

Supplemental Data

Winter Temperature and UV Are Tightly Linked to Genetic Changes in the p53 Tumor Suppressor Pathway in Eastern Asia

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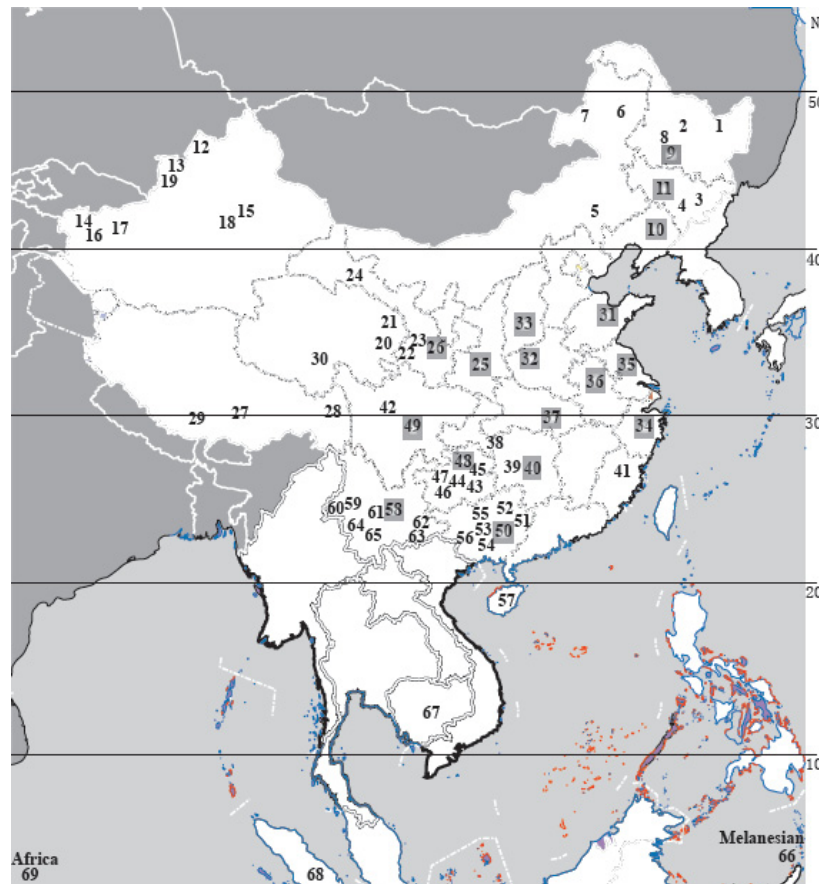


Figure S1. The geographic locations of the 67 eastern Asian populations sampled in this study. A map of China is shown indicating the locations of the 67 populations studied at different latitudes, as indicated by horizontal lines. The 17 Han Chinese populations are highlighted in shadows. Three control populations were also sampled with two from Africa and one from Melanesia.

Note: 1, Hezhe; 2, Oroqen; 3, Korea(Jilin); 4, Manchu(Liaonin); 5, Mongol; 6, Daur; 7, Ewenki; 8, Manchu(Heilongjiang); 9, Han(Heilongjiang); 10, Han(Liaonin); 11, Han(Jilin); 12, Russ; 13, Uzbek; 14, Tajik; 15, Kazak; 16, Khalkhas; 17, Uigur; 18, Tatar; 19, Xibe; 20, Salar; 21, Tu; 22, Baonan; 23, Dongxiang; 24, Yugur; 25, Han(Shannxi); 26, Han(Gansu); 27, Tibetan1(Dangxiong); 28, Tibetan2(Changdou); 29, Tibetan3(Rikaze); 30, Tibetan(Qinghai); 31, Han(Shandong); 32, Han(Henan); 33, Han(Shanxi); 34, Han(zhejiang); 35, Han(Jiangsu); 36,

Han(Anhui); 37, Han(Hubei); 38, Tujia; 39, Dong(Hunan); 40, Han(Hunan); 41, She(Fujian); 42, Qiang; 43, Dong(Guizhou); 44, Gelo; 45, Miao(Guizhou); 46, Buyi; 47, Shui; 48, Han(Guizhou); 49, Han(Sichuan); 50, Hakka(Guangxi); 51, Dong(Guangxi); 52, Yao(Guangxi); 53, Mulam; 54, Chuang(Guangxi); 55, Maonan; 56, Gin; 57, Li; 58, Han(Yunnan); 59, De'ang; 60, Jingpo; 61, Yi; 62, Chuang(Yunnan); 63, Miao(Yunnan); 64, Wa; 65, Dai; 66, Melanesian; 67, Cambodian; 68, Indonesian; 69, Africans(Pygmy and Ethiopian)

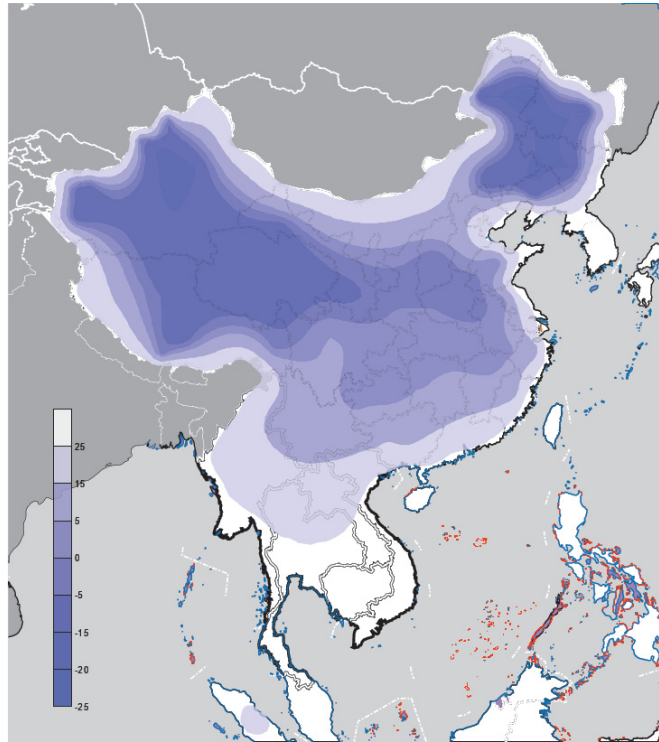


Figure S2. A contour map of winter temperature in eastern Asia.

The average winter temperatures of the 67 geographic locations where the 67 populations reside were used in constructing the map.

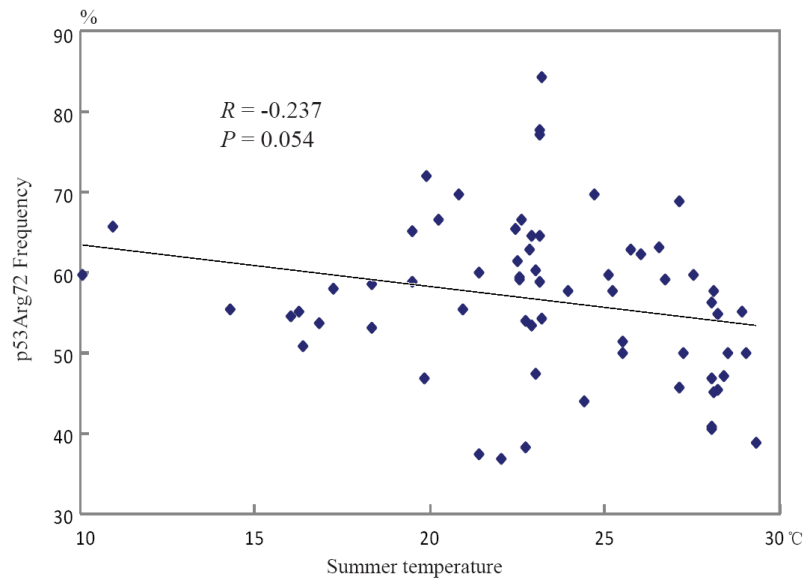


Figure S3. The correlation of p53Arg72 allele frequency with summer temperature in the 67 populations.

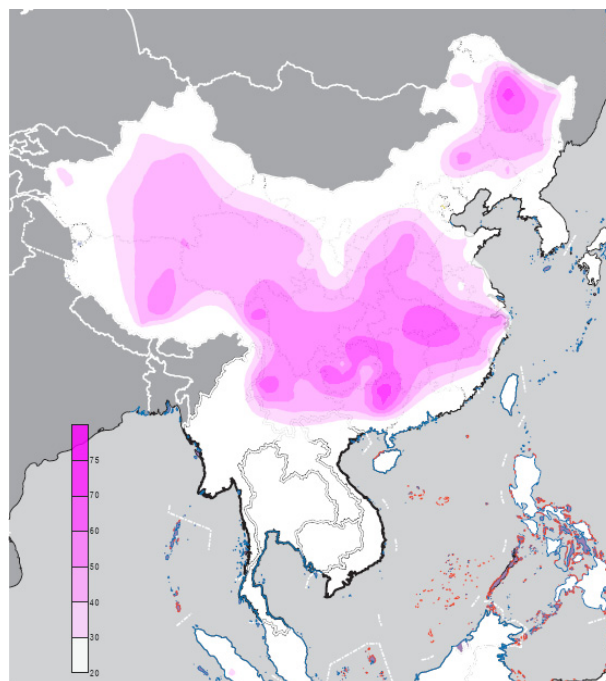


Figure S4. A contour map of MDM2 SNP309 G/G homozygote frequency distribution of the 67 populations in eastern Asia.

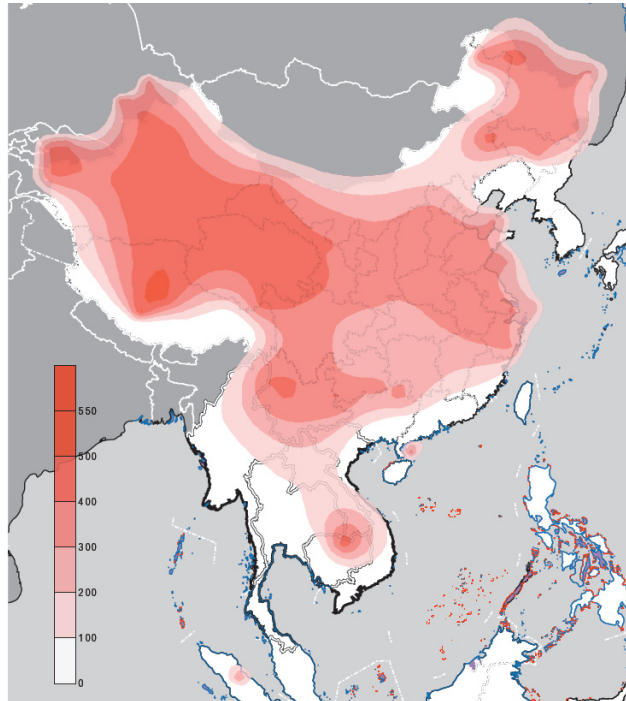


Figure S5. A contour map of UV radiation intensity in eastern Asia. The average annual UV radiation intensities of the 67 geographic locations where the 67 populations reside were used.

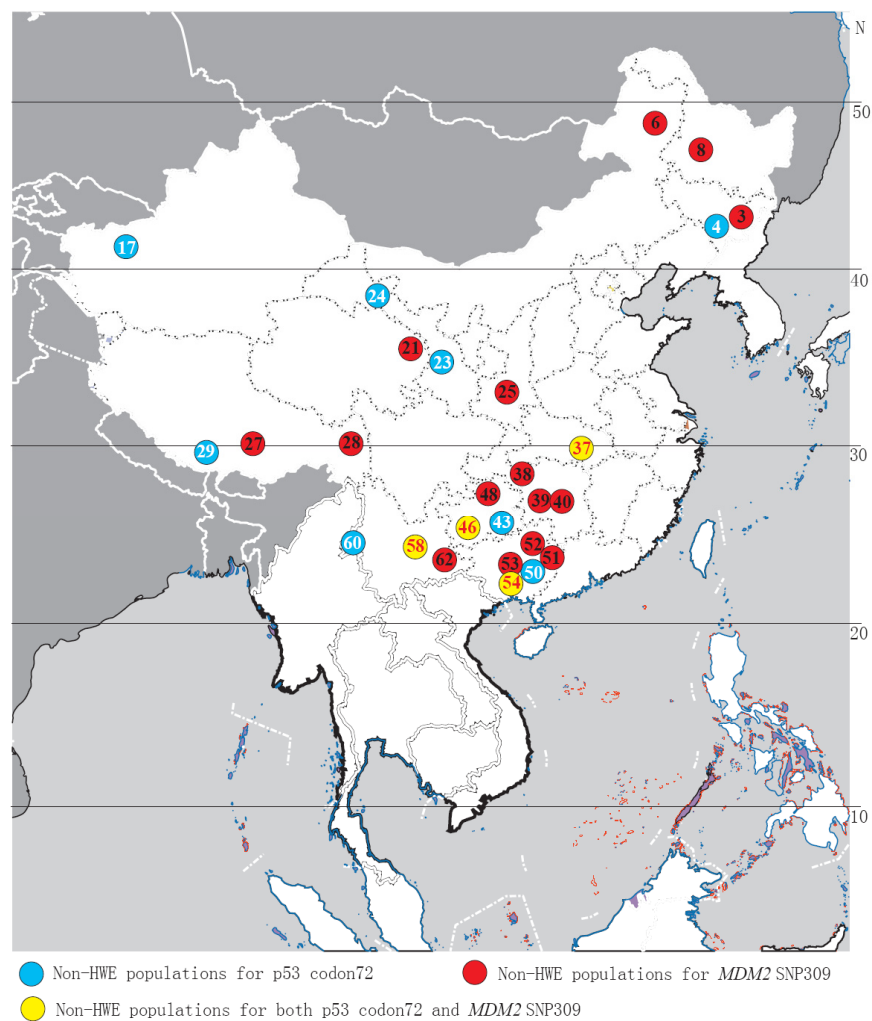


Figure S6. The geographic locations of the non-HWE populations.

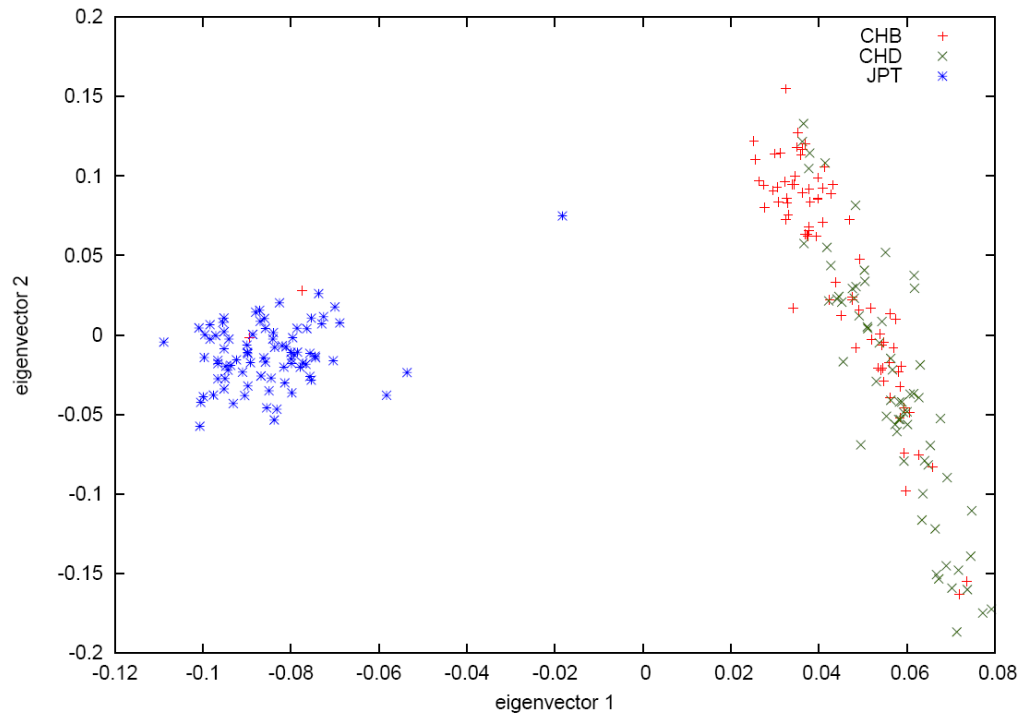


Figure S7. The relatedness among Han Chinese populations.

Note: This PCA map was constructed using Eigensoft. The genome-wide SNP analysis of three populations from Hapmap data (1,467,805 SNPs) was conducted, including one Japanese population (JPT, 82 individuals from Tokyo) and two Han Chinese populations, *i.e.* the CHB population (82 northern Han Chinese) and the CHD (70 Han Chinese from Denver of the States with different geographic origins in China).

Table S1. The allele frequency distribution of p53 Codon72 and MDM2 SNP309G/T polymorphisms in the 67 eastern Asian and 3 control populations.

Populations	Latitude	UV Radiation (MJ/m ²)	Low Temperature (°C)	Size	p53 Codon 72				Size	MDM2 Snp309			
					PP%	RP%	RR%	R%		TT%	TG%	GG%	G%
Oroqen	N49.5	336.72	-23.2	56	7.14	46.43	46.43	69.64	56	5.36	33.93	60.71	77.7
Ewenki	N49	458.57	-25.83	59	10.17	35.59	54.24	72.03	59	13.56	37.29	49.15	67.8
Hezhe	N47.5	325.40	-19.5	49	14.29	40.82	44.90	65.31	49	6.12	51.02	42.86	68.4
Daur	N47	458.57	-20.7	53	16.98	43.40	39.62	61.32	53	5.66	66.04	28.30	61.3
Russ	N47	401.10	-10.58	33	12.12	57.58	30.30	59.09	33	39.39	39.39	21.21	40.9
Han(Heilongjiang)	N46.5	345.29	-18.6	16	0.00	31.25	68.75	84.38	16	12.50	18.75	68.75	78.1
Manchu(Heilongjiang)	N46	345.29	-18.4	29	6.90	65.52	27.59	60.34	29	10.34	13.79	75.86	82.8
Han(Jilin)	N44	361.09	-15.1	57	17.54	47.37	35.09	58.77	57	8.77	43.86	47.37	69.3
Uzbek	N44	401.10	-10.65	30	16.67	60.00	23.33	53.33	30	26.67	53.33	20.00	46.7
Kazak	N44	405.93	-17.66	46	6.52	32.61	60.87	77.17	46	23.91	45.65	30.43	53.3
Tatar	N44	405.93	-17.66	47	2.13	40.43	57.45	77.66	47	12.77	53.19	34.04	60.6
Xibe	N44	401.10	-10.65	31	16.13	38.71	45.16	64.52	31	16.13	32.26	51.61	67.7
Korea(Jilin)	N43.5	335.63	-15.2	51	13.73	39.22	47.06	66.67	19	42.11	15.79	42.11	50
Manchu(Liaonin)	N42.5	348.84	-14.6	58	5.17	60.34	34.48	64.66	39	7.69	56.41	35.90	64.1
Mongol	N42.5	458.57	-15.82	50	14.00	46.00	40.00	63.00	50	12.00	28.00	60.00	74
Han(Liaonin)	N42	348.84	-11	38	5.26	50.00	44.74	69.74	38	18.42	34.21	47.37	64.5
Khalkhas	N39.5	415.10	-8.18	54	9.26	48.15	42.59	66.67	54	18.52	57.41	24.07	52.8
Uigur	N39	415.10	-5.72	50	6.00	62.00	32.00	63.00	50	10.00	56.00	34.00	62
Yugur	N39	433.81	-9.95	52	13.46	71.15	15.38	50.96	52	17.31	46.15	36.54	59.6
Tajik	N38	415.10	-11.94	40	15.00	60.00	25.00	55.00	40	17.50	55.00	27.50	55
Han(Shanxi)	N37.5	378.43	-4.4	45	17.78	48.89	33.33	57.78	45	0.00	46.67	53.33	76.7
Tu	N37	413.83	-7.89	50	20.00	44.00	36.00	58.00	50	18.00	30.00	52.00	67
Han(Shandong)	N37	350.32	-3	45	13.33	48.89	37.78	62.22	45	15.56	51.11	33.33	58.9
Salar	N36	413.83	-6.59	53	24.53	43.40	32.08	53.77	53	13.21	49.06	37.74	62.3
Baonan	N36	413.83	-6.86	49	22.45	48.98	28.57	53.06	49	18.37	51.02	30.61	56.1
Dongxiang	N36	381.16	-6.86	64	9.38	64.06	26.56	58.59	64	12.50	45.31	42.19	64.8
Han(Gansu)	N36	381.16	-5.82	32	12.50	56.25	31.25	59.38	32	25.00	53.13	21.88	48.4
Han(Shannxi)	N34.5	317.84	-0.42	49	12.24	57.14	30.61	59.18	49	24.49	22.45	53.06	64.3
Han(Henan)	N34	359.17	-0.3	57	8.77	56.14	35.09	63.16	57	10.53	40.35	49.12	69.3
Han(Jiangsu)	N34	323.38	4	35	34.29	40.00	25.71	45.71	35	8.57	48.57	42.86	67.1
Tibetan(Qinghai)	N33	434.18	-12.47	120	13.33	54.17	32.50	59.58	120	10.83	45.83	43.33	66.3
Han(Anhui)	N33	309.10	0.2	48	10.42	41.67	47.92	68.75	48	22.92	52.08	25.00	51
Qiang	N32	434.18	4.9	49	28.57	55.10	16.33	43.88	49	10.20	42.86	46.94	68.37
Han(Sichuan)	N32	322.81	5.6	59	11.86	61.02	27.12	57.63	59	10.17	37.29	52.54	71.2
Tibetan2(Changdou)	N31	438.79	-2.3	76	15.79	59.21	25.00	54.61	76	13.16	22.37	64.47	75.7
Tibetan1(Dangxiang)	N30.5	527.85	-9.4	729	11.66	45.13	43.21	65.78	729	12.48	30.45	57.06	72.3
Han(Zhejiang)	N30	302.11	4.3	33	24.24	60.61	15.15	45.45	33	9.09	30.30	60.61	75.8
Han(Hubei)	N30	307.71	4.06	41	34.15	31.71	34.15	50.00	41	19.51	9.76	70.73	75.6
Tujia	N30	285.09	4.77	31	9.68	61.29	29.03	59.68	31	25.81	19.35	54.84	64.5
Tibetan3(Rikaze)	N29	527.85	-3.2	36	8.33	72.22	19.44	55.56	36	11.11	47.22	41.67	65.3
Han(Guizhou)	N28	258.90	4.5	61	16.39	47.54	36.07	59.84	61	19.67	6.56	73.77	77
Dong(Hunan)	N27.5	285.09	4.9	45	17.78	64.44	17.78	50.00	45	15.56	20.00	64.44	74.4
Han(Hunan)	N27.5	285.09	5.2	21	23.81	42.86	33.33	54.76	21	28.57	19.05	52.38	61.9
She(Fujian)	N27	316.98	8.9	61	16.39	57.38	26.23	54.92	61	6.56	47.54	45.90	69.7
Gelo	N27	258.90	3.6	60	26.67	51.67	21.67	47.50	60	15.00	43.33	41.67	63.3
Dong(Guizhou)	N26.5	258.90	4.7	69	11.59	73.91	14.49	51.45	69	14.49	52.17	33.33	59.4
Miao(Guizhou)	N26	258.90	4.7	29	20.69	58.62	20.69	50.00	29	6.90	24.14	68.97	81
Buyi	N26	258.90	4.3	45	48.89	28.89	22.22	36.67	45	22.22	8.89	68.89	73.3
Shui	N26	258.90	4.8	12	16.67	58.33	25.00	54.17	12	16.67	16.67	66.67	75
Dong(Guangxi)	N26	293.58	7.9	16	31.25	43.75	25.00	46.88	16	12.50	12.50	75.00	81.3
Yao	N25	293.58	7.9	58	31.03	56.90	12.07	40.52	58	10.34	17.24	72.41	81
Maonan	N25	293.58	10.9	66	16.67	51.52	31.82	57.58	66	12.12	40.91	46.97	67.4
Gin	N25	331.03	15.1	49	38.78	40.82	20.41	40.82	49	18.37	36.73	44.90	63.3
Han(Yunnan)	N25	390.89	8.1	272	31.62	43.01	25.37	46.88	272	22.79	35.29	41.91	59.6
Hakka(Guangxi)	N24	293.58	10.4	10	0.00	90.00	10.00	55.00	10	0.00	40.00	60.00	80
Mulam	N24	293.58	10.9	61	32.79	44.26	22.95	45.08	61	21.31	29.51	49.18	63.9
De'ang	N24	401.52	8.1	33	15.15	39.39	45.45	65.15	33	3.03	24.24	69.70	81.8
Jingpo	N24	401.52	8.1	34	5.88	70.59	23.53	58.82	34	11.76	44.12	44.12	66.2
Yi	N24	390.89	8.7	45	22.22	44.44	33.33	55.56	44	9.09	36.36	54.55	72.7
Wa	N23.5	401.52	11.2	40	20.00	40.00	40.00	60.00	40	15.00	32.50	52.50	68.8
Chuang(Guangxi)	N23	331.03	12.9	33	18.18	69.70	12.12	46.97	33	21.21	6.06	72.73	75.8
Chuang(Yunnan)	N23	402.02	11.1	47	38.30	46.81	14.89	38.30	47	31.91	25.53	42.55	55.3
Miao(Yunnan)	N23	402.02	11.1	51	17.65	56.86	25.49	53.92	51	21.57	35.29	43.14	60.8
Dai	N23	404.84	11.2	51	39.22	47.06	13.73	37.25	51	21.57	41.18	37.25	57.8
Li	N19	358.34	19.3	63	39.68	42.86	17.46	38.89	63	9.52	42.86	47.62	69
Cambodian	N13	484.85	25	19	15.79	68.42	15.79	50.00	19	10.53	52.63	36.84	63.2
Indonesian	S10	487.76	26	78	17.95	51.28	30.77	56.41	51	21.57	56.86	21.57	50
Total				4029	17.78	49.67	32.56		3950	15.10	36.67	48.21	
Melanesian				10	80.00	20.00	0.00	10.00	10	50.00	40.00	10.00	30
Ethiopian				10	40.00	50.00	10.00	35.00	10	80.00	10.00	10.00	15.00
Pygmy				10	70.00	30.00	0.00	15.00	10	100.00	0.00	0.00	0.00

Note: MJ/m² is mega joules/year/m²

Table S2. The correlation coefficient values after Bonferroni correction.

Environmental Factors	Populations	p53 Codon72				MDM2 SNP309			
		PP	RP	RR	R	TT	TG	GG	G
Latitude	All (67) populations	-0.478(**)	-0.221	0.611(**)	0.640(**)	0.008	0.195	-0.193	-0.153
	Han (17) population	-0.378	-0.372	0.699(**)	0.672(**)	-0.140	0.212	-0.132	-0.039
UV Radiation	All (67) populations	-0.211	-0.013	0.189	0.232	-0.044	0.455(**)	-0.426(**)	-0.319(**)
	Han (17) population	-0.027	-0.144	0.173	0.130	-0.112	0.569(*)	-0.509	-0.344
Winter Temperature	All (67) populations	0.512(**)	0.213	-0.631(**)	-0.670(**)	0.036	-0.177	0.153	0.104
	Han (17) population	0.420	0.377	-0.739(**)	-0.772(**)	0.043	-0.124	0.100	0.058
Summer Temperature	All (67) populations	0.197	0.046	-0.209	-0.237	0.026	-0.183	0.169	0.125
	Han (17) population	0.028	0.270	-0.305	-0.219	-0.117	-0.194	0.265	0.258

Note: the numbers are the correlation coefficient values. * p < 0.05, ** p < 0.01

Table S3. The allele frequency distribution of the p53codon72 and MDM2 SNP309 polymorphisms in Han populations. The total number of Han Chinese patients studied was 919.

Populations	Latitude	p53 codon 72				MDM2 SNP309				Two loci genotypes									
		Size	PP	RP	RR	R%	TT	TG	GG	G%	PP/TT	PP/TG	PP/GG	RP/TT	RP/TG	RP/GG	RR/TT	RR/TG	RR/GG
Han(Heilongjiang)	46.5	16	0.00	31.25	68.75	84.38	12.50	18.75	68.75	78.13	0.00	0.00	0.00	6.25	12.50	12.50	6.25	6.25	56.25
Han(Jilin)	44	57	17.54	47.37	35.09	58.77	8.77	43.86	47.37	69.3	1.75	5.26	10.53	5.26	17.54	24.56	1.75	21.05	12.28
Han(Liaonin)	42	38	5.26	50.00	44.74	69.74	18.42	34.21	47.37	64.47	0.00	2.63	2.63	10.53	15.79	23.68	7.89	15.79	21.05
Han(Shanxi)	37.5	45	17.78	48.89	33.33	57.78	0.00	46.67	53.33	76.67	0.00	6.67	11.11	0.00	31.11	17.78	0.00	8.89	24.44
Han(Shandong)	37	45	13.33	48.89	37.78	62.22	15.56	51.11	33.33	58.89	0.00	6.67	6.67	6.67	31.11	11.11	8.89	13.33	15.56
Han(Gansu)	36	32	12.50	56.25	31.25	59.38	25.00	53.13	21.88	48.44	0.00	9.38	3.13	18.75	25.00	12.50	6.25	18.75	6.25
Han(Shannxi)	34.5	49	12.24	57.14	30.61	59.18	24.49	22.45	53.06	64.29	0.00	2.04	10.20	16.33	10.20	30.61	8.16	10.20	12.24
Han(Henan)	34	57	8.77	56.14	35.09	63.16	10.53	40.35	49.12	69.3	1.75	5.26	5.26	24.56	26.32	3.51	14.04	17.54	17.54
Han(Jiangsu)	34	35	34.29	40.00	25.71	45.71	8.57	48.57	42.86	67.14	8.57	11.43	14.29	0.00	25.71	14.29	0.00	11.43	14.29
Han(Anhui)	33	48	10.42	41.67	47.92	68.75	22.92	52.08	25.00	51.04	0.00	2.08	8.33	8.33	25.00	8.33	14.58	25.00	8.33
Han(Sichuan)	32	59	11.86	61.02	27.12	57.63	10.17	37.29	52.54	71.19	1.69	3.39	6.78	6.78	18.64	35.59	1.69	15.25	10.17
Han(Zhejiang)	30	33	24.24	60.61	15.15	45.45	9.09	30.30	60.61	75.76	3.03	6.06	15.15	6.06	15.15	39.39	0.00	9.09	6.06
Han(Hubei)	30	41	34.15	31.71	34.15	50.00	19.51	9.76	70.73	75.61	2.44	4.88	26.83	7.32	2.44	21.95	9.76	2.44	21.95
Han(Guizhou)	28	61	16.39	47.54	36.07	59.84	19.67	6.56	73.77	77.05	1.64	1.64	13.11	8.20	1.64	37.70	9.84	3.28	22.95
Han(Hunan)	27.5	21	23.81	42.86	33.33	54.76	28.57	19.05	52.38	61.9	14.29	4.76	4.76	0.00	4.76	38.10	14.29	9.52	9.52
Han(Yunnan)	25	272	31.62	43.01	25.37	46.875	22.79	35.29	41.91	59.56	7.72	9.56	14.34	9.56	14.71	18.75	5.51	11.03	8.82
Hakka(Guangxi)	24	10	0.00	90.00	10.00	55.00	0.00	40.00	60.00	80.00	0.00	0.00	0.00	0.00	40.00	50.00	0.00	0.00	10.00

Table S4. The partial correlation analysis of the p53 Condon72 and MDM2 SNP309 with the environmental factors.

Control Variables	Test		p53 Codon72 (67)				MDM2 SNP309 (67)			
			PP	RP	RR	R	TT	TG	GG	G
UV	Latitude	Correlation	-0.462	-0.221	0.600	0.629	0.014	0.145	-0.146	-0.113
		Sig. (2-tailed)	0.000	0.074	0.000	0.000	0.909	0.246	0.244	0.364
Winter	Latitude	Correlation	0.047	-0.061	0.030	-0.009	0.145	0.087	-0.162	-0.188
		Sig. (2-tailed)	0.709	0.626	0.812	0.942	0.245	0.487	0.193	0.131
Summer	Latitude	Correlation	-0.448	-0.217	0.588	0.614	0.016	0.149	-0.151	-0.122
		Sig. (2-tailed)	0.000	0.080	0.000	0.000	0.897	0.234	0.226	0.328
Altitude	Latitude	Correlation	-0.479	-0.220	0.613	0.640	0.008	0.199	-0.197	-0.156
		Sig. (2-tailed)	0.000	0.076	0.000	0.000	0.950	0.110	0.113	0.210
Longitude	Latitude	Correlation	-0.484	-0.211	0.607	0.639	0.027	0.217	-0.233	-0.195
		Sig. (2-tailed)	0.000	0.089	0.000	0.000	0.831	0.079	0.060	0.116
Latitude	UV	Correlation	-0.162	0.021	0.127	0.181	-0.045	0.439	-0.410	-0.303
		Sig. (2-tailed)	0.193	0.870	0.310	0.146	0.718	0.000	0.001	0.013
Winter	UV	Correlation	-0.110	0.039	0.056	0.104	-0.036	0.432	-0.406	-0.305
		Sig. (2-tailed)	0.379	0.757	0.657	0.404	0.772	0.000	0.001	0.013
Summer	UV	Correlation	-0.119	0.018	0.082	0.116	-0.035	0.438	-0.411	-0.307
		Sig. (2-tailed)	0.343	0.884	0.513	0.355	0.779	0.000	0.001	0.012
Altitude	UV	Correlation	-0.221	-0.104	0.285	0.296	-0.054	0.458	-0.424	-0.312
		Sig. (2-tailed)	0.075	0.404	0.020	0.016	0.668	0.000	0.000	0.011
Longitude	UV	Correlation	-0.213	-0.080	0.255	0.273	-0.142	0.416	-0.346	-0.213
		Sig. (2-tailed)	0.087	0.525	0.039	0.027	0.257	0.001	0.004	0.086
Latitude	Winter	Correlation	0.213	0.005	-0.203	-0.261	0.149	0.031	-0.111	-0.150
		Sig. (2-tailed)	0.086	0.971	0.101	0.034	0.232	0.804	0.374	0.228
UV	Winter	Correlation	0.486	0.216	-0.615	-0.652	0.026	-0.082	0.061	0.032
		Sig. (2-tailed)	0.000	0.082	0.000	0.000	0.834	0.511	0.627	0.800
Summer	Winter	Correlation	0.485	0.218	-0.620	-0.654	0.027	-0.103	0.082	0.050
		Sig. (2-tailed)	0.000	0.079	0.000	0.000	0.832	0.412	0.513	0.693
Altitude	Winter	Correlation	0.512	0.243	-0.662	-0.688	0.037	-0.162	0.137	0.090
		Sig. (2-tailed)	0.000	0.049	0.000	0.000	0.767	0.194	0.274	0.473
Longitude	Winter	Correlation	0.515	0.206	-0.630	-0.670	0.023	-0.194	0.182	0.133
		Sig. (2-tailed)	0.000	0.097	0.000	0.000	0.853	0.118	0.143	0.288
Latitude	Summer	Correlation	0.063	-0.023	-0.033	-0.060	0.029	-0.133	0.119	0.084
		Sig. (2-tailed)	0.613	0.857	0.795	0.634	0.815	0.286	0.342	0.505
UV	Summer	Correlation	0.090	0.047	-0.122	-0.126	-0.001	0.124	-0.118	-0.087
		Sig. (2-tailed)	0.470	0.705	0.331	0.314	0.996	0.320	0.345	0.488
Winter	Summer	Correlation	-0.068	-0.068	0.145	0.137	0.009	-0.113	0.110	0.086
		Sig. (2-tailed)	0.586	0.590	0.247	0.271	0.940	0.366	0.379	0.493
Altitude	Summer	Correlation	0.274	0.284	-0.500	-0.460	0.051	-0.146	0.121	0.077
		Sig. (2-tailed)	0.026	0.021	0.000	0.000	0.686	0.243	0.334	0.538
Longitude	Summer	Correlation	0.197	0.114	-0.273	-0.276	0.118	-0.116	0.055	-0.007
		Sig. (2-tailed)	0.113	0.364	0.026	0.025	0.344	0.352	0.663	0.954
Latitude	Altitude	Correlation	-0.056	0.156	-0.131	-0.051	0.007	0.127	-0.128	-0.103
		Sig. (2-tailed)	0.655	0.210	0.294	0.682	0.957	0.310	0.305	0.410
UV	Altitude	Correlation	0.076	0.188	-0.245	-0.197	0.032	-0.133	0.111	0.070
		Sig. (2-tailed)	0.544	0.131	0.047	0.113	0.798	0.287	0.374	0.574
Winter	Altitude	Correlation	0.048	0.197	-0.281	-0.215	0.012	0.095	-0.100	-0.084
		Sig. (2-tailed)	0.701	0.112	0.022	0.082	0.922	0.447	0.424	0.503
Summer	Altitude	Correlation	0.198	0.319	-0.476	-0.409	0.044	-0.043	0.022	0.001
		Sig. (2-tailed)	0.112	0.009	0.000	0.001	0.724	0.734	0.863	0.993
Longitude	Altitude	Correlation	-0.020	0.092	-0.070	-0.033	-0.128	0.014	0.058	0.105
		Sig. (2-tailed)	0.872	0.463	0.577	0.791	0.306	0.909	0.642	0.404
Latitude	Longitude	Correlation	0.094	-0.135	0.071	-0.011	-0.212	-0.225	0.340	0.360
		Sig. (2-tailed)	0.453	0.278	0.570	0.932	0.087	0.069	0.005	0.003
UV	Longitude	Correlation	-0.048	-0.170	0.204	0.156	-0.249	-0.028	0.177	0.247
		Sig. (2-tailed)	0.704	0.173	0.100	0.212	0.044	0.823	0.155	0.046
Winter	Longitude	Correlation	0.084	-0.141	0.091	0.008	-0.209	-0.218	0.330	0.350
		Sig. (2-tailed)	0.500	0.259	0.469	0.949	0.092	0.079	0.007	0.004
Summer	Longitude	Correlation	-0.039	-0.182	0.210	0.154	-0.239	-0.146	0.276	0.320
		Sig. (2-tailed)	0.758	0.143	0.091	0.216	0.053	0.242	0.025	0.009
Altitude	Longitude	Correlation	0.024	-0.080	0.056	0.022	-0.245	-0.166	0.299	0.343
		Sig. (2-tailed)	0.849	0.523	0.657	0.859	0.047	0.184	0.015	0.005

Table S5. The SNPs information of the p53 from the exon 2 to exon 6.

Sample	SNPs information									
	intron 2	intron 3			Exon 4 (Condon72)	intron 4				
	rs1642785	rs59758982	rs17883323	ss120037575	rs1042522	ss120037576	ss120037577	rs1794287	rs9895829	rs2909430
	C to G	16bp insertion	C to A	G to C	C to G	G to T	T to C	C to T	T to C	G to A
Dong-Hunan1	S	-	M	G	S	G	T	C	Y	A
Dong-Hunan2	S	-	M	G	S	G	T	C	Y	A
Dong-Hunan3	C	-	M	G	C	G	T	C	Y	A
Dong-Hunan4	G	-	C	G	G	G	T	C	T	R
Dong-Hunan5	S	-	C	G	S	G	T	C	T	A
Dong-Hunan6	S	-	M	G	S	G	T	C	Y	A
Dong-Hunan7	S	-	C	G	S	G	T	C	T	A
Dong-Hunan8	S	-	C	G	S	G	T	C	T	A
Buyi-Guizhou1	S	-	C	G	S	G	T	C	T	R
Buyi-Guizhou2	S	-	C	G	S	G	T	C	T	A
Buyi-Guizhou3	S	-	C	G	S	G	T	C	T	A
Buyi-Guizhou4	S	-	C	G	S	G	T	C	T	A
Buyi-Guizhou5	S	-	C	G	S	G	T	C	T	A
Buyi-Guizhou6	C	+/-	M	G	C	G	T	Y	Y	A
Buyi-Guizhou7	C	-	C	G	C	G	T	C	T	A
Buyi-Guizhou8	G	-	C	G	G	G	T	C	T	A
Buyi-Guizhou9	G	-	C	G	G	G	T	C	T	A
Buyi-Guizhou10	S	-	C	G	S	G	T	C	T	A
Buyi-Guizhou11	S	-	C	G	G	G	T	C	T	A
Buyi-Guizhou12	C	-	M	G	C	G	T	C	Y	A
Buyi-Guizhou13	C	-	A	G	C	G	T	C	C	A
Buyi-Guizhou14	G	-	C	G	G	G	T	C	T	A
Buyi-Guizhou15	G	-	C	G	G	G	T	C	T	A
Buyi-Guizhou16	C	-	C	G	C	G	T	C	T	R
Buyi-Guizhou17	S	-	C	G	S	G	T	C	T	A
Buyi-Guizhou18	S	-	C	G	S	G	T	C	T	A
Buyi-Guizhou19	G	-	C	G	G	G	T	C	T	A
Buyi-Guizhou20	S	-	C	G	S	G	T	C	T	A
Buyi-Guizhou21	G	-	C	G	G	G	T	C	T	A
Buyi-Guizhou22	S	-	C	G	S	G	T	C	T	A
Shui-Guizhou1	G	-	C	G	G	G	T	C	T	A
Shui-Guizhou2	S	-	C	G	S	G	T	C	T	A
Shui-Guizhou3	S	-	C	G	S	G	T	C	T	A
Shui-Guizhou4	S	-	C	G	S	G	T	C	T	A
Shui-Guizhou5	S	-	C	G	S	G	T	C	T	A
Shui-Guizhou6	S	-	C	G	S	G	T	C	Y	A
Shui-Guizhou7	G	-	C	G	G	G	T	C	T	A
Shui-Guizhou8	G	-	C	G	G	G	T	C	T	A
Chuang-Guangxi1	S	-	C	G	S	G	T	C	T	A
Chuang-Guangxi2	S	-	C	G	S	G	T	C	T	A
Chuang-Guangxi3	S	-	C	G	G	G	T	C	T	A
Chuang-Guangxi4	S	-	C	G	S	G	T	C	T	A
Chuang-Guangxi5	S	-	C	G	S	G	T	C	T	A
Chuang-Guangxi6	G	-	C	G	G	G	T	C	T	A
Chuang-Guangxi7	S	-	C	G	S	G	T	C	T	A
Yao-Guangxi1	G	-	C	G	G	G	T	C	T	A
Yao-Guangxi2	S	-	C	G	S	G	T	C	T	A
Yao-Guangxi3	S	-	C	G	S	G	T	C	T	A
Yao-Guangxi4	C	+/-	C	G	C	G	T	Y	T	A
Yao-Guangxi5	C	-	C	G	C	G	T	C	T	A
Yao-Guangxi6	G	-	C	G	G	G	T	C	T	A
Yao-Guangxi7	S	-	M	G	S	G	T	C	Y	A
Yao-Guangxi8	S	-	C	G	S	G	T	C	T	A
Yao-Guangxi9	S	-	C	G	S	G	T	C	T	A
Yao-Guangxi10	G	-	C	G	G	G	T	C	T	R
Yao-Guangxi11	S	-	C	G	S	G	T	C	Y	A
Yao-Guangxi12	G	-	C	G	G	G	T	C	T	R
Yao-Guangxi13	G	+/-	C	G	S	G	T	Y	T	A
Yao-Guangxi14	C	+/-	M	G	C	G	T	Y	Y	A
Yao-Guangxi15	S	-	C	G	S	G	T	C	T	A
Yao-Guangxi16	S	-	M	G	S	G	T	C	Y	A
Yao-Guangxi17	C	-	M	G	C	G	T	C	Y	A
Yao-Guangxi18	S	-	C	G	S	G	T	C	T	A
Yao-Guangxi19	G	-	C	G	G	G	T	C	T	A
Yao-Guangxi20	S	-	M	G	S	G	T	C	Y	A
Yao-Guangxi21	C	+/-	M	G	C	G	T	Y	Y	A
Yao-Guangxi22	C	+/-	C	G	C	G	T	Y	T	A
Yao-Guangxi23	G	-	C	G	G	G	T	C	T	A
Manchu-Heilongjiang1	S	-	C	G	S	G	T	C	T	R
Manchu-Heilongjiang2	S	+/-	C	G	S	G	T	Y	T	A
Manchu-Heilongjiang3	C	-	C	G	C	G	T	C	T	A
Manchu-Heilongjiang4	S	-	C	G	S	G	T	C	T	A
Manchu-Heilongjiang5	S	-	M	G	S	G	T	C	Y	A
Manchu-Heilongjiang6	S	-	M	G	S	G	T	C	Y	A

Han-Shanxi1	C	-	M	G	C	G	T	C	Y	A
Han-Shanxi2	G	-	C	G	G	G	T	C	T	A
Han-Shanxi3	G	-	C	G	G	G	T	C	T	A
Han-Shanxi4	G	+/+	C	G	S	G	T	Y	T	A
Han-Shanxi5	S	-	C	G	S	G	T	C	T	A
Han-Shanxi6	G	-	C	G	G	G	T	C	T	R
Han-Shanxi7	S	-	C	G	S	G	T	C	T	A
Han-Shanxi8	S	-	C	G	S	G	T	C	T	R
Han-Shanxi9	S	-	C	G	S	G	T	C	T	R
Han-Shanxi10	G	-	C	G	G	G	T	C	T	A
Han-Shanxi11	G	-	C	G	G	G	T	C	T	A
Han-Shanxi12	S	-	M	G	S	G	T	C	Y	A
Han-Shanxi13	G	-	C	G	G	G	T	C	T	A
Han-Shanxi14	S	-	C	G	S	G	T	C	T	A
Han-Shanxi15	S	-	M	G	S	G	T	C	Y	R
Han-Shanxi16	S	-	C	G	S	G	T	C	T	R
Han-Shanxi17	S	-	C	K	S	G	T	C	T	R
Han-Shanxi18	S	-	C	G	S	G	T	C	T	A
Han-Shanxi19	G	+/+	C	G	S	G	T	Y	T	G
Han-Shanxi20	G	+/+	C	G	S	G	T	Y	T	A
Han-Shanxi21	C	-	C	G	C	G	T	C	T	R
Han-Shanxi22	C	-	C	G	C	G	T	C	T	G
Han-Shanxi23	C	-	M	G	C	G	T	C	Y	R
Han-Zhejiang1	C	-	C	G	G	G	T	C	T	A
Han-Zhejiang2	S	-	M	G	S	K	T	C	Y	A
Han-Zhejiang3	G	-	M	G	C	G	T	C	C	A
Han-Zhejiang4	S	-	C	G	S	G	T	C	T	A
Han-Zhejiang5	G	+/+	C	G	C	G	T	Y	T	A
Han-Zhejiang6	C	-	C	G	G	G	T	C	T	A
Han-Zhejiang7	S	-	C	G	S	G	T	C	T	A
Han-Zhejiang8	S	-	M	G	S	G	T	C	Y	A
Han-Zhejiang9	S	-	C	G	S	G	T	C	T	A
Han-Zhejiang10	C	+/+	C	G	G	G	T	Y	T	A
Han-Zhejiang11	S	-	C	G	S	G	T	C	T	A
Han-Zhejiang12	S	-	C	G	S	G	T	C	T	A
Han-Zhejiang13	G	-	C	G	C	G	Y	C	T	A
Han-Zhejiang14	G	-	A	G	C	G	T	C	C	A
Han-Zhejiang15	S	-	C	G	G	G	T	C	T	R
Han-Zhejiang16	C	-	C	G	G	G	T	C	T	A
Han-Zhejiang17	S	-	C	G	S	G	T	C	T	A
Han-Zhejiang18	C	-	C	G	G	G	T	C	T	A
Han-Zhejiang19	S	-	C	G	S	G	T	C	T	A
Han-Zhejiang20	G	-	C	G	C	G	T	C	T	A
Han-Zhejiang21	G	-	C	G	C	G	T	C	T	A
Han-Zhejiang22	G	-	M	G	C	G	T	C	Y	A
Han-Zhejiang23	S	-	C	G	S	G	T	C	T	A
Han-Zhejiang24	S	-	C	G	S	G	T	C	T	A
Han-Anhui1	G	+/+	C	G	C	G	T	Y	T	A
Han-Anhui2	S	-	C	G	S	G	T	C	T	A
Han-Anhui3	C	-	C	G	G	G	T	C	T	A
Han-Anhui4	G	-	C	G	C	G	T	C	T	A
Han-Anhui5	S	-	C	G	S	G	T	C	T	A
Han-Anhui6	C	-	C	G	G	G	T	C	T	A
Han-Anhui7	G	-	C	G	C	G	T	C	T	A
Han-Anhui8	S	-	C	G	G	G	T	C	T	A
Han-Anhui9	C	-	C	G	G	G	T	C	T	A
Han-Anhui10	S	-	C	G	S	G	T	C	T	R
Han-Anhui11	S	-	C	G	S	G	T	C	T	A
Han-Anhui12	C	-	C	G	G	G	T	C	T	A
Han-Anhui13	C	-	C	G	G	G	T	C	T	A
Han-Anhui14	S	-	C	G	S	G	T	C	T	A
Han-Anhui15	C	-	C	G	G	G	T	C	T	A
Han-Anhui16	S	-	C	G	S	G	T	C	T	A
Han-Anhui17	S	-	C	G	S	G	T	C	T	A
Han-Anhui18	S	-	C	G	S	G	T	C	T	A
Han-Anhui19	C	-	C	G	G	G	T	C	T	A
Han-Anhui20	S	-	C	G	S	G	T	C	T	A
Han-Anhui21	C	-	C	G	C	G	T	C	T	A
Han-Anhui22	C	-	C	G	G	G	T	C	T	A
Han-Anhui23	S	-	C	G	S	G	T	C	T	A
Han-Anhui24	S	-	C	G	S	G	T	C	T	A
Han-Anhui25	G	+/+	C	G	C	G	T	C	T	R
Han-Anhui26	S	-	C	G	S	G	T	C	T	A
Han-Anhui27	C	-	C	G	G	G	T	C	T	A
Tujia-Hunan1	G	-	C	G	C	G	T	C	T	A
Tujia-Hunan2	S	-	C	G	S	G	T	C	T	A
Tujia-Hunan3	G	+/+	C	G	C	G	T	Y	T	A
Tujia-Hunan4	G	+/+	C	G	C	G	T	C	Y	R
Tujia-Hunan5	C	-	C	G	G	G	T	C	T	R
Tujia-Hunan6	C	-	C	G	G	G	T	C	T	A
Tujia-Hunan7	G	-	C	G	C	G	T	C	T	A
Tujia-Hunan8	G	-	C	G	C	G	T	C	T	A

Tujia-Hunan9	S	-	C	G	S	G	T	C	T	A
Tujia-Hunan10	G	-	M	G	C	G	T	C	Y	A
Tujia-Hunan11	C	-	C	G	G	G	T	C	T	A
Tujia-Hunan12	S	-	C	G	S	G	T	C	T	R
Tujia-Hunan13	S	-	C	G	S	G	T	C	T	R
Han-Hunan1	G	-	C	G	C	G	T	C	T	A
Han-Hunan2	C	+/-	C	G	S	G	T	Y	T	A
Han-Hunan3	C	-	C	G	G	G	T	C	T	A
Han-Hunan4	C	-	C	G	G	G	T	C	T	A
Han-Hunan5	C	-	C	G	G	G	T	C	T	A
Han-Hunan6	C	-	C	G	G	G	T	C	T	A
Han-Hubei	S	-	C	G	S	G	T	C	T	A
Han-Liaonin	G	-	C	G	G	G	T	C	T	A
Han-Liaonin	C	-	C	G	C	G	T	C	T	A
Han-Liaonin1	C	-	M	G	C	G	T	C	Y	A
Han-Liaonin2	C	-	C	G	S	G	T	C	T	A
Han-Liaonin3	G	-	C	G	G	G	T	C	T	A
Han-Liaonin4	S	-	M	G	S	G	T	C	Y	A
Han-Liaonin5	G	-	C	G	G	G	T	C	T	A
Han-Liaonin6	S	-	C	G	S	G	T	C	T	A
Han-Liaonin7	C	-	C	G	G	G	T	C	T	A
Han-Jilin1	S	-	M	G	S	G	T	C	Y	A
Han-Jilin2	S	-	C	G	S	G	T	C	T	A
Han-Jilin3	S	-	C	G	S	G	T	C	T	A
Han-Jilin4	S	-	M	G	S	G	T	C	Y	A
Han-Jilin5	G	-	C	G	G	G	T	C	T	A
African1	G	-	M	G	C	G	T	C	Y	R
African2	S	-	M	G	S	G	T	C	Y	A
African3	G	-	C	G	C	G	T	Y	T	A
African4	G	-	A	G	C	G	T	C	C	A
African5	G	+/-	M	G	C	G	T	Y	Y	A
African6	C	+/-	C	G	C	G	T	Y	T	A
African7	S	-	C	G	S	G	T	C	T	A
African8	G	-	M	G	C	G	T	C	Y	A
African9	S	-	M	G	S	G	T	C	Y	A
African10	G	-	C	G	C	G	T	C	T	A
African11	S	-	C	G	S	G	T	C	T	A
African12	S	/+	C	G	S	G	T	Y	T	A
African13	C	/+	C	G	S	G	T	Y	T	A
African14	G	/+	C	G	C	G	T	Y	T	A
African15	S	-	C	G	S	G	T	C	T	A
African16	G	+/+	C	G	C	G	T	T	T	A
African17	C	-	C	G	G	G	T	C	T	A
African18	C	+/-	C	G	S	G	T	C	T	A
African19	G	+/-	C	G	C	G	T	T	T	A
African20	G	+/-	C	G	C	G	T	Y	T	A

Table S6. The Hardy-Weinberg Equilibrium test of p53 Codon72 and MDM2 SNP309.

Population	p53 Codon72			MDM2 SNP309		
	Probability	HD*	HE*	Probability	HD*	HE*
	P-val	P-val	P-val	P-val	P-val	P-val
Russ	0.47	0.9174	0.258	0.2947	0.212	0.9365
Uzbek	0.4613	0.9214	0.2517	1	0.7483	0.5276
Tajik	0.3351	0.945	0.1717	0.7484	0.8283	0.3808
Kazak	0.6747	0.4184	0.8449	0.5642	0.3657	0.8261
Uigur	0.033	0.9963	0.0222	0.241	0.9436	0.167
Khalkhas	0.7597	0.8027	0.4102	0.4114	0.9077	0.2189
Tatar	0.4152	0.9447	0.2703	0.5489	0.8465	0.344
Xibe	0.4375	0.2837	0.9122	0.2111	0.1251	0.9753
Salar	0.408	0.2353	0.8994	1	0.7056	0.5192
Tu	0.5622	0.3192	0.8537	0.0261	0.0216	0.9961
Baonan	1	0.5388	0.6837	1	0.6808	0.5448
Dongxiang	0.0193	0.9976	0.0113	1	0.5612	0.6535
Yugur	0.0049	0.9996	0.003	0.7768	0.4661	0.746
Hezhe	0.5309	0.322	0.8619	0.3245	0.9405	0.196
Oroqen	0.7509	0.8386	0.3684	1	0.5456	0.7408
Korea	0.5264	0.272	0.8909	0.0042	0.0029	1
Manchu (Liaonin)	0.0217	0.9974	0.0157	0.2939	0.9576	0.1616
Mangol	1	0.5522	0.6831	0.0647	0.053	0.9898
Daur	0.5662	0.3425	0.8376	0.0081	0.9994	0.005
Ewenki	0.3475	0.2563	0.9006	0.2477	0.1847	0.9313
Han (Heilongjiang)	1	1	0.6941	0.1081	0.1081	0.9957
Han (Liaonin)	0.4428	0.9323	0.2535	0.1541	0.0973	0.9776
Han (Jilin)	1	0.5133	0.6965	1	0.6793	0.5646
Manchu (Heilongjiang)	0.1154	0.9914	0.0623	0.0173	0.0173	0.9995
Han (Gansu)	0.47	0.9174	0.258	1	0.7347	0.5338
Han (Shandong)	1	0.6938	0.5524	1	0.7277	0.5055
Han (Henan)	0.1618	0.965	0.1117	0.7562	0.4354	0.7823
Han (Shanxi)	1	0.5957	0.6447	0.0863	1	0.0466
Han (Shannxi)	0.2518	0.9358	0.1799	0.0004	0.0004	1
Han Zhejiang	0.3	0.9404	0.1998	0.3452	0.2559	0.9404
Tujia	0.2594	0.9678	0.1426	0.0016	0.0016	1
Han (Hubei)	0.0271	0.0163	0.9974	0	0	1
Dong (Hunan)	0.0782	0.9857	0.0574	0.0026	0.0026	0.9998
Han (Hunan)	0.6605	0.3846	0.8822	0.0074	0.0074	0.9997
Miao (Guizhou)	0.4719	0.8882	0.3208	0.2384	0.2384	0.9643
Han (Guizhou)	1	0.5452	0.6629	0	0	1
Tibetan (Dangxiang)	1	0.5499	0.5156	0	0	1
Tibetan (Changdou)	0.1115	0.9701	0.079	0.0011	0.0011	0.9999
Tibetan (Rikaze)	0.016	0.9992	0.008	1	0.701	0.5851
Tibetan (Qinghai)	0.2542	0.9354	0.1285	0.8412	0.665	0.4937
Han (Yunnan)	0.0282	0.0153	0.9919	0	0	1
Qiang	0.5628	0.8544	0.3192	1	0.5712	0.6848
Dong (Guizhou)	0.0001	1	0.0001	0.6199	0.8083	0.3564
Gelo	1	0.682	0.5184	0.5869	0.377	0.8073
Buyi	0.0119	0.0107	0.9984	0	0	1
Shui	1	0.8548	0.5514	0.0899	0.0899	0.9984
Hakka (Guangxi)	0.0455	1	0.0305	1	1	0.6935
Dong (Guangxi)	0.6376	0.4542	0.8719	0.0488	0.0488	0.9994
Yao (Guangxi)	0.2742	0.9449	0.149	0.0025	0.0025	0.9998
Chuang (Guangxi)	0.0384	0.9956	0.0299	0	0	1
Deang	0.4559	0.3159	0.8929	1	0.631	0.8103
Jingpo	0.0136	0.999	0.0109	1	0.5787	0.7152
Yi	0.5491	0.3274	0.8541	0.7138	0.4511	0.8038
Chuang (Yunnan)	1	0.5652	0.6754	0.001	0.0008	1
Miao (Yunnan)	0.4025	0.8942	0.2481	0.0774	0.0506	0.9872
Maonan	0.8022	0.7368	0.4494	0.5803	0.3625	0.818
Gin	0.3726	0.1927	0.9281	0.1373	0.1077	0.9681
Mulam	0.4407	0.262	0.8764	0.0055	0.0046	0.9992
She	0.3024	0.9255	0.1787	0.5427	0.8913	0.2741
Li	0.4344	0.2796	0.8673	1	0.5944	0.6375
Wa	0.327	0.2086	0.9297	0.1425	0.1039	0.9764
Dai	1	0.6066	0.6295	0.2626	0.184	0.9303
Han (Jiangsu)	0.3073	0.1842	0.9442	0.7122	0.8155	0.4554
Han (Anhui)	1	0.5145	0.7366	1	0.6948	0.528
Han (Sichuan)	0.1072	0.9841	0.055	0.5268	0.3207	0.8619
Cambodian	0.1876	0.9772	0.1486	1	0.8309	0.5213
Indonesian	0.8193	0.7094	0.4643	0.4092	0.8842	0.2637
	Fisher's method	Chi2: Df: 134 P = 0.0024		Fisher's method	Chi2: Df: 134 P = 0	

Note: * HD refers to the Hardy-Weinberg equilibrium test for heterozygote deficit, and HE refers to the Hardy-Weinberg equilibrium test for heterozygote excess. Populations deviated from HWE are highlighted.

Table S7. The two-loci genotype distribution of p53 Codon72 and MDM2 SNP309G/T polymorphisms in eastern Asian populations.

Populations	Latitude	UV Radiation MJ/m ²	Low temperature (°C)	Size	Two-loci Genotypes								
					PP/TT	PP/TG	PP/GG	RP/TT	RP/TG	RP/GG	RR/TT	RR/TG	RR/GG
Orogen	49.5	336.72	-23.2	56	0.00	0.00	7.14	3.57	21.43	21.43	1.79	12.50	32.14
Ewenki	49	458.57	-25.83	59	0.00	6.78	3.39	3.39	13.56	18.64	10.17	16.95	27.12
Hezhe	47.5	325.40	-19.5	49	0.00	6.12	8.16	4.08	22.45	14.29	2.04	22.45	20.41
Daur	47	458.57	-20.7	53	0.00	11.32	5.66	1.89	26.42	15.09	3.77	28.30	7.55
Russ	47	401.10	-10.58	33	0.00	9.09	3.03	24.24	18.18	15.15	15.15	12.12	3.03
Han (Heilongjiang)	46.5	345.29	-18.6	16	0.00	0.00	0.00	6.25	12.50	12.50	6.25	6.25	56.25
Manchu (Heilongjiang)	46	345.29	-18.4	29	0.00	3.45	3.45	6.90	3.45	55.17	3.45	6.90	17.24
Han (Jilin)	44	361.09	-15.1	57	1.75	5.26	10.53	5.26	17.54	24.56	1.75	21.05	12.28
Uzbek	44	401.10	-10.65	30	0.00	13.33	3.33	20.00	26.67	13.33	6.67	13.33	3.33
Kazak	44	405.93	-17.66	46	0.00	4.35	2.17	6.52	13.04	13.04	17.39	28.26	15.22
Tatar	44	405.93	-17.66	47	0.00	0.00	2.13	6.38	21.28	12.77	6.38	31.91	19.15
Xibe	44	401.10	-10.65	31	3.23	3.23	9.68	3.23	12.90	22.58	9.68	16.13	19.35
Korea (Jilin)	43.5	335.63	-15.2	19	0.00	5.26	5.26	10.53	10.53	21.05	31.58	0.00	15.79
Manchu(Liaonin)	42.5	348.84	-14.6	39	0.00	5.13	0.00	0.00	35.90	28.21	7.69	15.38	7.69
Mongol	42.5	458.57	-15.82	50	0.00	2.00	12.00	8.00	18.00	20.00	4.00	8.00	28.00
Han(Liaonin)	42	348.84	-11	38	0.00	2.63	2.63	10.53	15.79	23.68	7.89	15.79	21.05
Khalkhas	39.5	415.10	-8.18	54	0.00	7.41	1.85	7.41	27.78	12.96	11.11	22.22	9.26
Uigur	39	415.10	-5.72	50	0.00	4.00	2.00	8.00	30.00	24.00	2.00	22.00	8.00
Yugur	39	433.81	-9.95	52	1.92	11.54	0.00	11.54	26.92	32.69	3.85	7.69	3.85
Tajik	38	415.10	-11.94	40	5.00	7.50	2.50	10.00	30.00	20.00	2.50	17.50	5.00
Han(Shanxi)	37.5	378.43	-4.4	45	0.00	6.67	11.11	0.00	31.11	17.78	0.00	8.89	24.44
Tu	37	413.83	-7.89	50	4.00	6.00	10.00	6.00	10.00	28.00	8.00	14.00	14.00
Han (Shandong)	37	350.32	-3	45	0.00	6.67	6.67	6.67	31.11	11.11	8.89	13.33	15.56
Salar	36	413.83	-6.59	53	1.89	13.21	9.43	5.66	24.53	13.21	5.66	11.32	15.09
Baonan	36	413.83	-6.86	49	6.12	12.24	4.08	10.20	22.45	16.33	2.04	16.33	10.20
Dongxiang	36	381.16	-6.86	64	4.69	0.00	4.69	6.25	31.25	26.56	1.56	14.06	10.94
Han (Gansu)	36	381.16	-5.82	32	0.00	9.38	3.13	18.75	25.00	12.50	6.25	18.75	6.25
Han (Shannxi)	34.5	317.84	-0.42	49	0.00	2.04	10.20	16.33	10.20	30.61	8.16	10.20	12.24
Han (Henan)	34	359.17	-0.3	57	1.75	1.75	5.26	5.26	24.56	26.32	3.51	14.04	17.54
Han (Jiangsu)	34	323.38	4	35	8.57	11.43	14.29	0.00	25.71	14.29	0.00	11.43	14.29
Tibetan (Qinghai)	33	434.18	-12.47	120	1.67	6.67	5.00	5.00	25.83	23.33	4.17	13.33	15.00
Han (Anhui)	33	309.10	0.2	48	0.00	2.08	8.33	8.33	25.00	8.33	14.58	25.00	8.33
Qiang	32	434.18	4.9	49	0.00	12.24	16.33	10.20	22.45	22.45	0.00	8.16	8.16
Han (Sichuan)	32	322.81	5.6	59	1.69	3.39	6.78	6.78	18.64	35.59	1.69	15.25	10.17
Tibetan (Changdoug)	31	438.79	-2.3	76	2.63	3.95	9.21	7.89	10.53	40.79	2.63	7.89	14.47
Tibetan (Dangxiang)	30.5	527.85	-9.4	729	1.92	3.16	6.58	5.35	14.13	25.65	5.21	13.17	24.83
Han (Zhejiang)	30	302.11	4.3	33	3.03	6.06	15.15	6.06	15.15	39.39	0.00	9.09	6.06
Han(Hubei)	30	307.71	4.06	41	2.44	4.88	26.83	7.32	2.44	21.95	9.76	2.44	21.95
Tujia	30	285.09	4.77	31	3.23	0.00	6.45	19.35	16.13	25.81	3.23	3.23	22.58
Tibetan (Rikaze)	29	527.85	-3.2	36	2.78	5.56	0.00	5.56	33.33	33.33	2.78	8.33	8.33
Han(Guizhou)	28	258.90	4.5	61	1.64	1.64	13.11	8.20	1.64	37.70	9.84	3.28	22.95
Dong (Hunan)	27.5	285.09	4.9	45	4.44	0.00	13.33	11.11	13.33	40.00	0.00	6.67	11.11
Han (Hunan)	27.5	285.09	5.2	21	14.29	4.76	4.76	0.00	4.76	38.10	14.29	9.52	9.52
She(Fujian)	27	316.98	8.9	61	0.00	9.84	6.56	6.56	26.23	24.59	0.00	11.48	14.75
Gelo	27	258.90	3.6	60	5.00	6.67	15.00	6.67	26.67	18.33	3.33	10.00	8.33
Dong (Guangxi)	26	293.58	7.9	16	6.25	6.25	18.75	6.25	6.25	31.25	0.00	0.00	25.00
Miao (Guizhou)	26	258.90	4.7	29	0.00	10.34	10.34	6.90	3.45	48.28	0.00	10.34	10.34
Buyi	26	258.90	4.3	45	13.33	2.22	33.33	6.67	4.44	17.78	2.22	2.22	17.78
Shui	26	258.90	4.8	12	0.00	0.00	16.67	8.33	8.33	41.67	8.33	8.33	8.33
Dong (Guizhou)	26.5	258.90	4.7	69	0.00	8.70	2.90	10.14	39.13	24.64	4.35	4.35	5.80
Yao	25	293.58	7.9	58	1.72	3.45	25.86	8.62	10.34	37.93	0.00	3.45	8.62
Maonan	25	293.58	10.9	66	0.00	6.06	10.61	7.58	21.21	22.73	4.55	13.64	13.64
Gin	25	331.03	15.1	49	8.16	16.33	14.29	6.12	18.37	16.33	4.08	2.04	14.29
Han (Yunnan)	25	390.89	8.1	272	7.72	9.56	14.34	9.56	14.71	18.75	5.51	11.03	8.82
Hakka (Guangxi)	24	293.58	10.4	10	0.00	0.00	0.00	0.00	40.00	50.00	0.00	0.00	10.00
Mulam	24	293.58	10.9	61	1.64	13.11	18.03	16.39	11.48	16.39	3.28	4.92	14.75
De'ang	24	401.52	8.1	33	0.00	3.03	12.12	3.03	9.09	27.27	0.00	15.15	30.30
Jingpo	24	401.52	8.1	34	0.00	0.00	5.88	8.82	32.35	29.41	2.94	11.76	8.82
Yi	24	390.89	8.7	44	4.55	6.82	11.36	2.27	15.91	25.00	2.27	13.64	18.18
Wa	23.5	401.52	11.2	40	2.50	10.00	7.50	7.50	7.50	25.00	5.00	15.00	20.00
Chuang (Guangxi)	23	331.03	12.9	33	3.03	0.00	15.15	15.15	6.06	48.48	3.03	0.00	9.09
Chuang (Yunnan)	23	402.02	11.1	47	10.64	8.51	19.15	17.02	10.64	19.15	4.26	6.38	4.26
Miao(Yunnan)	23	402.02	11.1	51	0.00	7.84	9.80	9.80	21.57	25.49	11.76	5.88	7.84
Dai	23	404.84	11.2	51	9.80	13.73	15.69	9.80	15.69	21.57	1.96	11.76	0.00
Li	19	358.34	19.3	63	4.76	14.29	20.63	1.59	20.63	20.63	3.17	7.94	6.35
Cambodian	13	484.85	25	19	0.00	10.53	5.26	10.53	42.11	15.79	0.00	0.00	15.79
Indonesian	10	487.76	26	51	3.92	3.92	1.96	15.69	29.41	15.69	1.96	23.53	3.92
Total				3950									
Melanesian				10	50.00	30.00	0.00	0.00	10.00	10.00	0.00	0.00	0.00
Pygmy				10	30.00	10.00	0.00	50.00	0.00	0.00	0.00	0.00	10.00
Ethiopia				10	70.00	0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00

Note: MJ/m² is mega joules/year/m²

Table S8. The latitude, UV radiation and low temperature correlation analysis on the two-loci genotype combination.

Environmental Factors	Populations	Two-loci genotypes								
		PP/TT	PP/TG	PP/GG	RP/TT	RP/TG	RP/GG	RR/TT	RR/TG	RR/GG
Latitude	All populations (67)	-0.43**	-0.27*	-0.35**	-0.04	0.06	-0.18	0.36**	0.46**	0.33**
	Han population (17)	-0.425	-0.084	-0.302	0.168	0.06	-0.547*	-0.08	0.42	0.562*
UV Radiation	All populations (67)	-0.137	0.205	-0.408**	0.03	0.319**	-0.309*	-0.008	0.37**	-0.036
	Han population (17)	-0.193	0.446	-0.152	0.248	0.376	-0.606**	-0.311	0.435	0.073
Low Temperature	All populations (67)	0.353**	0.194	0.446**	0.16	-0.015	0.196	-0.322**	-0.449**	-0.322**
	Han population (17)	0.414	0.144	0.346	-0.227	0.018	0.509*	-0.017	-0.379	-0.588*

Note: * Correlation is significant at the 0.05 level; ** Correlation is significant at the 0.01 level (two-tailed t test).