

**Supplementary Table 2. Correlation of tumor GRK4 and clinicopathological characteristics**

	Training Cohort					Validation Cohort				
	negative	1+	2+	3+	<i>P</i> -value	negative	1+	2+	3+	<i>P</i> -value
N	53	25	30	18		40	20	13	16	
Age	49.36 ± 11.26	48.40 ± 8.97	53.90 ± 10.26	50.39 ± 7.72	0.17	52.02 ± 9.58	55.30 ± 9.02	55.85 ± 13.23	54.62 ± 9.66	0.51
Tumor diameter	8.62 ± 3.88	9.24 ± 3.87	8.00 ± 3.60	9.89 ± 4.44	0.38	7.25 ± 4.54	7.35 ± 4.55	7.58 ± 6.09	9.06 ± 7.94	0.72
Status					<0.01					0.04
Alive	8 (15.09%)	10 (40.00%)	18 (60.00%)	11 (61.11%)		11 (27.50%)	8 (40.00%)	4 (30.77%)	11 (68.75%)	
Dead	45 (84.91%)	15 (60.00%)	12 (40.00%)	7 (38.89%)		29 (72.50%)	12 (60.00%)	9 (69.23%)	5 (31.25%)	
Gender					0.40					0.58
Male	43 (81.13%)	23 (92.00%)	26 (86.67%)	17 (94.44%)		34 (85.00%)	19 (95.00%)	12 (92.31%)	15 (93.75%)	
Female	10 (18.87%)	2 ( 8.00%)	4 (13.33%)	1 ( 5.56%)		6 (15.00%)	1 ( 5.00%)	1 ( 7.69%)	1 ( 6.25%)	
Anatomic location					0.98					0.20
Left or other	24 (45.28%)	11 (44.00%)	14 (46.67%)	9 (50.00%)		3 ( 7.50%)	4 (20.00%)	4 (30.77%)	3 (18.75%)	
Right	29 (54.72%)	14 (56.00%)	16 (53.33%)	9 (50.00%)		37 (92.50%)	16 (80.00%)	9 (69.23%)	13 (81.25%)	
Number of tumors					0.95					0.98
Solitary	38 (71.70%)	18 (72.00%)	21 (70.00%)	14 (77.78%)		36 (90.00%)	18 (90.00%)	12 (92.31%)	14 (87.50%)	
Multiple	15 (28.30%)	7 (28.00%)	9 (30.00%)	4 (22.22%)		4 (10.00%)	2 (10.00%)	1 ( 7.69%)	2 (12.50%)	
Tumor type					0.43					0.97
Nodular	24 (45.28%)	9 (36.00%)	17 (56.67%)	7 (38.89%)		23 (57.50%)	12 (60.00%)	7 (53.85%)	10 (62.50%)	
Mass or diffuse	29 (54.72%)	16 (64.00%)	13 (43.33%)	11 (61.11%)		17 (42.50%)	8 (40.00%)	6 (46.15%)	6 (37.50%)	
Cirrhosis					0.87					0.37
No	23 (43.40%)	12 (48.00%)	15 (50.00%)	7 (38.89%)		23 (57.50%)	10 (50.00%)	6 (46.15%)	12 (75.00%)	
Yes	30 (56.60%)	13 (52.00%)	15 (50.00%)	11 (61.11%)		17 (42.50%)	10 (50.00%)	7 (53.85%)	4 (25.00%)	
Venous invasion					0.13					0.50
No	39 (73.58%)	13 (52.00%)	24 (80.00%)	13 (72.22%)		35 (87.50%)	19 (95.00%)	10 (76.92%)	14 (87.50%)	
Yes	14 (26.42%)	12 (48.00%)	6 (20.00%)	5 (27.78%)		5 (12.50%)	1 ( 5.00%)	3 (23.08%)	2 (12.50%)	
Grade					0.36					0.16

	1	5 ( 9.43%)	7 (28.00%)	5 (16.67%)	2 (11.11%)		1 ( 2.50%)	2 (10.00%)	1 ( 7.69%)	3 (18.75%)	
	2	42 (79.25%)	15 (60.00%)	20 (66.67%)	15 (83.33%)		31 (77.50%)	17 (85.00%)	12 (92.31%)	10 (62.50%)	
	3	6 (11.32%)	3 (12.00%)	5 (16.67%)	1 ( 5.56%)		8 (20.00%)	1 ( 5.00%)	0 ( 0.00%)	3 (18.75%)	
T Stage						0.37					0.45
	1	19 (35.85%)	5 (20.00%)	13 (43.33%)	5 (27.78%)		13 (32.50%)	7 (35.00%)	8 (61.54%)	7 (43.75%)	
	2	10 (18.87%)	6 (24.00%)	7 (23.33%)	7 (38.89%)		7 (17.50%)	4 (20.00%)	1 ( 7.69%)	3 (18.75%)	
	3	23 (43.40%)	12 (48.00%)	8 (26.67%)	6 (33.33%)		19 (47.50%)	8 (40.00%)	2 (15.38%)	5 (31.25%)	
	4	1 ( 1.89%)	2 ( 8.00%)	2 ( 6.67%)	0 ( 0.00%)		1 ( 2.50%)	1 ( 5.00%)	2 (15.38%)	1 ( 6.25%)	
GRK4 peritumor						0.05					0.26
	negative	0 ( 0.00%)	1 ( 4.00%)	1 ( 3.33%)	1 ( 5.56%)		5 (13.16%)	2 (10.53%)	0 ( 0.00%)	2 (13.33%)	
	1+	3 ( 5.66%)	1 ( 4.00%)	0 ( 0.00%)	2 (11.11%)		1 ( 2.63%)	2 (10.53%)	0 ( 0.00%)	1 ( 6.67%)	
	2+	19 (35.85%)	5 (20.00%)	8 (26.67%)	11 (61.11%)		9 (23.68%)	9 (47.37%)	2 (16.67%)	5 (33.33%)	
	3+	31 (58.49%)	18 (72.00%)	21 (70.00%)	4 (22.22%)		23 (60.53%)	6 (31.58%)	10 (83.33%)	7 (46.67%)	