

Table S1 Top50 differential expression genes between astrocytoma and GBM ("A" represents Astrocytoma, "G" represents GBM)

Regulation	Ensembl ID	log2 Fold Change	Adj.Pval	Symbol	Chr	Type	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
Up	ENSG00000171540	5.771921	1.66E-09	OTP	5q14.1	protein_coding	6.426277	6.825115	6.811379	4.906306	7.388565	4.260653	8.658824	5.835228	7.526613	7.440927	2.767688	3.767555	2	2.274915	4.327029	2	2	2	2	2.470725	3.289711	2	2.295332	2.292749
Up	ENSG00000188257	5.67735	9.50E-05	PLA2G2A	1p36.13	protein_coding	13.63023	11.02922	11.72424	2	2.885558	12.29303	7.121251	9.241633	4.310706	9.163588	9.38197	4.288247	3.603118	3.304195	4.438155	2	4.560333	8.161433	2	2.825062	5.697232	6.781977	2.295332	2
Up	ENSG00000275385	5.076155	8.88E-07	CCL18	17q12	protein_coding	4.261931	3.174614	3.278085	5.695371	2.509685	2.920106	6.731205	2.624578	3.781442	5.789778	7.256807	2.244865	2	2.505734	2	2.397595	2	2.311362	2.280045	2.470725	2.868367	2.265893	2.295332	2
Up	ENSG00000131668	4.893882	2.07E-06	BARX1	9q22.32	protein_coding	4.538211	2.394329	5.120337	2.831582	7.998316	4.043656	6.487857	5.462386	4.554685	2.799269	2	2.799027	2.327399	2	3.140983	2.397595	2	2	2.716068	2.470725	2.270707	2.265893	2.540359	2.535998
Up	ENSG00000137673	4.737592	6.12E-06	MMP7	11q22.2	protein_coding	7.451936	4.156282	6.349245	5.442994	2.277235	2.532195	7.446278	3.781535	5.687483	8.424225	10.79426	2.944791	2	3.631908	4.075248	2.397595	2.889008	2.311362	5.523237	2.825062	3.40664	2.684495	4.212469	2.925916
Up	ENSG00000146674	4.615296	1.41E-08	IGFBP3	7p12.3	protein_coding	14.36851	12.24219	11.11142	7.22431	11.52642	12.19541	14.04757	11.51804	13.14433	11.98951	11.80288	7.419739	7.392819	5.355664	5.706324	6.668623	9.626268	7.848159	6.214676	3.728936	10.20414	8.26477	4.87984	4.626291
Up	ENSG00000137197	4.552285	2.04E-05	CDSN	CHR_HSCHR6_MHC_COX_C TG1	protein_coding	3.332583	4.514746	6.328927	2	3.98775	5.549306	6.128506	2.858092	4.396699	3.310595	2.767688	5.894687	2	2	2.850833	2	2	2	3.321715	2.254476	2.498555	2.490324	2	2
Up	ENSG00000183072	4.492517	3.93E-11	NKX2-5	5q35.1	protein_coding	7.017164	6.809028	6.720717	3.49526	7.336562	3.356958	8.27438	7.452826	8.385033	8.961353	6.009401	4.583643	2.594069	3.304195	3.589215	4.357561	3.187675	2.567309	3.192445	4.030846	4.358389	2.265893	2.932567	3.364464
Up	ENSG00000106178	4.326043	3.14E-03	CCL24	7q11.23	protein_coding	4.013306	2.394329	2.361806	2	2	2.532195	6.818107	2.858092	2.936693	3.687355	11.08856	2.244865	2.327399	2	2.850833	2.397595	2	2	2.280045	2	2.270707	2	2.295332	2
Up	ENSG00000170454	4.318729	1.02E-05	KRT75	12q13.13	protein_coding	10.80149	6.167831	4.681594	9.195071	2.277235	7.893427	8.631089	4.340048	8.001698	6.981658	4.476772	3.843882	3.476767	4.691085	6.603046	2.708956	2.278551	3.66353	2.514466	3.452134	4.804376	3.008558	2.295332	3.325559
Up	ENSG00000173432	4.295869	1.79E-07	SAA1	11p15.1	protein_coding	12.72355	7.671822	11.4887	4.747887	3.539446	5.342784	6.886729	7.530973	5.00151	6.654235	10.23186	4.901952	5.153355	4.543055	4.438155	4.166848	4.208076	3.959972	5.050313	3.728936	8.797233	4.215007	4.063621	4.459287
Up	ENSG00000174343	4.148618	9.68E-05	CHRNA9	4p14	protein_coding	9.251217	7.430299	5.697264	4.955469	2.277235	6.818327	9.90592	5.351899	9.557639	7.40777	12.24213	3.767555	2.819053	4.737235	5.873834	3.537972	2.889008	4.128393	3.746984	2.658745	7.605201	6.913737	3.806877	2.292749
Up	ENSG00000197587	4.103129	1.40E-06	DMBX1	1p33	protein_coding	8.187395	4.43313	5.255654	2.831582	4.998504	5.729933	7.88915	5.531607	5.965893	4.073003	2.767688	3.414048	2.819053	3.631908	4.206624	2.708956	2	2.567309	2.280045	2.658745	3.61541	2.265893	2.295332	2.74409
Up	ENSG00000163497	4.098435	1.48E-04	FEV	2q35	protein_coding	3.008884	2	3.713815	6.393048	8.031405	2.532195	7.633641	3.992652	3.33546	7.069086	2.767688	3.198415	2.327399	2.274915	3.140983	3.37103	2	3.289995	4.146566	3.346657	2.270707	2	2.295332	2.292749
Up	ENSG00000239839	3.943858	2.92E-02	DEFA3	8p23.1	protein_coding	4.822552	2	2	2	2.277235	2.290499	4.432288	2.858092	2.383731	2	3.038302	2.244865	2.594069	2	2.487251	2	2	2	2	2	2	2	2	2
Up	ENSG00000115457	3.823131	8.35E-09	IGFBP2	2q35	protein_coding	12.51356	11.94883	12.66228	10.34345	12.80782	10.58748	13.54642	13.38554	13.63359	12.7765	13.64244	7.796226	9.357899	5.325771	10.08637	6.455654	8.644342	7.576838	8.279757	8.391427	10.9642	9.091617	6.49703	6.21318
Up	ENSG00000197153	3.809606	1.05E-09	HIST1H3J	6p22.1	protein_coding	7.476746	9.542688	10.21228	11.18445	10.53828	8.259622	7.973604	9.274818	7.564263	9.786891	8.32889	6.952663	5.382074	4.948138	3.930698	5.671347	4.452197	3.42554	4.342107	6.004179	7.965942	5.997845	5.007588	5.812334
Up	ENSG00000167767	3.805729	4.06E-06	KRT80	12q13.13	protein_coding	5.103105	5.147027	3.438401	3.028225	2	5.576537	7.741333	5.531607	6.44098	5.268418	7.088284	4.443492	2.327399	2.879463	3.382437	3.82313	3.64605	2.567309	2.892921	3.550422	2.498555	2	2.295332	2.292749
Up	ENSG00000113924	3.791455	1.63E-06	HGD	3q13.33	protein_coding	8.918434	6.288768	8.371641	4.747887	4.202195	5.063693	7.92222	5.721328	9.156751	6.339544	11.681	5.408584	4.020409	6.083564	5.356247	5.597633	4.799775	4.709336	4.214734	4.541656	6.113159	5.308116	4.68975	4.270389
Up	ENSG00000100985	3.781975	9.78E-04	MMP9	20q13.12	protein_coding	12.32917	11.00736	10.14559	7.662114	10.0029	12.86473	14.42465	9.358164	5.937482	13.17213	10.90306	5.682444	5.450909	6.789738	5.465227	5.106925	4.926425	5.30925	4.892777	6.486213	11.65529	5.51656	5.047774	4.201495
Up	ENSG00000168779	3.70592	1.03E-05	SHOX2	3q25.32	protein_coding	9.841004	9.620795	8.968952	5.806728	7.998316	8.384284	9.647718	8.544887	9.178158	7.229491	7.454666	7.407215	2.327399	4.123918	7.485203	2.964902	3.187675	2.311362	4.40181	3.452134	7.237983	3.008558	4.139963	2.292749
Up	ENSG00000122133	3.700063	1.94E-03	PAEP	9q34.3	protein_coding	2.814974	2	2	3.622475	2.709828	3.5886	7.601335	2.624578	3.33546	4.791138	6.863025	3.767555	2	2.274915	3.140983	2.964902	2	2.311362	2	2.470725	2.498555	2	2.295332	2
Up	ENSG00000163661	3.692964	1.56E-06	PTX3	3q25.32	protein_coding	12.74669	9.237794	9.951601	4.955469	4.38885	8.989036	11.45897	8.754854	8.631065	8.854669	8.147768	5.930133	6.113029	5.496489	6.191891	5.305195	6.333982	5.343889	5.700111	6.409716	8.127988	7.654799	6.117366	5.640805
Up	ENSG00000215644	3.689396	4.54E-05	GCGR	17q25.3	protein_coding	8.352887	3.174614	4.475225	5.372342	2.509685	4.191884	8.993536	5.966016	3.499921	3.572365	2	5.162568	3.338279	3.72646	3.589215	2.708956	3.187675	2.784618	3.440348	3.642438	3.022896	2.855607	3.494333	4.201495
Up	ENSG00000078399	3.672813	1.37E-03	HOXA9	7p15.2	protein_coding	2.814974	2.958281	2.361806	5.003012	2.277235	4.191884	6.433843	4.798954	2	3.893027	4.057079	4.443492	2	2.274915	2.850833	2	2	2	2	2.254476	3.709461	2.265893	2	2.292749
Up	ENSG00000164651	3.654028	2.67E-04	SP8	7p21.1	protein_coding	8.921449	5.728892	7.228215	4.802649	2	5.777644	7.437155	6.502737	10.10933	3.159435	2	6.678218	4.830656	2.505734	4.637616	4.444228	2	5.273759	3.746984	2.974172	4.172737	5.337297	3.373047	3.364464
Up	ENSG00000181649	3.637655	3.97E-07	PHLDA2	11p15.4	protein_coding	6.83727	6.192843	6.287413	4.042133	9.322958	5.629502	8.56562	6.413864	6.399923	6.303943	9.441489	4.174616	3.185071	3.176026	4.727876	4.265354	4.273087	3.66353	4.279825	3.346657	5.828786	4.978364	3.494333	2.292749
Up	ENSG00000166407	3.614048	2.13E-06	LMO1	11p15.4	protein_coding	5.923431	7.783064	9.280662	11.1702	10.42189	6.949093	10.95017	8.553234	9.330682	12.59071	3.929851	6.94402	7.216236	6.065589	4.893039	7.046505	5.150576	7.754708	6.093177	7.440906	5.144561	4.902297	6.117366	7.509206
Up	ENSG00000172789	3.581079	4.26E-05	HOXC5	12q13.13	protein_coding	4.658751	3.936961	6.465485	6.848347	6.688671	4.943342	7.177117	6.919102	3.903967	5.027765	6.24144	3.601602	2	3.304195	4.54133	2	2	2	2.280045	3.452134	3.61541	4.44688	2.74975	2
Up	ENSG00000276368	3.57488	3.92E-08	HIST1H2AJ	6p22.1	protein_coding	8.646893	10.83833	11.3855	12.37469	11.38546	8.808458	8.939643	11.74084	8.530033	11.37448	10.12337	8.253378	6.27366	4.986856	9.104359	7.694034	5.344538	3.140381	7.183821	8.134469	7.937072	6.998382	6.243838	6.24776
Up	ENSG00000123364	3.55023	4.13E-04	HOXC13	12q13.13	protein_coding	2.325488	5.040826	2.891498	3.84751	2.885558	5.974731	6.60654	4.854042	2.383731	3.310595	4.648246	3.843882	2	2	7.573054	2.397595	2.278551	2	2.280045	2	2.270707	3.938594	2.295332	2.535998
Up	ENSG00000273983	3.548979	4.87E-05	HIST1H3G	6p22.2	protein_coding	8.435361	7.521974	10.6097	4.569902	10.82513	8.881241	9.217866	11.30536	7.787609	11.44615	9.12672	7.776887	7.081622	4.052708	4.54133	4.813298	4.70871	2.973438	4.40181	5.584416	9.313803	5.152641	4.68975	2.535998
Up	ENSG00000189120																													

Table S2 Results of CIBERSORT ("A" represents Astrocytoma,"G"represents GBM)

Sample	B cells naive	B cells memory	Plasma cells	T cells CD8	T cells CD4 naive	T cells CD4 memory resting	T cells CD4 memory activated	T cells follicular helper	T cells regulatory (Tregs)	T cells gamma delta	NK cells resting	NK cells activated	Monocytes	Macrophages M0	Macrophages M1	Macrophages M2	Dendritic cells resting	Dendritic cells activated	Mast cells resting	Mast cells activated	Eosinophils	Neutrophils	P-value	Pearson Correlation	RMSE
G1	0	0	0.021255	0	0	0.02982	0	0.05054	0.012248	0	0.048611	0	0.092635	0.325563	0	0	0	0.0006	0	0.123217	0.073848	0.221693	0.01	0.209747	1.053869
G2	0.007126	0	0.069559	0	0	0.131187	0	0.09034	0	0	0.036246	0.073768	0	0.390978	0.002289	0.190703	0	0	0	0.007163	0	0.0006	0.11	0.128375	1.075117
G3	0	0	0.156878	0	0	0.076898	0	0.061154	0	0	0.055414	0.003927	0.03597	0.088267	0.019239	0.36973	0	0	0	0.033466	0.021532	0.077524	0.3	0.073726	1.06218
G4	0	0	0.269493	0.099511	0.004769	0	0	0.137833	0	0	0	0.09237	0	0	0	0.332928	0	0	0	0.059417	0	0.003679	0.97	-0.0331	1.093059
G5	0.078223	0	0.0119	0	0	0.081814	0	0.07348	0.020759	0	0.017863	0.041676	0	0.437857	0	0.157493	0	0	0.047238	0	0	0.031697	0.91	-0.013	1.151704
G6	0	0.009936	0.010334	0	0	0.196722	0	0.052518	0	0	0.069317	0.018052	0.0004	0.311443	0	0.227514	0	0.001555	0	0.08856	0	0.013643	0.02	0.173622	1.045728
G7	0	0	0.010534	0.010315	0.033499	0.012459	0	0.006129	0	0	0.094716	0	0.017828	0.687736	0	0	0	0	0	0.126784	0	0	0	0.55647	0.852898
G8	0	0.009374	0.032023	0	0	0.127675	0	0.127697	0	0	0.081857	0.04766	0.033408	0.206309	0	0.221377	0	0	0.042685	0	0.010044	0.059891	0.33	0.066887	1.072258
G9	0	0	0.017113	0	0	0.093871	0	0.048008	0	0	0	0.099695	0.158153	0	0.054591	0.276039	0	0	0	0.188644	0.015248	0.048638	0.59	0.030044	1.108175
G10	0	0.014283	0.006073	0	0	0.219659	0	0.039851	0.032903	0	0.018197	0.027607	0.018073	0.38912	0	0.163822	0	0	0	0.055848	0	0.014564	0.02	0.184971	1.047569
G11	0	0	0.041072	0.034302	0	0.091885	0	0.071732	0	0	0.011533	0.007397	0.086953	0.190306	0.059727	0.302347	0	0	0	0.057049	0.016003	0.029694	0.08	0.149518	1.042882
G12	0.019951	0	0.115304	0	0	0.093642	0	0.131757	0	0	0.036918	0.047937	0.096332	0.018556	0.010984	0.254536	0	0	0	0.0943	0.064787	0.014995	0.87	-0.0054	1.078999
A1	0.077271	0	0.0724	0	0	0.067586	0	0.162985	0	0	0	0.078885	0.241728	0	0.06472	0.131463	0	0	0	0	0.042562	0.0604	0.93	-0.019	1.09556
A2	0	0	0.157287	0.039707	0	0.133231	0	0.098687	0	0	0	0.084671	0.234276	0	0	0.146869	0	0	0	0.10488	0	0.0004	1	-0.0514	1.10294
A3	0.097393	0	0.193297	0	0	0.029905	0	0.044646	0	0	0	0.046772	0.108984	0.033412	0.003113	0.296911	0	0	0	0.10768	0.02437	0.013517	0.42	0.053568	1.060346
A4	0.076703	0	0.225093	0	0.1588	0	0	0	0	0	0	0.049222	0.159661	0	0.004364	0.230114	0	0	0	0.011737	0.056757	0.02755	1	-0.0583	1.089811
A5	0.138777	0	0.07886	0	0.161954	0.011592	0	0	0	0	0.060017	0.018787	0.066033	0.01976	0	0.262631	0	0	0	0.125723	0.055868	0	0.98	-0.0389	1.094664
A6	0.025796	0	0.074325	0	0	0.049477	0	0.056707	0	0	0	0.046538	0.149874	0	0	0.202911	0	0	0	0.328984	0.043539	0.021848	0.11	0.135149	1.07619
A7	0	0.023976	0.191275	0	0.034441	0.039606	0	0	0	0	0.002927	0.009662	0.074021	0	0	0.326844	0	0	0	0.234234	0.028527	0.034488	0.82	0.002787	1.107107
A8	0	0	0.177623	0	0.041626	0	0	0.061427	0	0	0	0.033461	0.090843	0	0	0.211869	0	0	0	0.331766	0.031828	0.019557	0.43	0.052196	1.109589
A9	0.03469	0	0.119016	0.004411	0	0.047342	0	0.022879	0.015186	0	0	0.016159	0	0.132151	0.014659	0.470202	0	0	0	0.073811	0	0.049494	0.14	0.115237	1.068932
A10	0.00713	0	0.036162	0	0	0.143523	0	0.024153	0	0	0	0.073642	0.127215	0	0.035602	0.230768	0	0.005194	0	0.259674	0.036072	0.020863	0.29	0.080298	1.087846
A11	0	0	0.095038	0	0	0.061789	0	0.039887	0	0.005814	0	0.022868	0.257673	0	0	0.294874	0	0	0	0.130741	0.088312	0.003004	0.08	0.144129	1.041817
A12	0	0	0.365861	0	0.033194	0.005359	0	0	0	0	0	0.024594	0.043115	0	0	0.155775	0	0	0	0.276375	0.093791	0.001936	0.87	-0.0059	1.113863