

Table S3. Node marker panel for brain cancer and normal transcriptome classification.

Node #	Node phenotype classes	Gene <i>i</i>				Gene <i>j</i>				<i>k</i>
		Gene symbol	Gene name	Chromosome locus	Affymetrix Probe ID	Gene symbol	Gene name	Chromosome locus	Affymetrix Probe ID	
2	EPN GBM MDL MNG OLG PA	<i>PRPF40A</i>	PRP40 pre-mRNA processing factor 40 homolog A (S. cerevisiae)	2q23.3	218053_at	<i>PURA</i>	Purine-rich element binding protein A	5q31	204021_s_at	1
3	normal	<i>PURA</i>	Purine-rich element binding protein A	5q31	204021_s_at	<i>PRPF40A</i>	PRP40 pre-mRNA processing factor 40 homolog A (S. cerevisiae)	2q23.3	218053_at	1
4	EPN GBM MDL OLG PA	<i>NRCAM</i>	Neuronal cell adhesion molecule	7q31	204105_s_at	<i>ISLR</i>	Immunoglobulin superfamily containing leucine-rich repeat	15q23-q24	207191_s_at	1
		<i>IDH2</i>	Isocitrate dehydrogenase 2 (NADP+), mitochondrial	15q26.1	210046_s_at	<i>GMDS</i>	GDP-mannose 4,6-dehydratase	6p25	214106_s_at	
5	MNG	<i>ISLR</i>	Immunoglobulin superfamily containing leucine-rich repeat	15q23-q24	207191_s_at	<i>NRCAM</i>	Neuronal cell adhesion molecule	7q31	204105_s_at	1
6	EPN GBM OLG PA	<i>SALL1</i>	Sal-like 1 (Drosophila)	16q12.1	206893_at	<i>PAFAH1B3</i>	Platelet-activating factor acetylhydrolase 1b, catalytic subunit 3	19q13.1	203228_at	2
		<i>SRI</i>	Sorcin	7q21	208920_at	<i>NBEA</i>	Neurobeachin	13q13	221207_s_at	
		<i>DDR1</i>	Discoidin domain receptor tyrosine kinase 1	6p21.3	210749_x_at	<i>TIA1</i>	TIA1 cytotoxic granule-associated RNA binding protein	2p13	201447_at	
		<i>DDR1</i>	Discoidin domain receptor tyrosine kinase 1	6p21.3	208779_x_at	<i>MAB21L1</i>	Mab-21-like 1 (C. elegans)	13q13	206163_at	
		<i>ITPKB</i>	Inositol 1,4,5-trisphosphate 3-kinase B	1q42.13	203723_at	<i>PDS5B</i>	PDS5, regulator of cohesion maintenance, homolog B (S. cerevisiae)	13q12.3	204742_s_at	
7	MDL	<i>PAFAH1B3</i>	Platelet-activating factor acetylhydrolase 1b, catalytic subunit 3	19q13.1	203228_at	<i>SALL1</i>	Sal-like 1 (Drosophila)	16q12.1	206893_at	4
		<i>NBEA</i>	Neurobeachin	13q13	221207_s_at	<i>SRI</i>	Sorcin	7q21	208920_at	
		<i>TIA1</i>	TIA1 cytotoxic granule-associated RNA binding protein	2p13	201447_at	<i>DDR1</i>	Discoidin domain receptor tyrosine kinase 1	6p21.3	210749_x_at	
		<i>MAB21L1</i>	Mab-21-like 1 (C. elegans)	13q13	206163_at	<i>DDR1</i>	Discoidin domain receptor tyrosine kinase 1	6p21.3	208779_x_at	
		<i>PDS5B</i>	PDS5, regulator of cohesion maintenance, homolog B (S. cerevisiae)	13q12.3	204742_s_at	<i>ITPKB</i>	Inositol 1,4,5-trisphosphate 3-kinase B	1q42.13	203723_at	
8	EPN	<i>NUP62CL</i>	Nucleoporin 62kDa C-terminal like	Xq22.3	220520_s_at	<i>ZNF280A</i>	Zinc finger protein 280A	22q11.22	216034_at	2
		<i>GALNS</i>	Galactosamine (N-acetyl)-6-sulfate sulfatase	16q24.3	206335_at	<i>WAS</i>	Wiskott-Aldrich syndrome (eczema-thrombocytopenia)	Xp11.4-p11.21	38964_r_at	
		<i>CELSR1</i>	Cadherin, EGF LAG seven-pass G-type receptor 1 (flamingo homolog, Drosophila)	22q13.3	41660_at	<i>OR10H3</i>	Olfactory receptor, family 10, subfamily H, member 3	19p13.1	208520_at	
		<i>TLE4</i>	Transducin-like enhancer of split 4 (E(sp1) homolog, Drosophila)	9q21.31	216997_x_at	<i>OLIG2</i>	Oligodendrocyte lineage transcription factor 2	21q22.11	213824_at	

Table S3. (Continued) Node marker panel for brain cancer and normal transcriptome classification.

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		Gene symbol	Gene name	Chromosome locus	Affymetrix Probe ID	Gene symbol	Gene name	Chromosome locus	Affymetrix Probe ID	
9	GBM OLG PA	<i>ZNF280A</i>	Zinc finger protein 280A	22q11.22	216034_at	<i>NUP62CL</i>	Nucleoporin 62kDa C-terminal like	Xq22.3	220520_s_at	1
10	GBM OLG	<i>DDX27</i>	DEAD (Asp-Glu-Ala-Asp) box polypeptide 27	20q13.13	215693_x_at	<i>KCNMA1</i>	Potassium large conductance calcium-activated channel, subfamily M, alpha member 1	10q22.3	221584_s_at	1
		<i>COX7A2</i>	Cytochrome c oxidase subunit VIIa polypeptide 2 (liver)	6q12	217249_x_at	<i>GNPTAB</i>	N-acetylglucosamine-1-phosphate transferase, alpha and beta subunits	12q23.2	212959_s_at	
11	PA	<i>KCNMA1</i>	Potassium large conductance calcium-activated channel, subfamily M, alpha member 1	10q22.3	221584_s_at	<i>DDX27</i>	DEAD (Asp-Glu-Ala-Asp) box polypeptide 27	20q13.13	215693_x_at	3
		<i>GNPTAB</i>	N-acetylglucosamine-1-phosphate transferase, alpha and beta subunits	12q23.2	212959_s_at	<i>NDUFS2</i>	NADH dehydrogenase (ubiquinone) Fe-S protein 2, 49kDa (NADH-coenzyme Q reductase)	1q23	201966_at	
		<i>APOD</i>	Apolipoprotein D	3q26.2-qter	201525_at	<i>PPIA</i>	Peptidylprolyl isomerase A (cyclophilin A)	7p13	211378_x_at	
		<i>CD59</i>	CD59 molecule, complement regulatory protein	11p13	212463_at	<i>SNRPB2</i>	Small nuclear ribonucleoprotein polypeptide B	20p12.1	202505_at	
		<i>SEMA3E</i>	Sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3E	7q21.11	206941_x_at	<i>ADAMTS3</i>	ADAM metalloproteinase with thrombospondin type 1 motif, 3	4q13.3	214913_at	
		<i>CD59</i>	CD59 molecule, complement regulatory protein	11p13	200985_s_at	<i>HINT1</i>	Histidine triad nucleotide binding protein 1	5q31.2	208826_x_at	
12	GBM	<i>BAMBI</i>	BMP and activin membrane-bound inhibitor homolog (<i>Xenopus laevis</i>)	10p12.13-p11.2	203304_at	<i>CIAPIN1</i>	Cytokine induced apoptosis inhibitor 1	16q13-q21	208968_s_at	1
		<i>FLNA</i>	Filamin A, alpha	Xq28	214752_x_at	<i>TNKS2</i>	Tankyrase, TRF1-interacting ankyrin-related ADP-ribose polymerase 2	10q23.3	218228_s_at	
		<i>ITGB3BP</i>	Integrin beta 3 binding protein (beta3-endonexin)	1p31.3	205176_s_at	<i>RB1CC1</i>	RB1-inducible coiled-coil 1	8q11	202034_x_at	
13	OLG	<i>DDX27</i>	DEAD (Asp-Glu-Ala-Asp) box polypeptide 27	20q13.13	215693_x_at	<i>TRIM8</i>	Tripartite motif-containing 8	10q24.3	221012_s_at	1
		<i>LARP5</i>	La ribonucleoprotein domain family, member 4B	10p15.3	208953_at	<i>ANXA1</i>	Annexin A1	9q12-q21.2	201012_at	

Node #: Corresponds to numerical labels shown in the brain phenotype diagnostic hierarchy (Fig. 1). **Brain phenotype abbreviation (name):** EPN (Ependymoma), GBM (Glioblastoma multiforme), MDL (Medulloblastoma), MNG (Meningioma), normal (Normal brain), OLG (Oligodendroglioma), and PA (Pilocytic astrocytoma). **Gene *i* / Gene *j*:** the gene expressed higher and lower in the gene-pair, respectively, within each corresponding phenotype. **Gene name / Chromosome locus:** according to Entrez Gene. **Affymetrix Probe ID:** For both Affymetrix Human Genome U133A and U133Plus2.0 Arrays. ***k*:** The minimum number of gene-pair classifiers whose decision rule outcomes for a test sample are required to be 'true (= 1)' for the sample to be classified as the phenotype(s) of the corresponding node.