Clonal hematopoiesis of indeterminate potential-related epigenetic age acceleration correlates with clonal hematopoiesis of indeterminate potential clone size in patients with high morbidity

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Supplementary Information

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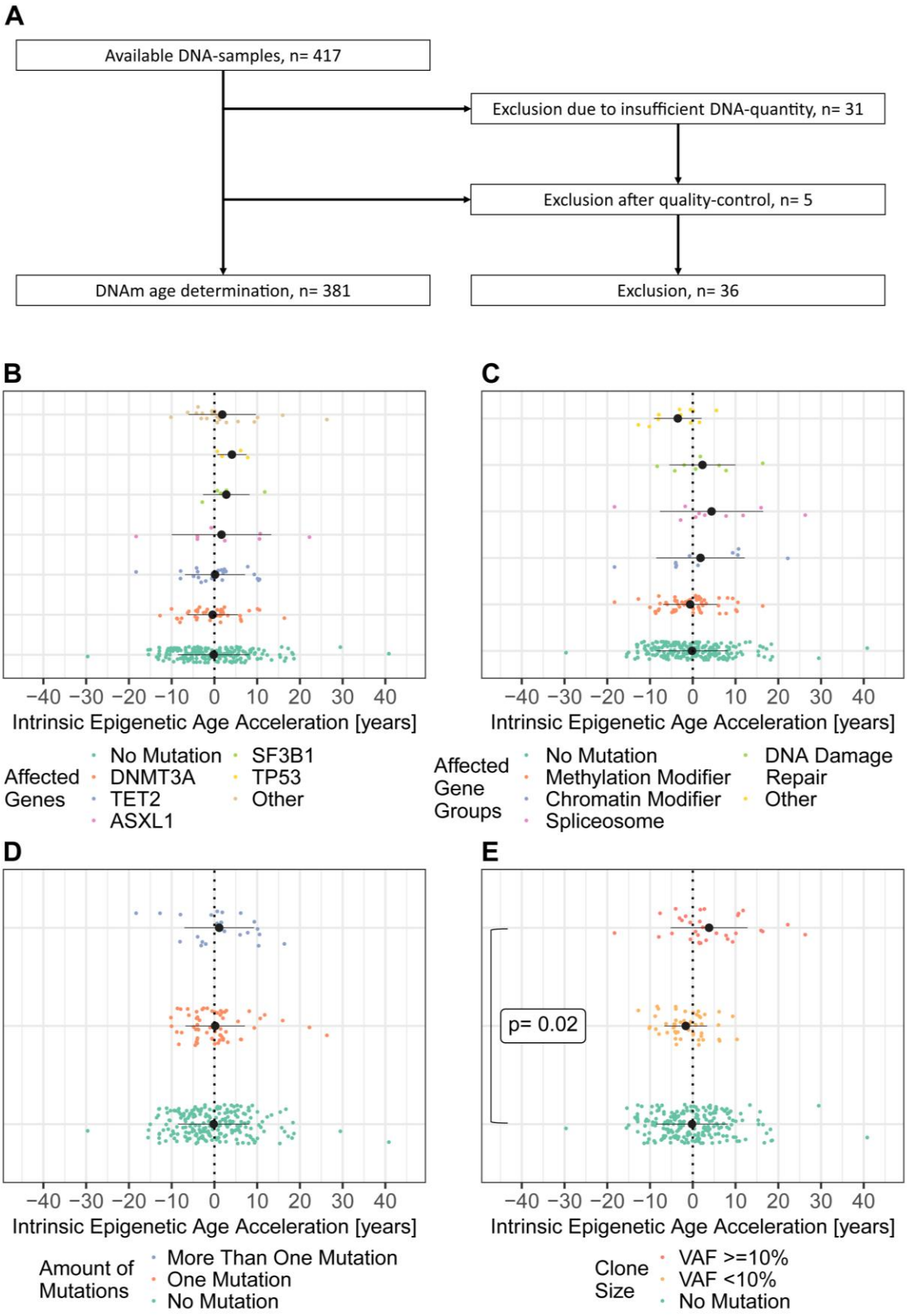
Supplemental Figure S1: Consort diagram, clonal hematopoiesis of indeterminate potential (CHIP) characteristics and intrinsic epigenetic age acceleration (IEAA). A Flowchart depicting inclusion and exclusion criteria for the 417 available DNA samples. **B** Jittered dot plot of IEAA by affected gene. **C** Jittered dot plot of IEAA by affected gene group. **D** Jittered dot plot of IEAA by number of CHIP mutations. **E** Jittered dot plot of IEAA by CHIP clone size. Mean and standard deviation are shown in black.



Supplemental Table S1: Clinical features and age acceleration. Comparison of mean age acceleration (AA) and intrinsic epigenetic age acceleration (IEAA) for common risk factors and comorbidities in our cohort. P-values were determined by Mann-Whitney-test.

Variable		Mean AA [years]	p-value	Mean IEAA [years]	p-value
Sex	Female	-1.19	.006*	-1.75	.001*
	Male	0.98		1.22	
Malignant Tumor	Yes	-0.31	.694	-0.47	.577
	No	0.07		0.13	
CHIP	Yes	1.12	.183	0.44	.513
	No	-0.43		-0.17	
Coronary heart disease	Yes	-0.61	.118	-0.42	.229
	No	0.57		0.46	
Cardiac insufficiency	Yes	0.12	.842	0.26	.822
	No	-0.08		-0.15	
Cardiac arrhythmia (including atrial fibrillation)	Yes	0.05	.645	0.54	.470
	No	-0.05		-0.55	
Cerebrovascular disease	Yes	-1.52	.094	-2.66	.005*
	No	0.33		0.59	
Peripheral artery disease	Yes	0.11	.778	0.01	.924
	No	-0.03		0.02	
Arterial Hypertension	Yes	0.01	.621	0.02	.983
	No	-0.07		0.05	
Type 2 diabetes mellitus	Yes	0.22	.833	0.43	.941
	No	-0.10		-0.17	
Hyperlipidemia	Yes	-0.02	.850	-0.00	.724
	No	0.01		0.05	
Obesity (BMI ≥30)	Yes	-0.26	.979	0.54	.460
	No	0.08		-0.15	
Hyperuricemia	Yes	3.09	.001*	3.42	< .001**
	No	-0.42		-0.47	
Kidney failure without dialysis	Yes	-0.06	.400	0.21	.564
	No	-0.64		-0.50	
End stage renal disease (ESRD)	Yes	3.90	< .001**	2.76	.018*
	No	-0.64		-0.50	
Chronic obstructive pulmonary disease	Yes	-0.72	.473	0.06	.703
	No	0.11		0.01	

Supplemental Table S2: Description of CHIP mutations of 106 individuals in our cohort as determined by Arends et al, Leukemia, 2018.

UPN	Gene_Name	CHROM	POS	REF	ALT	Annotation	HGVS.c	HGVS.p	Feature_ID	SDP	RD	AD	dbSNP	Validated	VAF
UPN058	*ABL1*	9	133748330	A	G	missense_variant	c.991A>G	p.(Asn331Asp)	ENST00000318560	3562	3086	367	rs139597295	Validated	0,103
UPN038	*ASXL1*	20	31023084	C	CTGCA	frameshift_elongation	c.2555_2558dup	p.(Gln853Hisfs*7)	ENST00000306058	2987	2768	125	.	Validated	0,042
UPN053	*ASXL1*	20	31022363	C	CTA	stop_gained	c.1833_1834insTA	p.(Ile612*)	ENST00000306058	874	666	35	.	Validated	0,04
UPN129	*ASXL1*	20	31022637	C	T	stop_gained	c.2107C>T	p.(Gln703*)	ENST00000306058	6930	6642	139	COSM1234988;COSM4424151	Validated	0,02
UPN143	*ASXL1*	20	31022441	A	AG	frameshift_variant	c.1919dup	p.(Gly641Trpfs*12)	ENST00000306058	1599	1055	298	COSM1411076;COSM4170082	Validated	0,186
UPN168	*ASXL1*	20	31022609	GC	G	frameshift_truncation	c.2081del	p.(Pro694Leufs*4)	ENST00000306058	1541	912	45	COSM1725000	Validated	0,029
UPN224	*ASXL1*	20	31022441	A	AG	frameshift_variant	c.1919dup	p.(Gly641Trpfs*12)	ENST00000306058	678	432	136	COSM1411076;COSM4170082	Validated	0,201
UPN260	*ASXL1*	20	31022402	TCACCACTGCCATAGAGAGGCGGC	T	frameshift_truncation	c.1885_1907del	p.(Glu630Argfs*15)	ENST00000306058	1784	1635	82	COSM3720455;COSM51200	Validated	0,046
UPN260	*ASXL1*	20	31022441	A	AG	frameshift_variant	c.1919dup	p.(Gly641Trpfs*12)	ENST00000306058	4129	2981	677	COSM1411076;COSM4170082	Validated	0,164
UPN291	*ASXL1*	20	31024072	CT	C	frameshift_truncation	c.3543del	p.(Thr1181Thrfs*31)	ENST00000306058	3886	3317	505	.	Validated	0,13
UPN337	*ASXL1*	20	31022592	C	T	stop_gained	c.2062C>T	p.(Arg688*)	ENST00000306058	1664	835	238	COSM4169684;COSM51388	Validated	0,143
UPN372	*ASXL1*	20	31022441	A	AG	frameshift_variant	c.1919dup	p.(Gly641Trpfs*12)	ENST00000306058	1351	927	228	COSM1411076;COSM4170082	Validated	0,169
UPN312	*BCOR*	X	39933036	A	T	missense_variant	c.1563T>A	p.(Asn521Lys)	ENST00000342274	3924	1937	1748	COSM5367252;COSM5367253	Validated	0,445
UPN259	*CBL*	11	119149245	T	C	missense_variant	c.1253T>C	p.(Phe418Ser)	ENST00000264033	1617	1517	80	COSM34070	Validated	0,049
UPN332	*CBL*	11	119149239	G	A	missense_variant	c.1247G>A	p.(Cys416Tyr)	ENST00000264033	986	883	80	COSM41789	Validated	0,081
UPN395	*CBL*	11	119148991	G	A	missense_variant	c.1211G>A	p.(Cys404Tyr)	ENST00000264033	2816	2499	210	rs192712314;COSM34068	Validated	0,075
UPN398	*CBLB*	3	105452852	C	T	splice_donor_variant, coding_transcript_intron_variant	c.1203+1G>A	p.(Gln401Splice)	ENST00000264122	647	586	22	.	Validated	0,034
UPN002	*DNMT3A*	2	25462068	A	G	missense_variant	c.2339T>C	p.(Ile780Thr)	ENST00000264709	1788	1709	75	COSM1583121;COSM4169938	Validated	0,042
UPN005	*DNMT3A*	2	25464450	C	T	missense_variant	c.2063G>A	p.(Arg688His)	ENST00000264709	922	742	150	COSM4169953;COSM4169954	Validated	0,163
UPN007	*DNMT3A*	2	25470002	A	C	missense_variant	c.1040T>G	p.(Leu347Arg)	ENST00000264709	424	396	15	.	Validated	0,035
UPN014	*DNMT3A*	2	25459804	C	T	splice_donor_variant, coding_transcript_intron_variant	c.2478+1G>A	p.(Lys826Splice)	ENST00000264709	2199	2123	76	.	Validated	0,035
UPN030	*DNMT3A*	2	25467083	G	A	stop_gained	c.1792C>T	p.(Arg598*)	ENST00000264709	4047	304	100	COSM133736	Validated	0,025
UPN030	*DNMT3A*	2	25470912	CT	C	frameshift_variant	c.848del	p.(Glu283Glyfs*33)	ENST00000264709	4302	3929	334		Validated	0,078
UPN039	*DNMT3A*	2	25457243	G	A	missense_variant	c.2644C>T	p.(Arg882Cys)	ENST00000264709	1129	691	22	COSM1166704;COSM53042	Validated	0,019
UPN061	*DNMT3A*	2	25457191	C	T	missense_variant	c.2696G>A	p.(Arg899His)	ENST00000264709	2213	2116	56	COSM1583134	Validated	0,025
UPN061	*DNMT3A*	2	25457242	C	T	missense_variant	c.2645G>A	p.(Arg882His)	ENST00000264709	4390	4143	135	rs147001633;COSM442676;COSM52944	Validated	0,031
UPN068	*DNMT3A*	2	25462068	A	G	missense_variant	c.2339T>C	p.(Ile780Thr)	ENST00000264709	2246	2070	46	COSM1583121;COSM4169938	Validated	0,02
UPN076	*DNMT3A*	2	25467083	G	A	stop_gained	c.1792C>T	p.(Arg598*)	ENST00000264709	779	84	23	COSM133736	Validated	0,03
UPN076	*DNMT3A*	2	25467198	GCAAAAGC	G	frameshift_truncation, splice_region_variant	c.1670_1676del	p.(Cys557Serfs*92)	ENST00000264709	793	717	44	.	Validated	0,055
UPN076	*DNMT3A*	2	25464544	C	T	missense_variant	c.1969G>A	p.(Val657Met)	ENST00000264709	1096	1011	28	.	Validated	0,026
UPN085	*DNMT3A*	2	25462077	G	C	missense_variant	c.2330C>G	p.(Pro777Arg)	ENST00000264709	649	621	25	.	Validated	0,039
UPN087	*DNMT3A*	2	25464556	A	C	missense_variant	c.1957T>G	p.(Leu653Val)	ENST00000264709	587	291	12	.	Validated	0,02
UPN099	*DNMT3A*	2	25469614	G	-	frameshift deletion	c.587del	p.(Pro196fs)	ENST00000380746	970	941	35	COSM1717669;COSM1717670	Validated	0,036
UPN106	*DNMT3A*	2	25468120	A	C	splice_donor_variant, coding_transcript_intron_variant	c.1554+2T>G	p.(Lys518Splice)	ENST00000264709	880	805	38	.	Validated	0,043
UPN129	*DNMT3A*	2	25463171	C	G	missense_variant, splice_region_variant	c.2322G>C	p.(Glu774Asp)	ENST00000264709	5729	4955	471	.	Validated	0,082
UPN148	*DNMT3A*	2	25468153	AG	A	frameshift_variant	c.1522del	p.(Leu508Serfs*143)	ENST00000264709	508	372	49	.	Validated	0,096
UPN163	*DNMT3A*	2	25463240	G	C	missense_variant	c.2253C>G	p.(Phe751Leu)	ENST00000264709	4488	4159	254	.	Validated	0,057
UPN165	*DNMT3A*	2	25470002	A	G	missense_variant	c.1040T>C	p.(Leu347Pro)	ENST00000264709	491	388	85	.	Validated	0,173
UPN166	*DNMT3A*	2	25457242	C	T	missense_variant	c.2645G>A	p.(Arg882His)	ENST00000264709	1780	921	28	rs147001633;COSM442676;COSM52944	Validated	0,016
UPN191	*DNMT3A*	2	25463184	G	A	missense_variant	c.2309C>T	p.(Ser770Leu)	ENST00000264709	2217	54	916	COSM231549;COSM3719403	Validated	0,413
UPN194	*DNMT3A*	2	25457243	G	A	missense_variant	c.2644C>T	p.(Arg882Cys)	ENST00000264709	2236	1240	41	COSM1166704;COSM53042	Validated	0,018
UPN196	*DNMT3A*	2	25470554	G	A	missense_variant	c.920C>T	p.(Pro307Leu)	ENST00000264709	982	949	24	.	Validated	0,024
UPN209	*DNMT3A*	2	25470028	C	T	splice_acceptor_variant, coding_transcript_intron_variant	c.1015-1G>A	p.(Val339Splice)	ENST00000264709	561	268	22	.	Validated	0,039
UPN209	*DNMT3A*	2	25457242	C	T	missense_variant	c.2645G>A	p.(Arg882His)	ENST00000264709	1168	526	22	rs147001633;COSM442676;COSM52944	Validated	0,019
UPN212	*DNMT3A*	2	25471039	T	TC	frameshift_variant	c.721dup	p.(Glu241Glyfs*12)	ENST00000264709	1228	997	138	.	Validated	0,112
UPN217	*DNMT3A*	2	25469937	T	A	missense_variant	c.1105A>T	p.(Ile369Phe)	ENST00000264709	503	415	69	.	Validated	0,137
UPN219	*DNMT3A*	2	25467061	A	G	missense_variant	c.1814T>C	p.(Leu605Pro)	ENST00000264709	3896	3624	167		Validated	0,043
UPN223	*DNMT3A*	2	25463235	CAGA	C	disruptive_inframe_deletion	c.2255_2257del	p.(Phe752del)	ENST00000264709	615	508	23	COSM133723;COSM5351731	Validated	0,037
UPN248	*DNMT3A*	2	25459821	T	C	missense_variant	c.2462A>G	p.(His821Arg)	ENST00000264709	2695	2608	76	.	Validated	0,028
UPN257	*DNMT3A*	2	25457242	C	T	missense_variant	c.2645G>A	p.(Arg882His)	ENST00000264709	1081	358	261	rs147001633;COSM442676;COSM52944	Validated	0,241
UPN257	*DNMT3A*	2	25457176	G	A	nonsynonymous SNV	c.2144C>T	p.(Pro715Leu)	ENST00000380746	572	45	43		Validated	0,075
UPN273	*DNMT3A*	2	25463308	G	A	missense_variant	c.2185C>T	p.(Arg729Trp)	ENST00000264709	762	707	14	COSM1318937;COSM249142	Validated	0,018
UPN278	*DNMT3A*	2	25457242	C	T	missense_variant	c.2645G>A	p.(Arg882His)	ENST00000264709	938	470	58	rs147001633;COSM442676;COSM52944	Validated	0,062
UPN292	*DNMT3A*	2	25457182	A	T	missense_variant	c.2705T>A	p.(Phe902Tyr)	ENST00000264709	264	202	28	.	Validated	0,106
UPN312	*DNMT3A*	2	25462006	T	C	missense_variant	c.2401A>G	p.(Met801Val)	ENST00000264709	525	397	112	.	Validated	0,213
UPN314	*DNMT3A*	2	25464543	A	G	missense_variant	c.1970T>C	p.(Val657Ala)	ENST00000264709	1400	951	263	.	Validated	0,188
UPN323	*DNMT3A*	2	25463289	T	G	missense_variant	c.2204A>C	p.(Tyr735Ser)	ENST00000264709	11159	10413	472	COSM4908593;COSM4908594	Validated	0,042
UPN326	*DNMT3A*	2	25463233	GC	G	frameshift_variant	c.2259del	p.(Trp753Cysfs*26)	ENST00000264709	1241	927	63	.	Validated	0,051
UPN328	*DNMT3A*	2	25467099	G	C	stop_gained	c.1776C>G	p.(Tyr592*)	ENST00000264709	131	26	44	COSM231573	Validated	0,336
UPN372	*DNMT3A*	2	25469932	G	T	stop_gained	c.1110C>A	p.(Tyr370*)	ENST00000264709	569	98	18	COSM2270959	Validated	0,032
UPN396	*DNMT3A*	2	25458593	C	T	stop_gained	c.2580G>A	p.(Trp860*)	ENST00000264709	6580	6045	135	COSM4169946;COSM4169947	Validated	0,021
UPN398	*DNMT3A*	2	25463508	C	T	splice_donor_variant, coding_transcript_intron_variant	c.2173+1G>A	p.(Glu725Splice)	ENST00000264709	884	786	24	.	Validated	0,027
UPN404	*DNMT3A*	2	25464552	C	T	missense_variant	c.1961G>A	p.(Gly654Asp)	ENST00000264709	1000	920	45	.	Validated	0,045
UPN406	*DNMT3A*	2	25457242	C	T	missense_variant	c.2645G>A	p.(Arg882His)	ENST00000264709	3437	1910	523	rs147001633;COSM442676;COSM52944	Validated	0,152
UPN407	*DNMT3A*	2	25457242	C	T	missense_variant	c.2645G>A	p.(Arg882His)	ENST00000264709	3297	1531	68	rs147001633;COSM442676;COSM52944	Validated	0,021
UPN408	*DNMT3A*	2	25457243	G	A	missense_variant	c.2644C>T	p.(Arg882Cys)	ENST00000264709	1459	746	47	COSM1166704;COSM53042	Validated	0,032
UPN413	*DNMT3A*	2	25464535	A	T	missense_variant	c.1978T>A	p.(Tyr660Asn)	ENST00000264709	1741	1363	42	.	Validated	0,024
UPN414	*DNMT3A*	2	25468159	T	TG	frameshift_variant	c.1516dup	p.(His506Profs*40)	ENST00000264709	2400	2207	75	.	Validated	0,031
UPN417	*DNMT3A*	2	25463286	C	T	missense_variant	c.2207G>A	p.(Arg736His)	ENST00000264709	3252	2096	72	rs139293773;COSM1318940;COSM133737	Validated	0,022
UPN418	*DNMT3A*	2	25457243	G	T	missense_variant	c.2644C>A	p.(Arg882Ser)	ENST00000264709	1380	738	38	COSM4383521;COSM87001	Validated	0,028
UPN420	*DNMT3A*	2	25462075	C	T	missense_variant	c.2332G>A	p.(Val778Met)	ENST00000264709	2483	1978	214	.	Validated	0,086
UPN432	*DNMT3A*	2	25462068	A	G	missense_variant	c.2339T>C	p.(Ile780Thr)	ENST00000264709	1497	1285	145	COSM1583121;COSM4169938	Validated	0,097
UPN300	*ETV6*	12	12037459	G	T	stop_gained	c.1090G>T	p.(Glu364*)	ENST00000396373	3032	2546	263	.	Validated	0,087
UPN041	*EZH2*	7	148516765	G	A	missense_variant	c.922C>T	p.(Pro308Ser)	ENST00000320356	407	379	18	.	Validated	0,044
UPN366	*EZH2*	7	148506443	C	T	missense_variant	c.2069G>A	p.(Arg690His)	ENST00000320356	2502	2418	65	COSM1319003;COSM52980	Validated	0,026
UPN423	*EZH2*	7	148523562	A	C	missense_variant	c.891T>G	p.(His297Gln)	ENST00000320356	5703	4330	1149	.	Validated	0,201
UPN341	*JAK2*	9	5073770	G	T	missense_variant	c.1849G>T	p.(Val617Phe)	ENST00000381652	2743	2286	43	rs77375493;COSM12600	Validated	0,016
UPN407	*JAK2*	9	5073770	G	T	missense_variant	c.1849G>T	p.(Val617Phe)	ENST00000381652	3024	2491	186	rs77375493;COSM12600	Validated	0,062
UPN246	*JAK3*	19	17947952	C	T	missense_variant	c.1772G>A	p.(Cys591Tyr)	ENST00000458235	84	58	26	.	Validated	0,31
UPN305	*NOTCH1*	9	139390641	G	C	missense_variant	c.7550C>G	p.(Pro2517Arg)	ENST00000277541	266	193	69	.	Validated	0,259
UPN332	*PHF6*	X	133527533	G	A	missense_variant, splice_region_variant	c.243G>A	p.(Met81Ile)	ENST00000332070	2020	1820	109	.	Validated	0,054
UPN072	*PPM1D*	17	58740674	G	GA	frameshift_variant	c.1582dup	p.(Arg528Lysfs*8)	ENST00000305921	4507	2493	203	.	Validated	0,045
UPN202	*PPM1D*	17	58740521	GA	G	frameshift_truncation	c.1430del	p.(Asn477Ilefs*6)	ENST00000305921	2698	2491	54	.	Validated	0,02

UPN407	*PPM1D*	17	58740611	ACTGTCATGGACCAAAAAAAT	A	frameshift_truncation	c.1517_1536del	p.(Thr506Ilefs*15)	ENST00000305921	3829	3199	432	.	Validated	0,113
UPN414	*PPM1D*	17	58740809	C	T	stop_gained	c.1714C>T	p.(Arg572*)	ENST00000305921	4651	3009	112	.	Validated	0,024
UPN075	*RAD21*	8	117864840	TG	T	frameshift_variant	c.1268del	p.(Pro423Glnfs*33)	ENST00000297338	486	457	15	.	Validated	0,031
UPN304	*RAD21*	8	117859882	A	G	missense_variant	c.1753T>C	p.(Cys585Arg)	ENST00000297338	2274	2139	94	.	Validated	0,041
UPN399	*RAD21*	8	117861221	C	T	stop_gained	c.1668G>A	p.(Trp556*)	ENST00000297338	610	572	18	.	Validated	0,03
UPN434	*RAD21*	8	117868517	A	AG	stop_gained	c.824dup	p.(Asp276*)	ENST00000297338	794	665	36	.	Validated	0,045
UPN080	*SF3B1*	2	198267360	T	A	missense_variant	c.1997A>T	p.(Lys666Met)	ENST00000335508	4645	3743	732	COSM110698	Validated	0,158
UPN206	*SF3B1*	2	198266834	T	C	missense_variant	c.2098A>G	p.(Lys700Glu)	ENST00000335508	1306	948	153	COSM84677	Validated	0,117
UPN264	*SF3B1*	2	198266575	A	G	missense_variant	c.2261T>C	p.(Ile754Thr)	ENST00000335508	1080	991	66	.	Validated	0,061
UPN328	*SF3B1*	2	198266834	T	C	missense_variant	c.2098A>G	p.(Lys700Glu)	ENST00000335508	271	132	127	COSM84677	Validated	0,469
UPN341	*SF3B1*	2	198266713	C	T	missense_variant	c.2219G>A	p.(Gly740Glu)	ENST00000335508	2248	1881	93	COSM133120	Validated	0,041
UPN371	*SF3B1*	2	198267359	C	G	missense_variant	c.1998G>C	p.(Lys666Asn)	ENST00000335508	1140	1086	18	COSM132937	Validated	0,016
UPN401	*SF3B1*	2	198266834	T	C	missense_variant	c.2098A>G	p.(Lys700Glu)	ENST00000335508	1188	1116	40	COSM84677	Validated	0,034
UPN421	*SF3B1*	2	198267360	T	C	missense_variant	c.1997A>G	p.(Lys666Arg)	ENST00000335508	997	669	283	COSM131553	Validated	0,284
UPN046	*SRSF2*	17	74732959	G	A	missense_variant	c.284C>T	p.(Pro95Leu)	ENST00000359995	370	181	104	COSM146288;COSM146290;COSM211028;COSM211506	Validated	0,281
UPN164	*SRSF2*	17	74732959	G	C	missense_variant	c.284C>G	p.(Pro95Arg)	ENST00000359995	379	186	145	COSM146290;COSM211661;COSM4385016	Validated	0,383
UPN194	*STAG2*	X	123156506	A	AT	stop_gained	c.33dup	p.(Asn12*)	ENST00000218089	2510	2118	131	.	Validated	0,052
UPN046	*TET2*	4	106196457	TC	T	frameshift_truncation	c.4854del	p.(Phe1618Phefs*13)	ENST00000513237	1129	370	746	.	Validated	0,661
UPN047	*TET2*	4	106193748	C	T	stop_gained	c.4210C>T	p.(Arg1404*)	ENST00000380013	1757	1673	49	COSM42037	Validated	0,028
UPN054	*TET2*	4	106182915	G	A	splice_acceptor_variant, 3_prime_utr_variant	c.*279-1G>A	p.(Glu1319Splice)	ENST00000265149	4318	3321	851	.	Validated	0,197
UPN058	*TET2*	4	106157282	CA	C	frameshift_truncation	c.2184del	p.(Ala728Alafs*23)	ENST00000305737	1009	863	122	.	Validated	0,121
UPN060	*TET2*	4	106196267	C	T	stop_gained	c.4600C>T	p.(Gln1534*)	ENST00000380013	446	242	179	COSM211735	Validated	0,401
UPN060	*TET2*	4	106197057	T	A	stop_gained	c.5390T>A	p.(Leu1797*)	ENST00000380013	2597	2400	104	.	Validated	0,04
UPN067	*TET2*	4	106196331	AGTCT	A	frameshift_truncation	c.4668_4671del	p.(Val1557Thrfs*13)	ENST00000380013	1102	878	159	.	Validated	0,144
UPN071	*TET2*	4	106155764	A	G	missense_variant	c.665A>G	p.(His222Arg)	ENST00000265149	12921	11752	1010	.	Validated	0,078
UPN084	*TET2*	4	106157348	TAAAG	T	frameshift_truncation	c.2252_2255del	p.(Lys751Ilefs*61)	ENST00000265149	1377	936	295	COSM4767352	Validated	0,214
UPN097	*TET2*	4	106196561	C	T	stop_gained	c.4894C>T	p.(Gln1632*)	ENST00000380013	3259	2739	103	COSM3719314	Validated	0,032
UPN122	*TET2*	4	106164933	AGAG	A	splice_donor_variant, 3_prime_utr_variant	c.*126_*127+1del	p.(Glu1268Splice)	ENST00000265149	512	473	30	.	Validated	0,059
UPN161	*TET2*	4	106156417	C	T	stop_gained	c.1318C>T	p.(Gln440*)	ENST00000265149	1235	1166	40	COSM211610	Validated	0,032
UPN161	*TET2*	4	106156423	AAC	A	frameshift_truncation	c.1328_1329del	p.(Thr443Asnfs*11)	ENST00000265149	2488	2209	159	.	Validated	0,064
UPN184	*TET2*	4	106196741	A	T	stop_gained	c.5074A>T	p.(Lys1692*)	ENST00000380013	2008	1537	357	.	Validated	0,178
UPN209	*TET2*	4	106190858	C	T	missense_variant	c.4136C>T	p.(Ala1379Val)	ENST00000380013	1547	1236	180	COSM4383940	Validated	0,116
UPN215	*TET2*	4	106164913	C	T	missense_variant	c.3781C>T	p.(Arg1261Cys)	ENST00000380013	1535	267	26	COSM87130	Validated	0,017
UPN242	*TET2*	4	106158349	C	T	stop_gained	c.3250C>T	p.(Gln1084*)	ENST00000265149	680	460	112	.	Validated	0,165
UPN242	*TET2*	4	106157467	CA	C	frameshift_truncation	c.2369del	p.(Gln790Argfs*23)	ENST00000305737	2092	1489	368	.	Validated	0,176
UPN243	*TET2*	4	106193892	C	T	stop_gained	c.4354C>T	p.(Arg1452*)	ENST00000380013	1275	320	105	COSM41706	Validated	0,082
UPN243	*TET2*	4	106156097	C	T	missense_variant	c.998C>T	p.(Pro333Leu)	ENST00000265149	5338	4919	197	.	Validated	0,037
UPN257	*TET2*	4	106157591	AG	A	frameshift_truncation	c.2494del	p.(Val832Phefs*9)	ENST00000305737	1705	1410	75	.	Validated	0,044
UPN260	*TET2*	4	106157407	C	T	stop_gained	c.2308C>T	p.(Gln770*)	ENST00000265149	11243	9746	1210	.	Validated	0,108
UPN265	*TET2*	4	106190906	T	G	splice_donor_variant, 3_prime_utr_variant	c.*506+2T>G	p.(Leu1394Splice)	ENST00000265149	620	411	186	.	Validated	0,3
UPN270	*TET2*	4	106197379	T	G	missense_variant	c.5712T>G	p.(His1904Gln)	ENST00000380013	2267	2056	86	.	Validated	0,038
UPN275	*TET2*	4	106164930	T	G	missense_variant	c.3798T>G	p.(Asn1266Lys)	ENST00000380013	1051	882	93	.	Validated	0,088
UPN292	*TET2*	4	106190882	A	G	missense_variant	c.4160A>G	p.(Asn1387Ser)	ENST00000380013	624	557	45	COSM4766124	Validated	0,072
UPN314	*TET2*	4	106157162	AT	A	frameshift_truncation	c.2065del	p.(Ser689Profs*11)	ENST00000305737	4659	4116	353	.	Validated	0,076
UPN338	*TET2*	4	106197276	C	A	stop_gained	c.5609C>A	p.(Ser1870*)	ENST00000380013	2289	1980	53	.	Validated	0,023
UPN372	*TET2*	4	106164065	G	T	missense_variant	c.3484G>T	p.(Asp1162Tyr)	ENST00000265149	5753	5503	138	COSM211672	Validated	0,024
UPN372	*TET2*	4	106158124	C	T	stop_gained	c.3025C>T	p.(Gln1009*)	ENST00000265149	6397	5962	264	.	Validated	0,041
UPN395	*TET2*	4	106197315	C	T	missense_variant	c.5648C>T	p.(Thr1883Ile)	ENST00000380013	4414	3179	1153	COSM211669	Validated	0,261
UPN406	*TET2*	4	106155811	GT	G	frameshift_truncation	c.715del	p.(Ser239Profs*11)	ENST00000305737	12123	10990	386	.	Validated	0,032
UPN414	*TET2*	4	106155748	TC	T	frameshift_truncation	c.651del	p.(Ser217Serfs*33)	ENST00000305737	5777	5236	283	COSM3718981;COSM3718982	Validated	0,049
UPN417	*TET2*	4	106158472	A	T	stop_gained	c.3373A>T	p.(Lys1125*)	ENST00000265149	1285	1112	68	.	Validated	0,053
UPN039	*TP53*	17	7577082	C	T	missense_variant	c.856G>A	p.(Glu286Lys)	ENST00000269305	869	713	116	COSM10726;COSM1645467;COSM3522693;COSM99924	Validated	0,133
UPN046	*TP53*	17	7577580	T	C	missense_variant	c.701A>G	p.(Tyr234Cys)	ENST00000269305	4477	3577	632	COSM10725;COSM1646849;COSM165072;COSM165073;COSM165074;COSM3388193	Validated	0,141
UPN052	*TP53*	17	7577548	C	A	missense_variant	c.733G>T	p.(Gly245Cys)	ENST00000269305	10064	9030	301	COSM11081;COSM1646855;COSM3388190;COSM562651;COSM562652;COSM562653	Validated	0,03
UPN104	*TP53*	17	7577121	G	T	missense_variant	c.817C>A	p.(Arg273Ser)	ENST00000269305	1957	830	91	rs121913343;COSM3958801;COSM3958802;COSM417971;COSM43909	Validated	0,046
UPN216	*TP53*	17	7578454	G	T	missense_variant	c.476C>A	p.(Ala159Asp)	ENST00000269305	2394	2241	79	COSM11496;COSM2744894;COSM2744895;COSM2744896;COSM2744897;COSM2744898;COSM4271942	Validated	0,033
UPN243	*TP53*	17	7578427	T	C	missense_variant	c.503A>G	p.(His168Arg)	ENST00000269305	873	744	57	COSM3388206;COSM3388207;COSM3388208;COSM3388209;COSM3388210;COSM3388211;COSM43545	Validated	0,065
UPN381	*TP53*	17	7577548	C	T	missense_variant	c.733G>A	p.(Gly245Ser)	ENST00000269305	3655	1955	356	COSM121035;COSM121036;COSM121037;COSM1640833;COSM3356965;COSM6932	Validated	0,097
UPN011	*U2AF1*	21	44514777	T	C	missense_variant	c.470A>G	p.(Gln157Arg)	ENST00000291552	555	531	19	COSM1724986;COSM211532	Validated	0,034
UPN186	*U2AF1*	21	44524456	G	A	missense_variant	c.101C>T	p.(Ser34Phe)	ENST00000291552	6054	4745	814	COSM1142948;COSM166866	Validated	0,134
UPN095	*ZRSR2*	X	15833949	TC	T	frameshift_truncation	c.709del	p.(Leu237fs)	ENST00000307771	915	819	40	.	Validated	0,044
UPN260	*ZRSR2*	X	15841025	AC	A	frameshift_truncation	c.1110del	p.(His370Glnfs*?)	ENST00000307771	2931	2760	109	.	Validated	0,037