Table S1. Class Assignment of Acute Myelogenous Leukemia (AML) and Acute Lymphoblastic Leukemia0 (ALL). k =2 and 3.

Samples	k =2 NMF	k =3 NMF	k =2 SNMF	k =3 SNMF
ALL_19769_B-cell	1	1	1	1
ALL_23953_B-cell	1	1	1	1
ALL_28373_B-cell	1	1	1	1
ALL_9335_B-cell	1	1	1	1
ALL_9692_B-cell	1	1	1	1
ALL_14749_B-cell	2	2	1	1
ALL_17281_B-cell	1	1	1	1
ALL_19183_B-cell	1	1	1	1
ALL_20414_B-cell	1	1	1	1
ALL_21302_B-cell	1	3	1	1
ALL_549_B-cell	1	1	1	1
ALL_17929_B-cell	1	1	1	1
ALL_20185_B-cell	1	1	1	1
ALL_11103_B-cell	1	1	1	1
ALL_18239_B-cell	1	1	1	1
ALL_5982_B-cell	1	1	1	1
ALL_7092_B-cell	2	1	1	1
ALL_R11_B-cell	1	1	1	1
ALL_R23_B-cell	1	1	1	1
ALL_16415_T-cell	1	3	1	2
ALL_19881_T-cell	1	3	1	2
ALL_9186_T-cell	1	3	1	2
ALL_9723_T-cell	1	3	1	2
ALL_17269_T-cell	1	3	1	2
ALL_14402_T-cell	1	3	1	2
ALL_17638_T-cell	1	3	1	2
ALL_22474_T-cell	1	3	1	2
AML_12	2	2	2	3
AML_13	2	2	1	1
AML_14	2	2	2	3
AML_16	2	2	2	3
AML_20	2	2	2	3
AML_1	2	2	2	3
AML_2	2	2	2	3
AML_3	2	2	2	3
AML_5	2	2	2	3
AML_6	2	2	2	3
AML_7	2	2	2	3

Table S2. Class Assignment of Central Nervous System Tumors. k=4.

samples	type	NMF k =4	SNMF k =4
Brain_MD_12	medulloblastoma	3	1
Brain_MD_61	medulloblastoma	3	1
Brain_MD_15	medulloblastoma	3	1
Brain_MD_57	medulloblastoma	3	1
Brain_MD_33	medulloblastoma	3	1
Brain_MD_64	medulloblastoma	3	1
Brain_MD_17	medulloblastoma	3	1
Brain_MD_62	medulloblastoma	3	1
Brain_MD_63	medulloblastoma	3	1
Brain_MD_32	medulloblastoma	3	1
Brain_MGlio_1	malignant glioma	4	2
Brain_MGlio_2	malignant glioma	4	2
Brain_MGlio_3	malignant glioma	4	2
Brain_MGlio_4	malignant glioma	4	2
Brain_MGlio_5	malignant glioma	4	2
Brain_MGlio_6	malignant glioma	4	2
Brain_MGlio_7	malignant glioma	4	2
Brain_MGlio_8	malignant glioma	1	3
Brain_MGlio_9	malignant glioma	4	2
Brain_MGlio_10	malignant glioma	4	2
Brain_Rhab_1	rhabdoid	1	3
Brain_Rhab_2	rhabdoid	1	3
Brain_Rhab_3	rhabdoid	1	3
Brain_Rhab_4	rhabdoid	1	3
Brain_Rhab_5	rhabdoid	1	3
Brain_Rhab_6	rhabdoid	1	3
Brain_Rhab_7	rhabdoid	1	3
Brain_Rhab_8	rhabdoid	1	3
Brain_Rhab_9	rhabdoid	1	3
Brain_Rhab_10	rhabdoid	2	3
Brain_Ncer_1	normal	2	4
Brain_Ncer_2	normal	2	4
Brain_Ncer_3	normal	2	4
Brain_Ncer_4	normal	2	4

Table S3. Class Assignment of Medulloblastoma. *k*=4.

Samples	Type	NMF *k*=4	SNMF *k*=4
Brain_MD_7	Classic	3	1
Brain_MD_59		1	2
Brain_MD_20		4	1
Brain_MD_21		5	3
Brain_MD_50		4	1
Brain_MD_49		2	4
Brain_MD_45		4	1
Brain_MD_43		4	1
Brain_MD_8		4	1
Brain_MD_42		3	4
Brain_MD_1		5	4
Brain_MD_4		3	4
Brain_MD_55		3	4
Brain_MD_41		4	1
Brain_MD_37		1	1
Brain_MD_3		3	4
Brain_MD_34		5	4
Brain_MD_29		4	1
Brain_MD_13		3	4
Brain_MD_24		3	4
Brain_MD_65		4	1
Brain_MD_5		1	2
Brain_MD_66		1	2
Brain_MD_67		1	1
Brain_MD_58		3	4
Brain_MD_53	Desmoplastic	2	4
Brain_MD_56		2	5
Brain_MD_16		2	4
Brain_MD_40		2	2
Brain_MD_35		2	5
Brain_MD_30		2	4
Brain_MD_23		2	5
Brain_MD_28		5	3
Brain_MD_60		1	2

Table S4. The twenty genes that tend to be co-expressed in each leukemia subtype.

subtypes	Gene Names
ALL-B	"Putative polymerase
	AP-3 complex beta3A subunit mRNA
	PI5 Protease inhibitor 5 (maspin)
	XP-C repair complementing protein (p58/HHR23B)
	CD30L protein
	"Unknown gene extracted from Human HLA class III region containing NOTCH4 gene, partial sequence.
	KIAA0013 gene
	TAFII20 mRNA for transcription factor TFIID
	"Autoantigen DFS70 mRNA, partial cds"
	Histone H2b gene
	Af-17
	mRNA PCTAIRE-2 for serine/threonine protein kinase
	"LIPA Lipase A, lysosomal acid, cholesterol esterase"
	"Major Histocompatibility Complex, Class I, E (Gb:M21533)"
	HMG2 High-mobility group (nonhistone chromosomal) protein 2
	Activin beta-A subunit (exon 2)
	"Indian hedgehog protein (IHH) mRNA, 5' end"
	Myosin VIIA (USH1B) mRNA
	ROS1 Transmembrane tyrosine-specific protein kinase ROS1
ALL-T	AMPH Amphiphysin (128kD autoantigen)
	SKI V-ski avian sarcoma viral oncogene homolog
	Thiol-specific antioxidant protein mRNA
	PI5 Protease inhibitor 5 (maspin)
	CKB Creatine kinase B
	Proto-Oncogene Trk
	"Retinoblastoma susceptibility protein (RB1) gene
	"Axonemal dynein heavy chain (partial, ID hdhc3)"
	G-protein coupled receptor
	AFFX-BioDn-5_st (endogenous control)
	KRT13 Keratin 13
	AGTR1 Angiotensin receptor 1
	Homeotic Protein Hpx-42
	"(clone Z146) retinal mRNA, 3' end and repeat region"
	AP-3 complex beta3A subunit mRNA
	APLP2 Amyloid beta (A4) precursor-like protein 2
	"ATP-binding cassette protein mRNA 06B09 clone, partial cds"
	HGF Hepatocyte growth factor (hepapoietin A; scatter factor)
	"PFKP Phosphofructokinase, platelet"
	"MUC1 Mucin 1, transmembrane"
AML	"Indian hedgehog protein (IHH) mRNA, 5' end"
	CD202 protein
	GRO3 GRO3 oncogene

	"Unknown gene extracted from Human HLA class III region containing NOTCH4 gene, partial sequence,
	AGTR1 Angiotensin receptor 1
	EWSR1 Ewing sarcoma breakpoint region 1
	Histone H2B.1 (H2B) gene
	Rab28 mRNA
	EDNRB Endothelin receptor type B
	"Putative polymerase
	XP-C repair complementing protein (p58/HHR23B)
	ASM-like phosphodiesterase 3a
	Lysyl oxidase-related protein (WS9-14) mRNA
	AP-3 complex beta3A subunit mRNA
	(clone hEHK1-L) EHK1 receptor tyrosine kinase ligand (EFL-2) mRNA
	PROTEIN PHOSPHATASE INHIBITOR 2
	"Alpha(1,3)fucosyltransferase mRNA"
	CD30L protein
	ITBA2 protein
	Cellular oncogene c-fos (complete sequence)