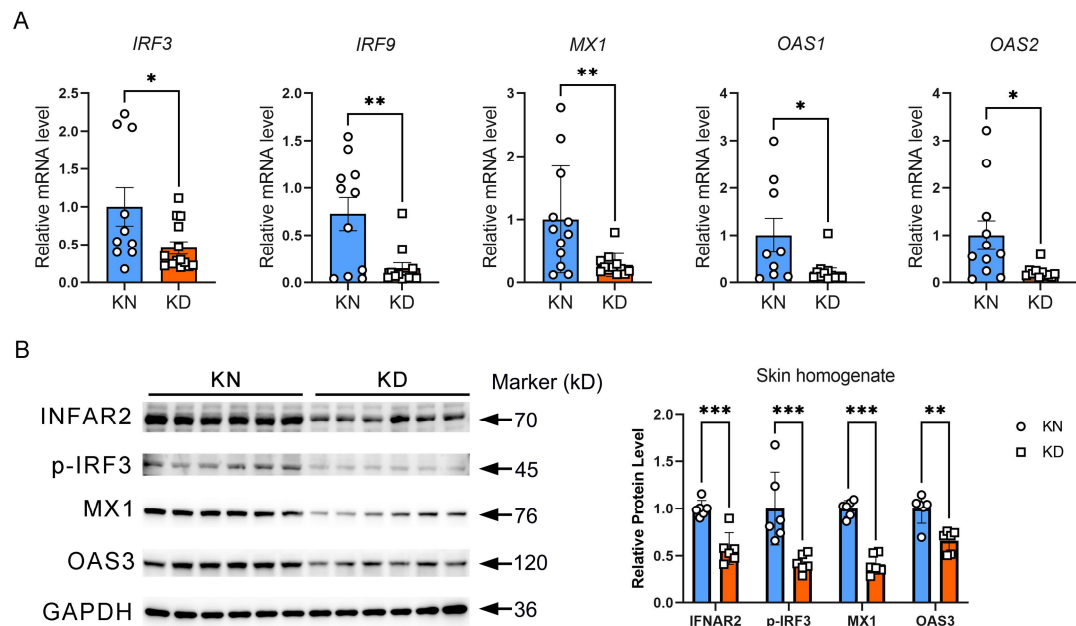
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1 **Supplemental Figure 3**



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3 **Supplementary Figure 3. Decreased interferon signaling in skin tissue**
4 **homogenate. (A)** mRNA levels of *IRF3*, *IRF9*, *MX1*, *OAS1*, and *OAS2* genes in skin
5 tissue homogenate. N ≥ 10 per group. **(B)** IFNAR2, p-IRF3, MX1, and OAS3 protein
6 levels in skin tissue homogenate. N = 6 per group. The student's t-test calculates all
7 the data in A. Data are represented as mean ± SEM. *P < 0.05; **P < 0.001; ***P <
8 0.001.

1 **Supplemental Tables**

2 **Supplemental Table S1 Gene panel for evaluating ferroptosis resistance scores.**

Gene Symbol	Official Full Name (NCBI)
SLC7A11	solute carrier family 7 member 11
GPX4	glutathione peroxidase 4
AKR1C1	aldo-keto reductase family 1 member C1
AKR1C2	aldo-keto reductase family 1 member C2
AKR1C3	aldo-keto reductase family 1 member C3
RB1	RB transcriptional corepressor 1
HSPB1	heat shock protein family B (small) member 1
HSF1	heat shock transcription factor 1
GCLC	glutamate-cysteine ligase catalytic subunit
NFE2L2	nuclear factor, erythroid 2 like 2
SQSTM1	sequestosome 1
NQO1	NAD(P)H quinone dehydrogenase 1
HMOX1	heme oxygenase 1
FTH1	ferritin heavy chain 1
MUC1	mucin 1, cell surface associated
SLC3A2	solute carrier family 3 member 2
MT1G	metallothionein 1G
SLC40A1	solute carrier family 40 member 1
CISD1	CDGSH iron sulfur domain 1
FANCD2	FA complementation group D2
FTMT	ferritin mitochondrial
HSPA5	heat shock protein family A (Hsp70) member 5
ATF4	activating transcription factor 4
TP53	tumor protein p53
HELLS	helicase, lymphoid-specific
SCD	stearoyl-CoA desaturase
FADS2	fatty acid desaturase 2
SRC	SRC proto-oncogene, non-receptor tyrosine kinase
STAT3	signal transducer and activator of transcription 3
PML	promyelocytic leukemia
MTOR	mechanistic target of rapamycin kinase
NFS1	NFS1 cysteine desulfurase
TP63	tumor protein p63
CDKN1A	cyclin dependent kinase inhibitor 1A
ENPP2	ectonucleotide pyrophosphatase/phosphodiesterase 2
VDAC2	voltage dependent anion channel 2
FH	fumarate hydratase
CISD2	CDGSH iron sulfur domain 2

CBS	cystathionine beta-synthase
ISCU	iron-sulfur cluster assembly enzyme
ACSL3	acyl-CoA synthetase long chain family member 3
OTUB1	OTU deubiquitinase, ubiquitin aldehyde binding 1
CD44	CD44 molecule
BRD4	bromodomain containing 4
PRDX6	peroxiredoxin 6
SESN2	sestrin 2
NF2	NF2, moesin-ezrin-radixin like (MERLIN) tumor suppressor
ARNTL	aryl hydrocarbon receptor nuclear translocator like
HIF1A	hypoxia inducible factor 1 subunit alpha
JUN	Jun proto-oncogene, AP-1 transcription factor subunit
CA9	carbonic anhydrase 9
TMBIM4	transmembrane BAX inhibitor motif containing 4
PLIN2	perilipin 2
AIFM2	apoptosis inducing factor mitochondria associated 2
LAMP2	lysosomal associated membrane protein 2
ZFP36	ZFP36 ring finger protein
PROM2	prominin 2
CHMP5	charged multivesicular body protein 5
CHMP6	charged multivesicular body protein 6
CAV1	caveolin 1
GCH1	GTP cyclohydrolase 1
SIRT3	sirtuin 3
DAZAP1	DAZ associated protein 1
PIR	pirin
FTL	ferritin light chain
HCAR1	hydroxycarboxylic acid receptor 1
SLC16A1	solute carrier family 16 member 1
RRM2	ribonucleotide reductase regulatory subunit M2
NR4A1	nuclear receptor subfamily 4 group A member 1
PIK3CA	phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit alpha
RPTOR	regulatory associated protein of MTOR complex 1
SREBF1	sterol regulatory element binding transcription factor 1
SREBF2	sterol regulatory element binding transcription factor 2
FZD7	frizzled class receptor 7
P4HB	prolyl 4-hydroxylase subunit beta
NT5DC2	5'-nucleotidase domain containing 2
BCAT2	branched chain amino acid transaminase 2
PLA2G6	phospholipase A2 group VI
PARK7	Parkinsonism associated deglycase
FXN	frataxin

SUV39H1	suppressor of variegation 3-9 homolog 1
ATF2	activating transcription factor 2
ACOT1	acyl-CoA thioesterase 1
ALDH3A2	aldehyde dehydrogenase 3 family member A2
STK11	serine/threonine kinase 11
FNDC5	fibronectin type III domain containing 5
CDH1	cadherin 1
NEDD4L	NEDD4 like E3 ubiquitin protein ligase
TF	transferrin
BRD2	bromodomain containing 2
BRD3	bromodomain containing 3
BRDT	bromodomain testis associated
DECR1	2,4-dienoyl-CoA reductase 1
GLRX5	glutaredoxin 5
NCOA3	nuclear receptor coactivator 3
NR5A2	nuclear receptor subfamily 5 group A member 2
PANX2	pannexin 2
TFAP2A	transcription factor AP-2 alpha
CP	ceruloplasmin
ARF6	ADP ribosylation factor 6
GDF15	growth differentiation factor 15
ABHD12	abhydrolase domain containing 12
PPP1R13L	protein phosphatase 1 regulatory subunit 13 like
TFAM	transcription factor A, mitochondrial
KDM3B	lysine demethylase 3B
AHCY	adenosylhomocysteinase
IDH2	isocitrate dehydrogenase (NADP(+)) 2
PPARA	peroxisome proliferator activated receptor alpha
NOS2	nitric oxide synthase 2
SIAH2	siah E3 ubiquitin protein ligase 2
RELA	RELA proto-oncogene, NF-kB subunit
PRKAA2	protein kinase AMP-activated catalytic subunit alpha 2
VDR	vitamin D receptor
NEDD4	NEDD4 E3 ubiquitin protein ligase
PRDX1	peroxiredoxin 1
AR	androgen receptor
MTF1	metal regulatory transcription factor 1
COPZ1	COPI coat complex subunit zeta 1
NUPR1	nuclear protein 1, transcriptional regulator
USP35	ubiquitin specific peptidase 35
NEAT1	nuclear paraspeckle assembly transcript 1
PARP1	poly(ADP-ribose) polymerase 1
PARP2	poly(ADP-ribose) polymerase 2

PARP3	poly(ADP-ribose) polymerase 3
PARP4	poly(ADP-ribose) polymerase family member 4
PARP6	poly(ADP-ribose) polymerase family member 6
PARP8	poly(ADP-ribose) polymerase family member 8
PARP9	poly (ADP-ribose) polymerase family member 9
PARP10	poly(ADP-ribose) polymerase family member 10
PARP11	poly(ADP-ribose) polymerase family member 11
PARP12	poly(ADP-ribose) polymerase family member 12
PARP14	poly(ADP-ribose) polymerase family member 14
PARP15	poly(ADP-ribose) polymerase family member 15
PARP16	poly(ADP-ribose) polymerase family member 16
PDSS2	decaprenyl diphosphate synthase subunit 2
TXN	thioredoxin
SENP1	SUMO specific peptidase 1
OIP5-AS1	OIP5 antisense RNA 1
CREB1	cAMP responsive element binding protein 1
CREB3	cAMP responsive element binding protein 3
CREB5	cAMP responsive element binding protein 5
GOT1	glutamic-oxaloacetic transaminase 1
TFRC	transferrin receptor
BEX1	brain expressed X-linked 1
ASAH2	N-acylsphingosine amidohydrolase 2
FABP4	fatty acid binding protein 4
AKT1S1	AKT1 substrate 1
MLST8	MTOR associated protein, LST8 homolog
SIRT1	sirtuin 1
TYRO3	TYRO3 protein tyrosine kinase
SIRT6	sirtuin 6
TMSB4X	thymosin beta 4, X-linked
TMSB4Y	thymosin beta 4, Y-linked
KIF20A	kinesin family member 20A
ECH1	enoyl-CoA hydratase 1
ETV4	ETS variant transcription factor 4
MEG8	maternally expressed 8
VCP	valosin containing protein
RBMS1	RNA binding motif single stranded interacting protein 1
KDM4A	lysine demethylase 4A
MGST1	microsomal glutathione S-transferase 1
MPC1	mitochondrial pyruvate carrier 1
CHMP1A	charged multivesicular body protein 1A
CAMKK2	calcium/calmodulin dependent protein kinase kinase 2
SOX2	SRY-box transcription factor 2
SRSF9	serine and arginine rich splicing factor 9

PROK2	prokineticin 2
SIRT2	sirtuin 2
MEF2C	myocyte enhancer factor 2C
EZH2	enhancer of zeste 2 polycomb repressive complex 2 subunit
SMPD1	sphingomyelin phosphodiesterase 1
ADAMTS13	ADAM metallopeptidase with thrombospondin type 1 motif 13
CDC25A	cell division cycle 25A
G6PD	glucose-6-phosphate dehydrogenase
PPARD	peroxisome proliferator activated receptor delta
ENO3	enolase 3
LCN2	lipocalin 2
TRIB2	tribbles pseudokinase 2
DHODH	dihydroorotate dehydrogenase
PDK4	pyruvate dehydrogenase kinase 4
MIR9-3HG	MIR9-3 host gene
IL6	interleukin 6
PTPN18	protein tyrosine phosphatase non-receptor type 18
ABCC5	ATP binding cassette subfamily C member 5
CISD3	CDGSH iron sulfur domain 3
MS4A15	membrane spanning 4-domains A15
FURIN	furin, paired basic amino acid cleaving enzyme
GALNT14	polypeptide N-acetylgalactosaminyltransferase 14
KLHDC3	kelch domain containing 3
MAPKAP1	MAPK associated protein 1
PRR5	proline rich 5
RICTOR	RPTOR independent companion of MTOR complex 2
GSTM1	glutathione S-transferase mu 1
RARRES2	retinoic acid receptor responder 2
USP11	ubiquitin specific peptidase 11

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1 **Supplemental Table S2**

Characteristics of paired keloid patients (KD and KN)	
Age (years), mean $\pm$ SD	35 $\pm$ 9
Gender	
Female	N=7
Male	N=5
Site of Specimen	
Ear	N=3
Chest	N=6
Shoulder	N=3
Characteristics of unpaired keloid patients (KD)	
Age (years), mean $\pm$ SD	40 $\pm$ 4
Gender	
Female	N=10
Male	N=8
Site of Specimen	
Chest	N=5
Ear	N=3
Hip	N=3
Shoulder	N=5
Neck	N=2

N, Number of patients

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1 **Supplemental Table S3**

qRT-PCR Primers	Sequence (5'-3')
<i>α-SMA</i>	F: CTGAACGAGAACCAAGTGCG; R: ACGAACCTCTTGCACATTTGA
<i>ACSL4</i>	F: ACTGGCCGACCTAAGGGAG; R: GCCAAAGGCAAGTAGCCAATA
<i>ADIPOQ</i>	F: TGCTGGGAGCTGTTCTACTG; R: TACTCCGGTTTCACCGATGTC
<i>AKR1C1</i>	F: TTCATGCCTGTCCTGGGATT; R: CTGGCTTTACAGACACTGGAAAA
<i>AKR1C2</i>	F: CAACTTCAACCACAGGCTGC; R: GTCTGATGCGCTGCTCATTG
<i>AKR1C3</i>	F: GAGAGCAGAAGACCGAAAGGA; R: CACAACACCACGTTATCGGG
<i>COL1A1</i>	F: GTGGGCAACGACTCTGGAC; R: GCTTCGACATCAGCATTCTCA
<i>COL1A2</i>	F: GATCACCCGAATGGCTATGAAT; R: GGGGTCACAGTTGTCAATGTT
<i>COL3A1</i>	F: CACAACACGCTGTTTCGGCTA; R: CGATCCTGCATCTGTAAATCGC
<i>EIF2AK2</i>	F: GCCGCTAAACTTGCATATCTTCA; R: TCACACGTAGTAGCAAAAGAACC
<i>FN1</i>	F: CGGTGGCTGTCAGTCAAAG; R: AAACCTCGGCTTCCTCCATAA
<i>FTH1</i>	F: CCCCCATTTGTGTGACTTCAT; R: GCCCGAGGCTTAGCTTTCATT
<i>FTL</i>	F: CAGCCTGGTCAATTTGTACCT; R: GCCAATTCGCGGAAGAAGTG
<i>GAPDH</i>	F: GGAGCGAGATCCCTCCAAAAT; R: GGCTGTTGTCATACTTCTCATGG
<i>GPX4</i>	F: GAGGCAAGACCGAAGTAACTAC; R: CCGAACTGGTTACACGGGAA
<i>IRF3</i>	F: AGAGGCTCGTGATGGTCAAG; R: AGGTCCACAGTATTCTCCAGG
<i>IRF9</i>	F: GCCCTACAAGGTGTATCAGTTG; R: TGCTGTGCTTTGATGGTACT
<i>ISG15</i>	F: CGCAGATCACCCAGAAGATCG; R: TTCGTGCGATTTGTCCACCA
<i>MX1</i>	F: GTTTCGGAAGTGGACATCGCA; R: CTGCACAGGTTGTTCTCAGC
<i>MX2</i>	F: CAGAGGCAGCGGAATCGTAA; R: TGAAGCTCTAGCTCGGTGTTC

<i>NFE2L2</i>	F: TCAGCGACGGAAAGAGTATGA; R: CCACTGGTTTCTGACTGGATGT
<i>OAS1</i>	F: TGTCCAAGGTGGTAAAGGGTG; R: CCGGCGATTAACTGATCCTG
<i>OAS2</i>	F: CTCAGAAGCTGGGTTGGTTTAT; R: ACCATCTCGTCGATCAGTGTC
<i>PLIN1</i>	F: TGTGCAATGCCTATGAGAAGG; R: AGGGCGGGGATCTTTTCCT
<i>SLC3A2</i>	F: TGAATGAGTTAGAGCCCGAGA; R: GTCTTCCGCCACCTTGATCTT
<i>SLC40A1</i>	F: CTACTTGGGGAGATCGGATGT; R: CTGGGCCACTTTAAGTCTAGC
<i>SLC7A11</i>	F: TCTCCAAAGGAGGTTACCTGC; R: AGACTCCCCTCAGTAAAGTGAC
<i>TFRC</i>	F: ACCATTGTCATATACCCGGTTCA; R: CAATAGCCCAAGTAGCCAATCAT
<i>TGF-β1</i>	F: GGCCAGATCCTGTCCAAGC; R: GTGGGTTTCCACCATTAGCAC