

Table SI. Mutational signatures analysis of the tumors.

	P1	P1	P3	P3	P3	P3	P4	P6	P6	P6	P7	P7	
Signature	Seminoma	Thyroid cancer	Melanoma	Melanoma	Melanoma	Melanoma	Ovarian cancer	Thyroid cancer	Dermatofibroma	Dysplastic nevus	Breast cancer	Thyroid cancer	Proposed etiology
SBS1, %	3.23	3.7	0	0.25	0	0.5	0.43	2.05	9.79	0	5.4	4.4	Clock-like ^a
SBS5, %	1.96	0	0	0	0	0	0	0	8.56	0	0	0	Clock-like ^a
SBS4, %	3.39	0	18.8	13.4	1.7	19	21.7	4.48	0	24.9	2.4	3.2	Tobacco smoking
SBS7b, %	1.75	2.77	6.01	4.54	3.4	3.6	6.76	1.65	3.79	7.25	0.1	0	UV light
SBS6, %	10.8	3.74	12	8.57	2.4	5.7	11.2	13	12.5	11.8	2.1	7.3	Defective DNA mismatch repair
SBS43, %	4.05	3	6.94	6.57	4	5.8	3.39	4.39	1	4.62	3.7	4.4	Defective DNA mismatch repair
SBS26, %	3.51	0	0	0	0	0	0	0	0.75	0	5.2	4.9	Defective DNA mismatch repair
SBS18, %	0	0	0	0	5.5	0.1	0	0	0	0	0	0	Damage by ROS
SBS30, %	3.35	2.15	0	0	0.2	1.3	0	0	0	0.44	7.8	5.3	Defective BER
SBS84, %	1.73	11.8	0.25	2.28	1.4	1.7	0	2.86	0	0.37	0	1.7	Activity of activation-induced cytidine deaminase
SBS24, %	0	0	1.51	0.15	5.8	3.5	5.08	0	1.73	4.56	1.7	0	Aflatoxin exposure
SBS25, %	4.47	6.34	0.44	6.77	5.2	4.7	1.38	0	0	0.72	6.5	5.8	CT treatment
SBS31, %	5.13	3.82	3.74	4.81	0.9	1.4	0.54	6.29	1.67	1.05	2.2	5.4	Platinum CT treatment
SBS87, %	7.82	4.83	9.47	6.89	3.7	3.8	8.76	10.9	14.2	7.19	8	8.6	Thiopurine CT treatment

BER, base excision repair; CT, chemotherapy; ROS, reactive oxygen species; SBS, Single Base Substitution. Mutational signatures with values >5% are in bold. ^aSignatures SBS1 and SBS5 are both clock-like in that the number of mutations in most cancers and normal cells correlates with the age of the individual. However, the rates of acquisition of these mutations over time differ markedly between different cancer types and normal cell types. For SBS1, these differences correlate with the estimated rates of stem cell division in different tissues, suggesting that SBS1 may function as a cell division or mitotic clock. By contrast, SBS5 shows no clear correlation with stem cell division rates or with SBS1 mutation rates.