Table S1. Clinical characteristics of the patients and donors

Group	UPN	Age (years)	Diagnosis	Type of transplant	Months from transplant
Cord blood unit	1.01	0			
	1.02	0			
	1.03	0			
	1.04	0			
	1.05	0			
	1.06	0			
	1.07	0			
	1.08	0			
	1.09	0			
	1.10	0			
	1.11	0			
	1.12	0			
Adult donors	2.01	22			
	2.02	28			
	2.03	43			
	2.04	36			
	2.05	42			
	2.06	62			
	2.07	47			
	2.08	21			
	2.09	57			
	2.10	55			
	2.11	25			
	2.12	44			
	2.13	38			
	2.14	45			
	2.15	54			
Adult pts post UCBT	3.01	29	AML	IB-UCBT	60
	3.02	50	AML	IB-UCBT	48
	3.03	30	ALL	IB-UCBT	4

	3.04	50	AML	IB-UCBT	90
	3.05	44	AML	IB-UCBT	24
	3.06	22	SAA	IB-UCBT	5
	3.07	20	SAA	IB-UCBT	1
	3.08	18	SAA	IB-UCBT	3
	3.09	54	MDS	IB-UCBT	8
	3.10	55	AML	IB-UCBT	13
	3.11	32	AML	IB-UCBT	12
	3.12	18	ALL	IB-UCBT	5
	3.13	18	AML	IB-UCBT	1
Pts post adult HSC	4.01	36	AML	PBSCT	7
	4.02	62	ALL	PBSCT	3
	4.03	61	CML	PBSCT	2
	4.04	53	AML	PBSCT	1
	4.05	34	AML	PBSCT	18
	4.06	10	ALL	BMT	1

Group	UPN	Age (years)	Diagnosis	Type of transplant	Months from transplant
Pts post adult HSC	4.07	7	FA	PBSCT	2
	4.08	9	ALL	PBSCT	1
	4.09	17	AML	PBSCT	1
	4.10	17	AML	PBSCT	5
	4.11	10	ALL	BMT	5
	4.12	6	Thal	PBSCT	4
	4.13	13	CML	PBSCT	2
	4.14	2	Thal	BMT	3
	4.15	2	Thal	BMT	4
	4.16	3	ALL	PBSCT	1
	4.17	5	ALL	PBSCT	3
	4.18	15	AML	PBSCT	2
	4.19	8	AML	PBSCT	1
	4.20	5	MDS	PBSCT	1
	4.21	2	AML	PBSCT	1

4.22	7	AML	PBSCT	6
4.23	15	AML	PBSCT	3
4.24	11	ALL	PBSCT	1
4.25	5	AML	PBSCT	1
4.26	6	Thal	PBSCT	1
4.27	2	ALL	BMT	6
4.28	10	ALL	PBSCT	3
4.29	2	ALL	PBSCT	1

Table S2. List of analysed genes

Gene	Assay code	Antibodies for IF	Gene function
GUSB	Hs99999908_m1		Housekeeping gene
18S	Hs99999901_s1		Housekeeping gene
ABL1	Hs00245445_m1		Housekeeping gene
AXIN1	Hs00394718_m1		Wnt signaling, beta-cateninin-mediated signaling
BCL2L11	Hs00708019_s1		BCL-2 family members, initiator of apoptosis
BMI1	Hs00180411_m1		Repressive activity of many genes, including Hox genes,chromatin remodelling
BMP4	Hs00370078_m1		Resoderm induction
CD44	Hs01075861_m1		Lymphocyte activation, recirculation and homing, and in hematopoiesis
CDKN1A	Hs00355782_m1		Interactor of p53/TP53, regulates proliferation in response to DNA damage
CDKN2A	Hs00923894_m1		Interactor of p53/TP53, regulates proliferation in response to DNA damage
CDKN2C	Hs00176227_m1		Controls cell cycle G1 progression, regulate spermatogenesis
COQ7	Hs01029186_m1		Regulation of metabolism, lifespan determination
CSF2RB	Hs00166144_m1		Cell differentiation
CTNNB1	Hs00355049_m1		Wnt pathway. Stem cell maintenance and proliferation
CXCL12	Hs00171022_m1	SDF-1 (P-159X) : sc-74271	Embryogenesis, immune surveillance, inflammation response, tissue homeostasis
CXCR4	Hs00607978_s1		Leukocyte trafficking, regulation of innate and adaptive immunity
DHH	Hs00368306_m1		Morphogenesis and gonadal development
DLL1	Hs00194509_m1		Differentiation of progenitor cells into the B-cell lineage, emergence of T cell NK cell precursors
DLL3	Hs01085096_m1		Inhibitor of primary neurogenesis
DLL4	Hs00184092_m1		Angiogenesis; inhibitor of endothelial cell proliferation and migration
DPPA2	Hs00414521_g1	DPPA2 (D-17): sc-69392	Maintenance of stem cell pluripotency
DPPA3	Hs01931905_g1		Maintenance of stem cell pluripotency
DPPA4	Hs00216968_m1		Maintenance of stem cell pluripotency
ERCC1	Hs01012158_m1		DNA repair
FGF4	Hs00173564_m1		Embryonic development, cell growth, tissue repair, morphogenesis
FLT3	Hs00174690_m1		Apoptosis, proliferation, and differentiation of hematopoietic cells
FOS	Hs00170630_m1		Cell proliferation, differentiation, and transformation
GDF3	Hs00220998_m1		Cell growth and differentiation in both embryonic and adult tissues
GFI1	Hs00382207_m1		Cell cycle regulator, hematopoietic differentiation
GLI1	Hs00171790_m1		Stem cell proliferation
GLI2	Hs01119974_m1		Embryogenesis
GSK3A	Hs00997938_m1		Cell division, proliferation, motility and survival

HES1	Hs00172878_m1		Regulator of myogenesis
HIF1A	Hs00936371_m1		Regulator of cellular and systemic homeostatic response to hypoxia
HOXA5	Hs00430330_m1		Expression, morphogenesis, and differentiation
HOXA7	Hs00600844_m1		Cell development
HOXA9	Hs00365956_m1		Cell development
HOXB3	Hs00231127_m1	HoxB3 (H-50): sc-28606	Cell development
HOXB4	Hs00256884_m1	HoxB4 (A-15): sc-28607	Stem cell expansion
HOXB5	Hs00357820_m1		Lung and gut development
HOXB7	Hs00270131_m1		Cell proliferation and differentiation
IHH	Hs01081801_m1		Cell growth, patterning and morphogenesis
IL3	Hs00174117_m1		Cell differentiation
IL3RA	Hs00608141_m1		IL3 signaling, activation of STAT pathway
ITGA4	Hs00168433_m1		Cell growth, division, survival, differentiation, migration and apoptosis
ITGB1	Hs00559595_m1		Cell growth, division, survival, differentiation, migration and apoptosis
JAG1	Hs01070032_m1		Notch signaling, cell-fate decisions during hematopoiesis
JAG2	Hs00171432_m1		Embryonic development
KDM5B	Hs00366783_m1		DNA demethylation
KIT	Hs00174029_m1		Regulation of cell survival and proliferation, hematopoiesis, stem cell maintenance
KITLG	Hs00241497_m1		Cell survival and proliferation, hematopoiesis, stem cell maintenance
KLF10	Hs00921811_m1		Regulation of cell growth
KLF2	Hs00360439_g1		T-cell trafficking
KLF4	Hs00358836_m1		Embryonic stem cells maintenance
LIF	Hs00171455_m1		Hematopoietic differentiation
LIG4	Hs00172455_m1		DNA repair
LIN28	Hs00702808_s1	Lin28 (6D1F9): sc-293120	Maintenance of ES cells
MCL1	Hs00766187_m1		Regulation of apoptosis
MCL1	Hs03043899_m1		Regulation of apoptosis
MSH2 DNA	Hs00953523_m1		Mismatch repair system
MYC	Hs00905030_m1		Cell cycle progression, apoptosis and cellular transformation
NANOG	Hs02387400_g1	Nanog (H-2): sc-374103	Early embryogenesis
NES	Hs00707120_s1	Nestin (5C93): sc-71665	Regulation of differentiation, proliferation and apoptosis, lymphoid maturation
NOTCH1	Hs01062014_m1		Regulation of differentiation, proliferation and apoptosis
NOTCH2	Hs01050719_m1		Regulation of differentiation, proliferation and apoptosis
NOTCH3	Hs01128541_m1		Regulation of differentiation, proliferation and apoptosis
NOTCH4	Hs00965889_m1		Regulation of differentiation, proliferation and apoptosis

PCGF2	Hs00810639_m1		Negative regulation of the self-renewal activity of hematopoietic stem cells
PIWIL1	Hs01041737_m1		Stem cell self-renewal, RNA silencing
POU5F1	PHs00999634_Gh	Oct4 (C-10): sc-5279	Early embryogenesis and embryonic stem cell pluripotency
PTEN	Hs02621230_s1	PTEN (B-1): sc-133197	Antagonizes the PI3K-AKT/PKB signaling pathway, neurogenesis
RAD50	Hs00990023_m1		DNA repair
RB1	Hs00153108_m1		Regulator of entry into cell division
RUNX1	Hs01021970_m1		Development of normal hematopoiesis
SHH	Hs00179843_m1		Hedgehog pathway, embryogenesis, stem cell proliferation
SIRT1-	Hs01009006_m1		Ageing
SMAD5	Hs00195437_m1		Inhibition of proliferation of hematopoietic progenitor cells
SMAD7	Hs00998193_m1		Regulator of TGFb signaling, regulator cell cycle arrest in hematopoietic cells
SMARCC1	Hs00268265_m1		Chromatin remodeling, neural development
SMO	Hs01090242_m1		Hedgehog pathway, embryogenesis, stem cell proliferation
SOX1	Hs01057642_s1	Sox-1 (L-20): sc-17317	Embryonic development and in the determination of the cell fate
SOX2	Hs01053049_s1	Sox-2 Ab (S-15): sc-54517	Early embryogenesis and for embryonic stem cell pluripotency
SPI1	Hs02786711_m1		Myeloid and B-lymphoid cell development
STAT3	Hs01047580_m1		Transcription factor, signal transducer , regulators of cell growth and apoptosis
STAT5A	Hs00234181_m1		Transcription factor, signal transducer , regulators of cell growth and apoptosis
TCF3	Hs01012685_m1		Transcription factor regulating B and T lymphocyte development
TGFB1	Hs00998133_m1		Proliferation, differentiation, adhesion, migration
TGFB2	Hs00234244_m1		Proliferation, differentiation, adhesion, migration
TGFBR1	Hs00610318_m1		Regulator of TGFb signaling, regulator cell cycle arrest in hematopoietic cells
TLE1	Hs00270768_m1		Transcriptional corepressor, regulator of Wnt signal
TRIM27	Hs00179059_m1		Enhancer of polycomb protein and repressor of gene transcription, differentiation of germ cells
VPS72	Hs00195618_m1		DNA repair, acethylation, apoptosis, regulation of long term hematopoiesis
XRCC5	Hs00221707_m1		DNA repair
XRCC6	Hs00995282_g1		DNA repair

Table S3. Enrichment analysis performed in KEGG, using the online tool WebGestalt, of the following groups: UCB vs Adult HSC (Panel A), UCB vs UCBT (Panel B), Adult HSC vs Adult and Pediatric HSCT (Panel C), and Adult UCBT vs Adult and Pediatric HSCT (Panel D).

Panel 1A

KEGG Pathway	#Gene	Gene Symbol	AdjP
Basal cell carcinoma	3	GLI2, GLI1, SHH	1.17e-07
`Hedgehog signaling pathway	3	GLI2, GLI1, SHH	1.24e-07
Pathways in cancer	3	GLI2, GLI1, SHH	2.53e-05

Panel 1B

KEGG Pathway	#Gene	Gene Symbol	AdjP
Pathways in cancer	12	GLI2, HIF1A, PTEN, FGF4, ITGB1, KITLG, CDKN1A, RUNX1, KIT, STAT3, CDKN2A, GLI1,	8.62e-14
Notch signaling pathway	7	HES1, NOTCH1, NOTCH3, DLL3, JAG2, DLL4, DLL1	2.55e-12
Cytokine-cytokine receptor interaction	6	KITLG, LIF, IL3, CXCL12, CXCR4, KIT	1.38e-05
Melanoma	4	CDKN1A, PTEN, FGF4, CDKN2A	2.79e-05
Dorso-ventral axis formation	3	NOTCH1, NOTCH2, PIWIL1	5.22e-05
Hematopoietic cell lineage	4	KITLG, IL3, CD44, KIT	6.59e-05
Acute myeloid leukemia	3	RUNX1, KIT, STAT3	0.0007
Glioma	3	CDKN1A, PTEN, CDKN2A	0.0011

P53 signaling pathway	**3**	**CDKN1A, PTEN, CDKN2A**	**0.0012**
Chronic myeloid leukemia	**3**	**RUNX1, CDKN1A, CDKN2A**	**0.0015**
Leukocyte transendothelial migration	**3**	**CXCL12, CXCR4, ITGB1**	**0.0060**
Axon guidance	**3**	**CXCL12, CXCR4, ITGB1**	**0.0075**
Cell cycle	**3**	**CDKN2C, CDN1A, CDN2A**	**0.0075**
Jak-STAT signaling pathway	**3**	**LIF, IL3, STAT3**	**0.0135**
Chemokine signaling pathway	**3**	**CXCL12, CXCR4, STAT3**	**0.0255**

Panel 1C

KEGG Pathway	#Gene	Gene Symbol	AdjP
Pathways in cancer	**16**	TGFB1, GLI2, CTNNB1, FGF4, MYC, SHH, ITGB1, SMO, KITLG, STAT5A, TGFBR1, BMP4, CDKN1A, FOS, KIT, CDKN2A	**3.16e-19**
Notch signaling pathway	**9**	HES1, DLL3, JAG1, DLL4, DLL1, NOTCH4, JAG2, NOTCH2, NOTCH3	**4.32e-16**
Chronic myeloid leukemia	**6**	TGFB1, STST5A, TGFBR1, CDKN1A, MYC, CDKN2A	**2.65e-08**
Cytokine-cytokine receptor interaction	**8**	TGFB1, CSF2RB, CXCR4, KITLG, TGFBR1, CXCL12, KIT, IL3RA	**1.10e-07**
Basal cell carcinoma	**5**	BMP4, GLI2, CTNNB1, SHH, SMO	**4.27e-07**
Hedgehog signaling pathway	**5**	BMP4, GLI2, IHH, SHH, SMO	**4.67e-07**
Colorectal cancer	**5**	TGFB1, TGFBR1, CTNNB1, FOS, MYC	**7.86e-07**
Dorso-ventral axis formation	**4**	NOTCH3, NOTCH2, PIWIL1, NOTCH4	**1.02e-06**
TGF-beta signaling pathway	5	TGFB1, TGFBR1, BMP4, MYC, SMAD7	**3.67e-06**
Cell cycle	**5**	TGFB1, CDKN2C, CDKN1A, MYC, CDKN2A	**2.56e-05**
Hematopoietic cell lineage	**4**	KILG, CD44, KIT, IL3RA	**0.0002**
Endocytosis	**5**	TGFB1, TGFBR1, CXCR4, KIT, SMAD7	**0.0003**
Leukocyte transendothelial migration	**4**	CXCR4, CXCL12, CTNNB1, ITGB1	**0.0006**

Bladder cancer	**3**	CDKN1A, MYC, CDK2A	**0.0008**
MAPK signaling pathway	**5**	**TGFB1, TGFBR1, FOS, FGF4, MYC**	**0.0011**
Intestinal immune network for IgA production	**3**	**TGFB1, CXCR4, CXCL12**	**0.0012**
Jak-STAT signaling pathway	**4**	**CSF2RB, STAT5A, IL3RA, MYC**	**0.0019**
Acute myeloid leukemia	**3**	**STAT5A, KIT, MYC**	**0.0020**
Melanoma	**3**	**CDKN1A, FGF4, CDKN2A**	**0.0027**
Leishmaniasis	**3**	**TGFB1, FOS, ITGB1**	**0.0027**
Pancreatic cancer	**3**	**TGFB1, TGFBR1, CDKN2A**	**0.0027**
ErbB signaling pathway	**3**	**STAT5A, CDKN1A, MYC**	**0.0081**
Rheumatoid arthritis	**3**	**TGFB1, CXCL12, FOS**	**0.0081**
Chagas disease	**3**	**TGFB1, TGFBR1, FOS**	**0.0108**
Melanogenesis	**3**	**KITLG, CTNNB1, KIT**	**0.0108**
Osteoclast differentiation	**3**	**TGFB1, TGFBR1, FOS**	**0.0216**
Axon guidance	**3**	**CXCR4, CXCL12, ITGB1**	**0.0216**

Panel 1D

KEGG Pathway	**#Gene**	**Gene Symbol**	**AdjP**
Pathways in cancer	**13**	**TGFB1, GLI2, PTEN, HIF1A, FGF4, SHH, SMO, KITLG,TGFBR1, TGFB2, SPI1, FOS, GLI1**	**1.14e-15**
Cytokine-cytokine receptor interaction	**9**	**CSF2RB, LIF, IL3, TGFB1, CXCR4, KITLG, TGFBR1, CXCL12, TGFB2**	**4.38e-10**
Hedgehog signaling pathway	**6**	**DHH, GLI2, GLI1, IHH, SHH, SMO**	**1.11e-09**
Notch signaling pathway	**4**	**HES1, DLL3, NOTCH2, NOTCH4**	**5.50e-06**
Osteoclast differentiation	**5**	**TGFB1, TGFBR1, TGFB2, SPI1, FOS**	**8.10e-06**
Basal cell carcinoma	**4**	**GLI2, GLI1, SHH, SMO**	**1.04e-05**
Colorectal cancer	**4**	**TGFB1, TGFBR1, TGFB2, FOS**	**1.70e-05**
Dorso-ventral axis formation	**3**	**NOTCH2, PIWIL1, NOTCH4**	**5.84e-05**

Rheumatoid arthritis	**4**	**TGFB1, CXCL12, TGFB2, FOS**	**7.94e-05**
Chagas disease	**4**	**TGFB1, TGFBR1, TGFB2, FOS**	**0.0001**
MAPK signaling pathway	**5**	**TGFB1, TGFBR1, TGFB2, FOS, FGF4**	**0.0003**
Intestinal immune network for IgA production	**3**	**TGFB1, CXCL12, CXCR4**	**0.0005**
Renal cell carcinoma	**3**	**TGFB1, TGFB2, HIF1A**	**0.0015**
Pancreatic cancer	**3**	**TGFB1, TGFBR1, TGFB2**	**0.0015**
Chronic myeloid leukemia	**3**	**TGFB1, TGFBR1, TGFB2**	**0.0017**
Leishmaniasis	**3**	**TGFB1, TGFB2, FOS**	**0.0017**
Endocytosis	**4**	**TGFB1, TGFBR1, CXCR4, TGFB2**	**0.0018**
TGF-beta signaling pathway	**3**	**TGFB1, TGFBR1, TGFB2**	**0.0020**
Jak-STAT signaling pathway	**3**	**CSF2RB, LIF, IL3**	**0.0160**
Chemokine signaling pathway	**3**	**CXCL12, CXCR4, GSK3A**	**0.0280**

Tables Legend

Table S1: Clinical characteristics of the patients and donors. Abbreviations: ALL, acute lymphoid leukemia; THAL, thalassemia; AML, acute myeloid leukemia; MDS, myelodysplastic syndrome; FA, Fanconi anemia; CML, chronic myeloid leukemia; SAA, severe anaplastic anemia.

Table S2: list of genes evaluated in the expression analysis. First column: gene symbols; second column: identification codes of commercial assays used for RT-PCR experiments; third column: identification codes of antibodies uses for immunofluorescences; fourth column: gene function.

Table S3: Enrichment analysis performed in KEGG, using the online tool WebGestalt, of the following groups: umbilical cord blood unit (UCB) vs. Adult hematopoietic stem cells HSC (Panel A), UCB vs. patients after UCB transplant (UCBT) (Panel B), Adult HSC vs. Adult and Pediatric patients after HSC transplant (HSCT) (Panel C), and UCBT vs. Adult and Pediatric HSCT (Panel D). "#Gene" indicated the number of genes involved in the cited pathway among the selected 91; "AdjP" is the p value adjusted by the multiple test adjustment.