Supplemental Table S1. Basic information of the selected SNPs.

CHR	POS	SNP	Alleles	FUNC	MAF	HWE
chr9	6216240	rs1157505	C/G	intron	0.263	0.275
chr9	6216516	rs11791561	C/G	intron	0.452	0.301
chr9	6218595	rs72614080	C/T	intron	0.277	0.329
chr9	6219845	rs1891385	A/C	intron	0.225	0.605
chr9	6220187	rs143589217	A/C	intron	0.047	0.729
chr9	6221246	rs16924144	C/T	intron	0.316	0.727
chr9	6222545	rs183791076	G/T	intron	0.053	0.539
chr9	6223819	rs10975495	A/G	intron	0.055	0.370
chr9	6226295	rs1418385	A/G	intron	0.473	0.672
chr9	6229417	rs16924159	A/G	intron	0.294	0.610
chr9	6230731	rs189217453	C/T	intron	0.049	0.307
chr9	6230736	rs182211245	C/T	intron	0.051	0.526
chr9	6242939	rs117414011	C/T	intron	0.074	0.128
chr9	6242950	rs4742170	C/T	intron	0.484	0.204
chr9	6247232	rs79981454	C/G	intron	0.039	0.199
chr9	6248408	rs76864631	A/G	intron	0.244	0.325
chr9	6252044	rs10758751	A/C	intron	0.076	0.518
chr9	6256292	rs1048274	A/G	untranslated-3	0.463	0.165

POS: position. MAF: minor allele frequency. HWE: *P* values of Hardy-Weinberg equilibrium test.
FUNC: functional region.

Supplemental Table S2. Coding scheme for the fitting of Cox model.

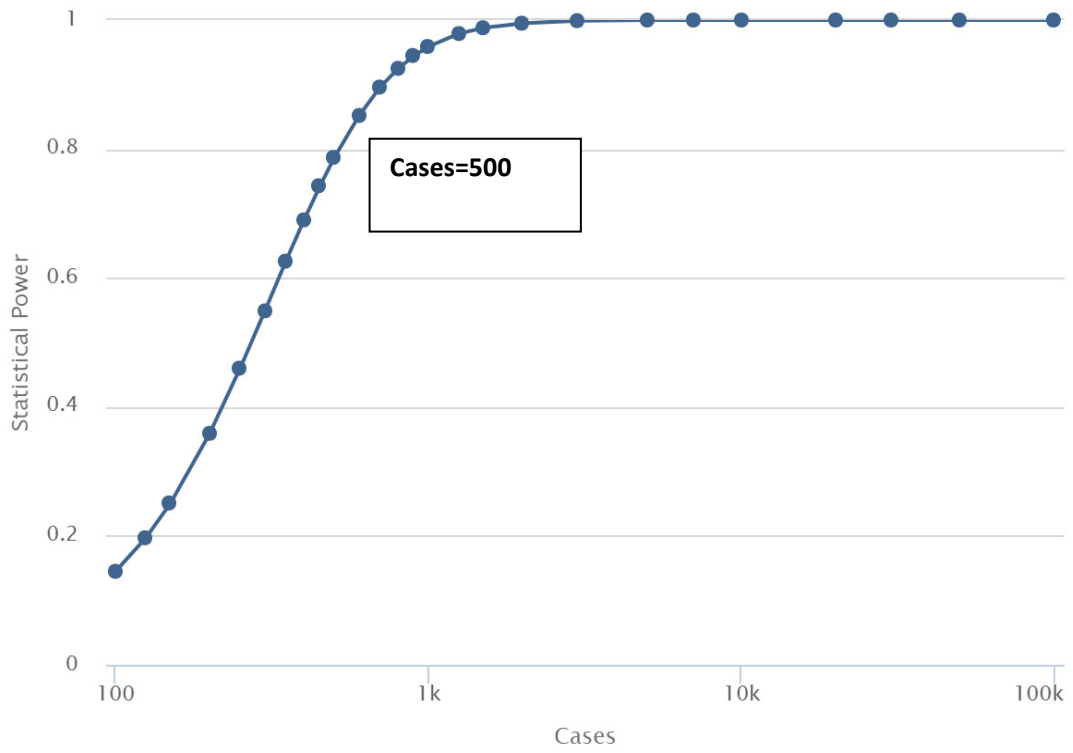| Variables	Coding Scheme	Category	Annotations
rs1048274_Genotype	0	GA+GG	Gentoype of rs1048274
	1	AA	
Age	0	Age>20	Age of the OS patients
	1	Age≤20	
Sex	0	male	Sex of the OS patients
	1	female	
Locations_int	0	Axial skeleton	Tumor location
	1	Long tubular bones	
Stages_int1	0	Stage I or Stage III	Enneking stages
	1	Stage II	
Stages_int2	0	Stage I or Stage II	Enneking stages
	1	Stage III	
Metastasis	0	Yes	-
	1	No	
Fractures	0	Yes	Pathological fracture
	1	No	

Supplemental Table S3. eQTL pattern for rs1048274 in multiple human tissues.

Gene Symbol	SNP	*P*-Value	NES	*T*-statistic	Tissue
IL-33	rs1048274	0.0076	-0.0960	-2.700	Esophagus - Muscularis
IL-33	rs1048274	0.01	-0.1200	-2.500	Skin - Not Sun Exposed (Suprapubic)
IL-33	rs1048274	0.05	0.1900	2.100	Brain - Substantia nigra
IL-33	rs1048274	0.07	-0.1300	-1.800	Brain - Caudate (basal ganglia)
IL-33	rs1048274	0.11	0.0970	1.600	Whole Blood
IL-33	rs1048274	0.12	-0.1300	-1.600	Brain - Amygdala
IL-33	rs1048274	0.13	0.0480	1.500	Artery - Tibial
IL-33	rs1048274	0.14	0.1100	1.500	Stomach
IL-33	rs1048274	0.17	-0.0650	-1.400	Artery - Aorta
IL-33	rs1048274	0.17	-0.0770	-1.400	Brain - Cerebellar Hemisphere
IL-33	rs1048274	0.17	-0.0740	-1.400	Colon - Sigmoid
IL-33	rs1048274	0.19	0.0500	1.300	Thyroid
IL-33	rs1048274	0.22	0.1000	1.200	Brain - Hypothalamus
IL-33	rs1048274	0.23	-0.0420	-1.200	Breast - Mammary Tissue
IL-33	rs1048274	0.24	0.0760	1.200	Prostate
IL-33	rs1048274	0.28	0.0400	1.100	Esophagus - Mucosa
IL-33	rs1048274	0.28	0.0350	1.100	Nerve - Tibial
IL-33	rs1048274	0.30	-0.0950	-1.000	Minor Salivary Gland
IL-33	rs1048274	0.33	0.0500	0.980	Testis
IL-33	rs1048274	0.36	-0.0880	-0.920	Uterus
IL-33	rs1048274	0.37	-0.0590	-0.910	Ovary
IL-33	rs1048274	0.39	-0.0540	-0.870	Brain - Cerebellum

IL-33	rs1048274	0.43	0.0410	0.800	Liver
IL-33	rs1048274	0.44	-0.0550	-0.770	Brain - Putamen (basal ganglia)
IL-33	rs1048274	0.44	-0.0240	-0.770	Heart - Left Ventricle
IL-33	rs1048274	0.50	-0.0490	-0.680	Brain - Nucleus accumbens (basal ganglia)
IL-33	rs1048274	0.52	0.0530	0.650	Adrenal Gland
IL-33	rs1048274	0.52	-0.0180	-0.640	Muscle - Skeletal
IL-33	rs1048274	0.57	0.0290	0.570	Small Intestine - Terminal Ileum
IL-33	rs1048274	0.60	-0.0440	-0.520	Pituitary
IL-33	rs1048274	0.71	-0.0270	-0.380	Brain - Cortex
IL-33	rs1048274	0.74	0.0100	0.330	Adipose - Subcutaneous
IL-33	rs1048274	0.75	-0.0170	-0.310	Brain - Anterior cingulate cortex (BA24)
IL-33	rs1048274	0.76	0.0100	0.300	Skin - Sun Exposed (Lower leg)
IL-33	rs1048274	0.77	0.0410	0.290	Cells - EBV-transformed lymphocytes
IL-33	rs1048274	0.79	0.0180	0.270	Brain - Frontal Cortex (BA9)
IL-33	rs1048274	0.80	0.0100	0.260	Lung
IL-33	rs1048274	0.80	-0.0140	-0.250	Vagina
IL-33	rs1048274	0.86	0.0150	0.180	Brain - Spinal cord (cervical c-1)
IL-33	rs1048274	0.86	0.0061	0.170	Heart - Atrial Appendage
IL-33	rs1048274	0.88	-0.0049	-0.160	Colon - Transverse
IL-33	rs1048274	0.89	0.0052	0.140	Adipose - Visceral (Omentum)
IL-33	rs1048274	0.91	-0.0082	-0.120	Artery - Coronary
IL-33	rs1048274	0.94	-0.0056	-0.078	Brain - Hippocampus
IL-33	rs1048274	0.94	0.0060	0.077	Pancreas
IL-33	rs1048274	0.96	0.0043	0.051	Spleen

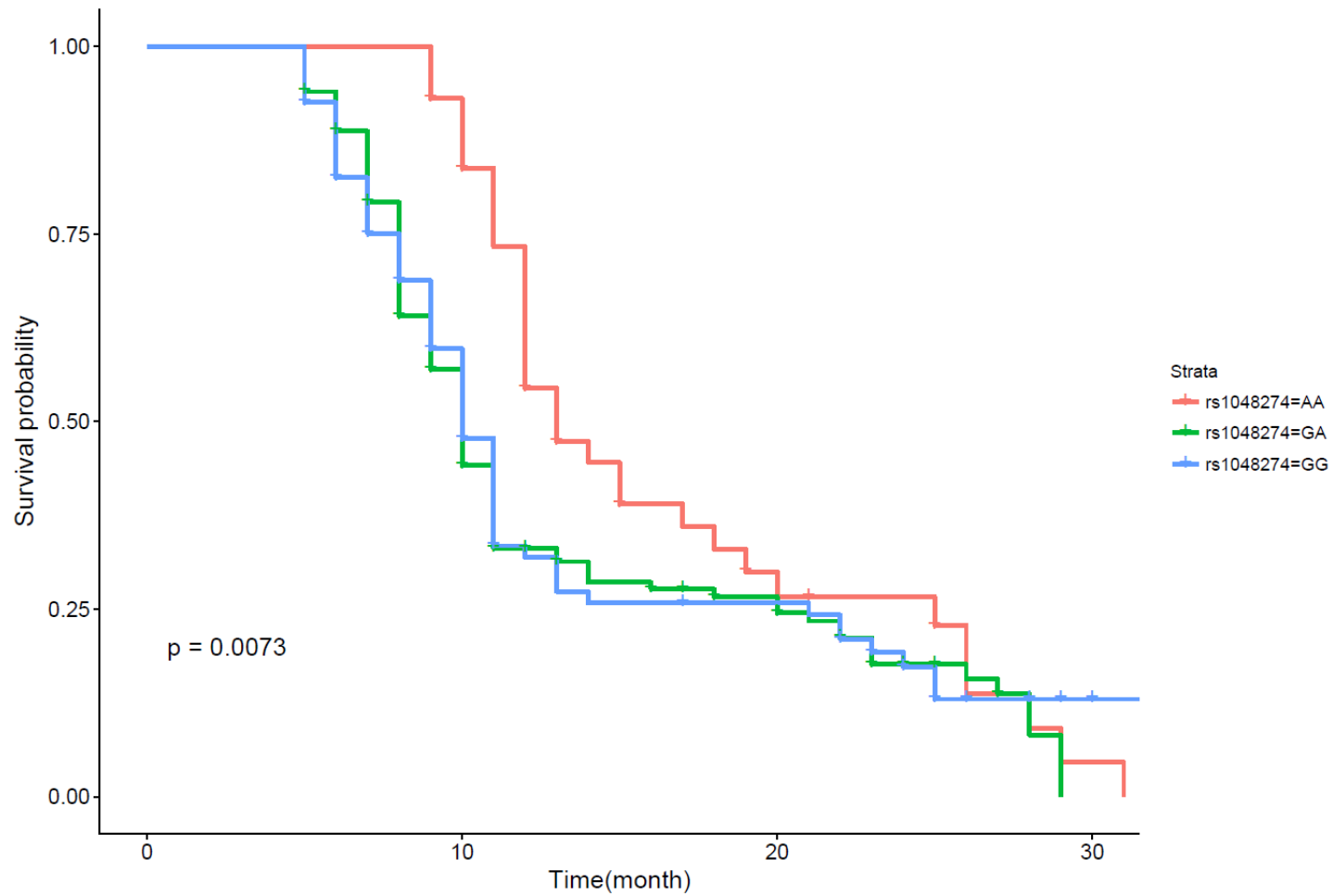| *IL-33* | rs1048274 | 0.99 | 0.0011 | 0.019 | Cells - Transformed fibroblasts |

NES: normalized effect size. Threshold of *P* value was 0.001.

Supplemental Figure S1. Number of cases required for detecting a SNP with relative risk equal to 1.4 at α=0.05 and different statistical power level.
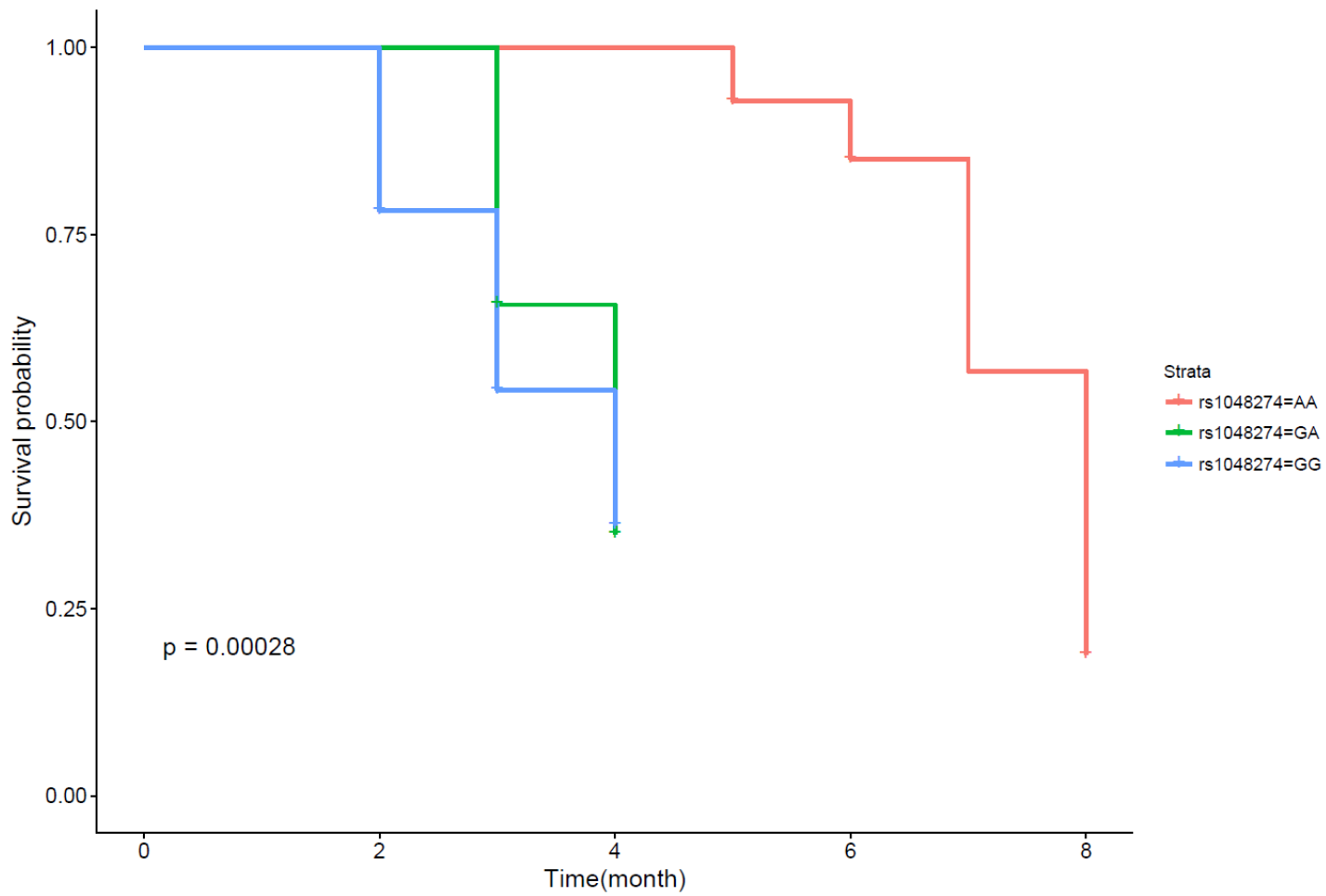
Supplemental Figure S2. LD structure of our selected SNPs. Values of r^2 were indicated in each cell.

Supplemental Figure S3. Kaplan-Meier analysis and survival plot for the survival of stage I OS patients with different genotypes of s1048274. *P* values for Kaplan-Meier analysis was indicated on the plot.
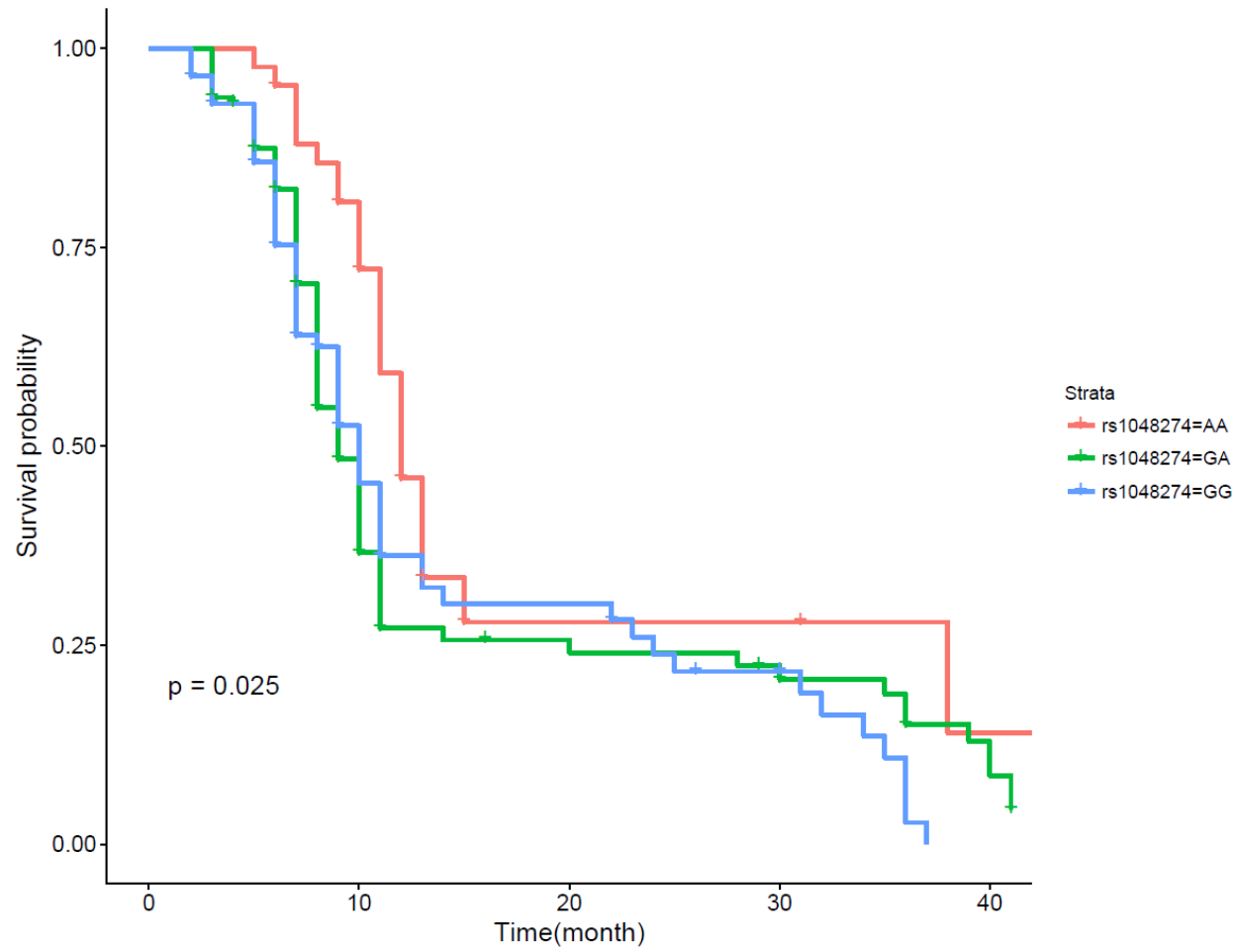
Supplemental Figure S4. Kaplan-Meier analysis and survival plot for the survival of stage II OS patients with different genotypes of s1048274. *P* values for

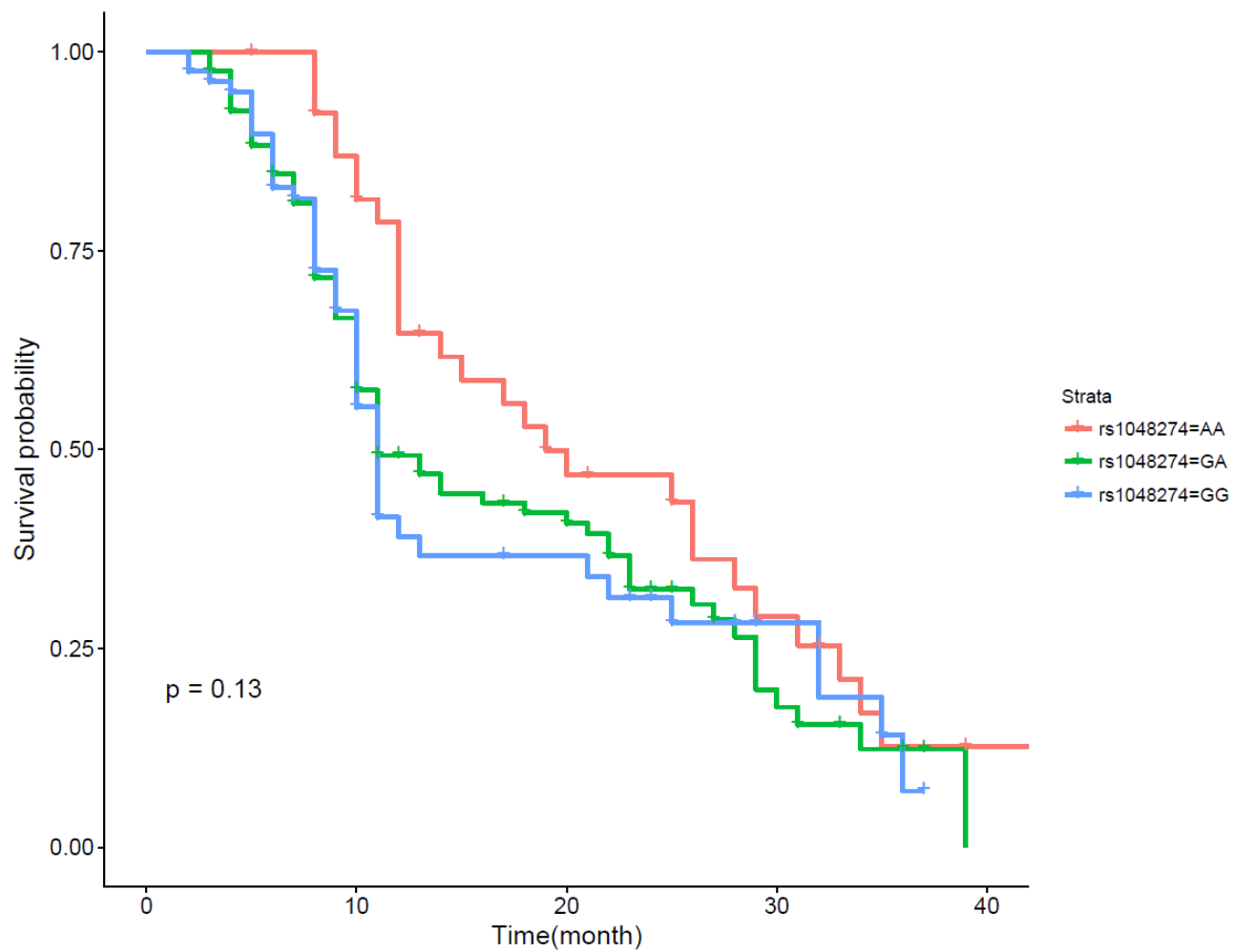Kaplan-Meier analysis was indicated on the plot.

p = 0.00028

Supplemental Figure S5. Kaplan-Meier analysis and survival plot for the survival of stage III OS patients with different genotypes of s1048274. *P* values for

Kaplan-Meier analysis was indicated on the plot.

Supplemental Figure S6. Kaplan-Meier analysis and survival plot for the survival of male OS patients with different genotypes of s1048274. *P* values for Kaplan-Meier analysis was indicated on the plot.

Supplemental Figure S7. Kaplan-Meier analysis and survival plot for the survival of female OS patients with different genotypes of s1048274. *P* values for

Kaplan-Meier analysis was indicated on the plot.