

## SUPPLEMENTARY DATA

### Independent validation of a mathematical genomic model for survival of glioma patients

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Tables S1-S3

**Table S1.** Subject clinical, demographical, and  $F_1$  score information

Subject ID	Subject No	Group	Gender	Age (yrs)	Tumor Type	Grade	Survival (yrs)	$F_1$ score	Notes
TCGA-DB-A75O	1	LTS	M	29	AS	G3	> 4	22.185	
TCGA-DH-A7UR	2	LTS	F	59	OD	G3	> 6	24.277	
TCGA-DU-A6S6	3	LTS	F	35	OA	G2	> 6	20.617	
TCGA-DU-A7TA	4	LTS	M	32	OD	G2	> 6	16.784	
TCGA-DU-A7TB	5	LTS	M	56	OD	G2	> 4	22.305	
TCGA-DU-A7TI	6	LTS	M	32	AS	G3	3.24	16.333	
TCGA-E1-A7YH	7	LTS	F	47	AS	G3	7.77	17.412	
TCGA-E1-A7YO	8	LTS	M	45	OD	G3	6.25	20.399	
TCGA-E1-A7YW	9	LTS	M	28	OA	G2	3.07	15.175	
TCGA-E1-A7YY	10	LTS	F	27	OD	G2	12.18	29.048	X
TCGA-E1-A7Z3	11	LTS	F	31	AS	G2	6.12	26.156	X
TCGA-E1-A7Z4	12	LTS	M	35	AS	G2	12.09	19.118	
TCGA-HT-7611	13	LTS	M	36	OA	G2	> 6	18.934	
TCGA-R8-A6MK	14	LTS	M	40	OD	G2	> 8	19.872	
TCGA-R8-A6ML	15	LTS	M	52	OD	G3	> 8	17.813	
TCGA-R8-A6MO	16	LTS	F	53	OD	G2	> 4	19.311	
TCGA-S9-A6TS	17	LTS	F	48	AS	G3	5.18	20.214	
TCGA-S9-A6TU	18	LTS	M	38	AS	G2	> 6	17.959	
TCGA-S9-A6U8	19	LTS	M	24	AS	G2	> 8	18.567	
TCGA-S9-A6U9	20	LTS	M	36	AS	G3	> 7	19.317	
TCGA-S9-A6UB	21	LTS	M	52	OD	G2	> 8	20.526	
TCGA-S9-A6WD	22	LTS	M	58	OD	G3	> 5	21.118	
TCGA-S9-A6WE	23	LTS	M	34	OD	G2	> 9	16.163	
TCGA-S9-A6WG	24	LTS	M	31	AS	G3	> 6	21.762	
TCGA-S9-A7R1	25	LTS	M	35	OD	G2	> 14	18.511	
TCGA-S9-A7R3	26	LTS	F	28	AS	G2	> 7	19.653	
TCGA-TM-A7CF	27	LTS	F	41	AS	G2	> 4	19.501	
TCGA-TM-A84F	28	LTS	M	48	AS	G3	> 5	22.473	
TCGA-TM-A84G	29	LTS	F	54	OD	G3	> 4	19.157	
TCGA-TQ-A7RK	30	LTS	M	29	OA	G2	> 4	16.245	
TCGA-TQ-A7RM	31	LTS	F	41	OA	G3	> 4	18.815	
TCGA-TQ-A7RN	32	LTS	M	32	OD	G2	> 4	15.712	
TCGA-TQ-A7RO	33	LTS	M	29	OA	G2	> 4	18.047	
TCGA-W9-A837	34	LTS	M	47	OD	G2	> 4	19.806	
TCGA-WY-A858	35	LTS	F	32	AS	G3	> 4	19.334	
TCGA-WY-A859	36	LTS	F	34	AS	G2	> 4	22.624	
TCGA-WY-A85A	37	LTS	M	20	AS	G2	> 4	15.249	
TCGA-WY-A85B	38	LTS	M	24	AS	G2	> 4	15.554	
TCGA-WY-A85C	39	LTS	M	36	AS	G2	> 4	17.208	

TCGA-WY-A85D	40	LTS	M	60	OA	G2	> 4	19.277	
TCGA-DU-A76K	41	STS	M	87	OD	G2	0.95	27.462	
TCGA-DU-A7TD	42	STS	M	52	OA	G3	0.62	36.625	
TCGA-E1-A7YI	43	STS	F	33	AS	G3	0.3	19.560	X
TCGA-HT-A5RC	44	STS	F	70	AS	G3	0.44	30.711	
TCGA-S9-A6UA	45	STS	M	66	AS	G3	0.49	28.342	
TCGA-S9-A7R2	46	STS	M	69	AS	G3	0.87	29.136	
TCGA-VM-A8CD	47	STS	M	58	AS	G3	0.66	31.159	
TCGA-VW-A8FI	48	STS	M	66	AS	G3	0.67	30.265	
TCGA-02-0055	49	STS	F	62	GB	G4	0.21	41.632	
TCGA-06-0141	50	STS	M	62	GB	G4	0.86	37.862	
TCGA-06-0156	51	STS	M	57	GB	G4	0.49	30.494	
TCGA-06-0157	52	STS	F	63	GB	G4	0.27	33.730	
TCGA-06-0158	53	STS	M	73	GB	G4	0.9	32.793	
TCGA-06-0174	54	STS	M	54	GB	G4	0.27	31.000	
TCGA-06-0190	55	STS	M	62	GB	G4	0.87	41.013	
TCGA-06-0210	56	STS	F	72	GB	G4	0.61	40.169	
TCGA-06-0211	57	STS	M	47	GB	G4	0.99	35.539	
TCGA-06-0219	58	STS	M	67	GB	G4	0.06	39.554	
TCGA-06-0645	59	STS	F	55	GB	G4	0.48	35.629	
TCGA-06-0646	60	STS	M	60	GB	G4	0.48	29.318	
TCGA-06-0649	61	STS	F	73	GB	G4	0.18	32.594	
TCGA-06-0745	62	STS	M	59	GB	G4	0.65	30.927	
TCGA-06-0747	63	STS	M	53	GB	G4	0.22	35.285	
TCGA-06-0749	64	STS	M	50	GB	G4	0.22	32.428	
TCGA-06-0750	65	STS	M	43	GB	G4	0.08	38.153	
TCGA-06-2559	66	STS	M	83	GB	G4	0.41	38.990	
TCGA-06-5410	67	STS	F	72	GB	G4	0.3	34.485	
TCGA-06-5412	68	STS	F	78	GB	G4	0.38	43.930	
TCGA-06-5418	69	STS	F	75	GB	G4	0.23	38.650	
TCGA-06-5856	70	STS	M	58	GB	G4	0.31	27.796	
TCGA-12-0821	71	STS	M	62	GB	G4	0.88	37.981	
TCGA-12-3650	72	STS	M	46	GB	G4	0.91	34.726	
TCGA-12-5299	73	STS	F	56	GB	G4	0.27	35.987	
TCGA-14-0781	74	STS	M	49	GB	G4	0.08	38.564	
TCGA-14-0787	75	STS	M	69	GB	G4	0.19	38.367	
TCGA-14-0789	76	STS	M	54	GB	G4	0.94	37.309	
TCGA-14-0817	77	STS	F	69	GB	G4	0.45	40.432	
TCGA-14-1825	78	STS	M	70	GB	G4	0.64	29.449	
TCGA-16-0846	79	STS	M	85	GB	G4	0.33	28.800	
TCGA-19-2620	80	STS	M	70	GB	G4	0.41	32.739	
TCGA-19-2624	81	STS	M	51	GB	G4	0.01	30.694	
TCGA-19-2625	82	STS	F	76	GB	G4	0.34	39.934	
TCGA-26-5135	83	STS	F	72	GB	G4	0.74	31.788	

TCGA-27-1830	84	STS	M	57	GB	G4	0.42	27.851
TCGA-27-1832	85	STS	F	59	GB	G4	0.82	39.677
TCGA-27-2524	86	STS	M	56	GB	G4	0.63	41.187
TCGA-27-2526	87	STS	F	79	GB	G4	0.24	32.505
TCGA-28-1747	88	STS	M	44	GB	G4	0.21	32.149
TCGA-28-5207	89	STS	M	71	GB	G4	0.94	32.185
TCGA-28-5215	90	STS	F	62	GB	G4	0.92	28.017
TCGA-28-5218	91	STS	M	63	GB	G4	0.43	36.002
TCGA-32-1980	92	STS	M	72	GB	G4	0.1	30.711
TCGA-32-1982	93	STS	F	76	GB	G4	0.39	38.573
TCGA-32-2616	94	STS	F	48	GB	G4	0.61	37.559
TCGA-32-2632	95	STS	M	80	GB	G4	0.74	36.059
TCGA-41-2571	96	STS	M	89	GB	G4	0.07	28.926
TCGA-41-4097	97	STS	F	63	GB	G4	0.02	34.761
TCGA-76-4925	98	STS	M	76	GB	G4	0.4	37.358
TCGA-76-4926	99	STS	M	68	GB	G4	0.38	37.241
TCGA-76-4928	100	STS	F	85	GB	G4	0.26	35.963
TCGA-76-4929	101	STS	F	76	GB	G4	0.3	28.428
TCGA-76-4931	102	STS	F	70	GB	G4	0.76	32.399

Clinical, demographical, and  $F_1$  score information about all 102 subjects used in this study. There were 40 LTS (long-term survivors) (# 1-40) and 62 STS (short-term survivors) (# 41-102). The tumor types are as follows: AS: astrocytoma; GB: glioblastoma; OA: oligoastrocytoma; OD: oligodendroglioma. The tumor grades are G2 (grade II), G3 (grade III), and G4 (grade IV). Both age and survival are expressed in years. The  $F_1$  scores of all 102 new subjects used in this study [40 LTS (# 1-40) and 62 STS (# 41-102)] are listed.

According to the cut-off score of 25.2, as was calculated in the original study, if a subject has an  $F_1$  score < 25.2, then that subject is classified as LTS; otherwise, if a subject has an  $F_1$  score  $\geq$  25.2, then that subject is classified as STS. As can be seen here, all of the 40 LTS subjects were classified correctly except two (# 10 & 11), and all of the 62 STS subjects were classified correctly except one (# 43). "X" denotes a misclassification.

**Table S2.** Cox proportional hazards regression analyses in connection with the survival of all STS subjects (STS-LGG vs. STS-GBM) used in this study.

Model	Variables	$\beta$ coefficient	SE of $\beta$	P	HR	HR 95% CI (LL)	HR 95% CI (UL)	Notes
<b>A</b>	<b>Group (THC)</b>	0.444816	0.3823	<b>0.2446</b>	1.5602	0.7375	3.3008	<b>NSS</b>
<b>B</b>	<b>Group (THC)</b>	-2.253882	2.3991	<b>0.3475</b>	0.1050	0.0010	11.5690	<b>NSS</b>
	<b>Gender</b>	-0.400894	0.2816	<b>0.1546</b>	0.6697	0.3856	1.1631	<b>NSS</b>
	<b>Age</b>	0.016183	0.0138	<b>0.2422</b>	1.0163	0.9891	1.0443	<b>NSS</b>
	<b>TH Type</b>	0.161361	0.5493	<b>0.7689</b>	1.1751	0.4004	3.4485	<b>NSS</b>
	<b>TH Grade</b>	2.196131	1.9582	<b>0.2621</b>	8.9902	0.1936	417.4614	<b>NSS</b>

The particular model and its constituent independent variables, the Cox regression coefficient ( $\beta$ ), the standard error of the  $\beta$  coefficient, the probability of significance (P), the hazard ratio (HR), and the 95% confidence interval of the HR [(LL): lower limit and (UL): upper limit] are shown in connection with the survival of all STS subjects (STS-LGG vs. STS-GBM) used in this study. The first Cox proportional hazards regression analysis (Model A) revealed that when examined all by itself, the tumor histological classification (Group) [LGG (lower-grade glioma) vs. GBM (glioblastoma)] had no statistically significant effect on the survival of the STS subjects [Model A: Group variable (P=0.2446)]. To state it differently and equivalently, with respect to survival, the STS subjects with LGG could not be statistically differentiated from the STS subjects with GBM. The second Cox proportional hazards regression analysis (Model B) revealed that when examined together with the gender, age, tumor histological type, and tumor histological grade variables, the tumor histological classification (Group variable) had no statistically significant effect on the survival of the STS subjects [Model B: Group variable (P=0.3475)] either. The second Cox analysis also revealed that gender, age, tumor histological type (astrocytoma, glioblastoma, oligoastrocytoma, or oligodendroglioma), and tumor histological grade – as possible covariates – had no statistically significant effect on the survival of the STS subjects either [Model B: Gender (P=0.1546), Age (P=0.2422), TH Type (P=0.7689), and TH Grade (P=0.2621)]. The log-likelihood of the Model A was LogL = -196.951, whereas the log-likelihood of the Model B was LogL = -194.152 (P=0.2312), indicating that the Model B did not constitute a statistically significant improvement over the Model A. The significance level for all Cox analyses was set at  $\alpha=0.05$  (two-tailed). (NSS): not statistically significant.

**Table S3.** Cox proportional hazards regression analyses in connection with the survival of all STS subjects (STS-LGG<sub>1-2</sub> vs. STS-GBM<sub>1-2</sub>) used in both studies.

Model	Variables	$\beta$ coefficient	SE of $\beta$	P	HR	HR 95% CI (LL)	HR 95% CI (UL)	Notes
<b>A</b>	<b>Group (THC)</b>	0.380706	0.2571	<b>0.1387</b>	1.4633	0.8841	2.4220	<b>NSS</b>
<b>B</b>	<b>Group (THC)</b>	0.981924	1.1363	<b>0.3875</b>	2.6696	0.2879	24.7566	<b>NSS</b>
	<b>Gender</b>	-0.284170	0.2427	<b>0.2417</b>	0.7526	0.4677	1.2112	<b>NSS</b>
	<b>Age</b>	0.013326	0.0124	<b>0.2835</b>	1.0134	0.9890	1.0384	<b>NSS</b>
	<b>TH Type</b>	-0.220987	0.2723	<b>0.4171</b>	0.8017	0.4701	1.3672	<b>NSS</b>
	<b>TH Grade</b>	-0.424980	0.9137	<b>0.6419</b>	0.6538	0.1091	3.9194	<b>NSS</b>

The particular model and its constituent independent variables, the Cox regression coefficient ( $\beta$ ), the standard error of the  $\beta$  coefficient, the probability of significance (P), the hazard ratio (HR), and the 95% confidence interval of the HR [(LL): lower limit and (UL): upper limit] are shown in connection with the survival of all STS subjects (STS-LGG<sub>1-2</sub> vs. STS-GBM<sub>1-2</sub>) used in both studies (the original [1] and the present study). The first Cox proportional hazards regression analysis (Model A) revealed that when examined all by itself, the tumor histological classification (Group) [LGG (lower-grade glioma) vs. GBM (glioblastoma)] had no statistically significant effect on the survival of the STS subjects [Model A: Group variable (P=0.1387)]. To state it differently and equivalently, with respect to survival, the STS subjects with LGG could not be statistically differentiated from the STS subjects with GBM. The second Cox proportional hazards regression analysis (Model B) revealed that when examined together with the gender, age, tumor histological type, and tumor histological grade variables, the tumor histological classification (Group variable) had no statistically significant effect on the survival of the STS subjects [Model B: Group variable (P=0.3875)] either. The second Cox analysis also revealed that gender, age, tumor histological type (astrocytoma, glioblastoma, oligoastrocytoma, or oligodendroglioma), and tumor histological grade – as possible covariates – had no statistically significant effect on the survival of the STS subjects either [Model B: Gender (P=0.2417), Age (P=0.2835), TH Type (P=0.4171), and TH Grade (P=0.6419)]. The log-likelihood of the Model A was LogL = -255.690, whereas the log-likelihood of the Model B was LogL = -254.147 (P=0.5435), indicating that the Model B did not constitute a statistically significant improvement over the Model A. The significance level for all Cox analyses was set at  $\alpha=0.05$  (two-tailed). (NSS): not statistically significant.