

**Appendix 1: Consent form for UK study**

**Version 1 (November 2010)**

**Genetic and Endoscopic studies of Duodenal Polyposis in  
Familial Adenomatous Polyposis and MUTYH-Associated  
Polyposis**

**CONSENT FOR PARTICIPATION IN STUDY**

**RE: Patients name, address and date of birth**

Thank you for reading the information sheet about our research study. If you agree to participate, please initial the boxes below and sign this form.

Name of researchers:           Dr Sunil Dolwani  
  Consultant Gastroenterologist

Professor Julian Sampson  
Professor in Medical Genetics

Dr Joanna Hurley  
Research Registrar

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**Please read each section carefully (Please put your initials in those boxes you agree to and sign at the bottom of the letter where indicated)**

I confirm that I have read and understand the information sheet dated 23/11/10 (version 1) for this study. I have had the opportunity to consider the information, ask questions and have had these questions answered satisfactorily.

I agree to take part in this study and hereby give express consent for my medical records to be reviewed by the medical researchers involved in the study for the specific purposes of this research.

I agree to take part in this study and agree that biopsies can be taken during my surveillance upper gastrointestinal endoscopy for genetic analysis, and that my duodenum can be sprayed with dye to look for polyps. I also consent to a blood sample being taken for genetic analysis.

I consent to my GP being informed about my participation in the study.

I consent to the recording of data, including photographs and video recordings from this and future surveillance upper gastrointestinal endoscopies which will be securely stored in the Institute of Medical Genetics, Cardiff.

I understand that any information about myself will remain confidential and that at any point I am free to withdraw myself from the study without giving any reason and without this affecting my future treatment or standard of care or legal rights.

In the unlikely event that I lose the capacity to make decisions during the study period, I agree that any data collected up to this point may be included in the study.

Are you happy to be contacted by telephone if the researcher wishes to clarify any information you have given?

Yes

No

If yes, please provide a telephone number: \_\_\_\_\_

If you have preferred times to be contacted, please state below:

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SIGNED: \_\_\_\_\_ (patient)

DATE OF BIRTH:

NAME:

DATE:

**Appendix 2: Copy of data sheet used for European MAP cross-sectional study**

**Data to be collected at recruitment**

**Patient Number**

**DOB**

**Sex**

**MUTYH Mutations**

**Date and number of adenomas at first colonoscopy**

**Colorectal cancer?**

**History of other cancer (if yes date of diagnosis and type)**

**Date of first screening upper GI endoscopy prior**

**Date of most recent screening upper GI endoscopy (OGD))**

**Total number of screening upper GI endoscopies undertaken to date**

**Number of duodenal polyps identified**

	1 <sup>st</sup> OGD	2 <sup>nd</sup> OGD	3 <sup>rd</sup> OGD
Histology			
Dysplasia			
Size			
Number			

	4th OGD	5th OGD	6th OGD
Histology			
Dysplasia			
Size			
Number			

**Spigelman grade at last upper GI endoscopy**

**Location of duodenal polyps**

**Any treatment given (endoscopic/ chemoprevention)**



**Appendix 4 – Final validated SNVs from adenomas that underwent whole exome sequencing**

Adenoma	FAP/MAP	chr	pos	ref	alt	gene id	dbSNP	MAF (1000 Genomes)
17A1	FAP	chr1	202935701	G	A	CYB5R1	rs145377151	N/A
		chr1	227198625	G	A	CDC42BPA		
		chr2	112786191	C	G	MERTK		
		chr3	9799379	C	G	CAMK1		
		chr3	42445542	C	A	LYZL4		
		chr3	73006483	T	C	GXYLT2		
		chr4	44688640	G	A	GUF1		
		chr7	148801578	C	T	ZNF425		
		chr8	28929820	A	C	KIF13B	rs202077289	N/A
		chr8	113651035	G	T	CSMD3		
		chr9	121930039	A	C	DBC1		

		chr11	6790029	G	A	OR2AG2		
		chr11	121477556	C	G	SORL1		
		chr13	46287831	C	T	SPERT		
		chr15	54307060	C	G	UNC13C		
		chr15	76430185	C	T	C15orf27		
		chr15	84694001	G	A	ADAMTSL3		
		chr17	7468822	G	A	SENP3		
		chr17	19643657	C	T	ALDH3A1		
		chr19	52220394	C	T	HAS1	rs75142551	T=0.0010/5
		chrX	117722427	G	A	DOCK11	rs191675930	A=0.0008/3
17A2	FAP	chr1	27332785	A	G	FAM46B		
		chr1	37267622	C	A	GRIK3		
		chr1	71873218	C	T	NEGR1	rs374884396	
		chr1	115486972	G	C	SYCP1		
		chr1	176012868	C	T	RFWD2		



		chr1	222837428	G	T	MIA3		
		chr2	107423244	G	A	ST6GAL2		
		chr2	215914442	A	T	ABCA12		
		chr3	130284143	C	T	COL6A6	rs201280240	T=0.0002/1
		chr3	137880945	G	C	DBR1		
		chr3	140281731	C	T	CLSTN2		
		chr3	156979089	C	T	VEPH1	rs146047352	T=0.0008/4
		chr4	862363	C	A	GAK	rs34585705	A=0.0038/19
		chr4	1805521	A	G	FGFR3		
		chr4	114195608	G	C	ANK2		
		chr5	24498607	C	A	CDH10		
		chr5	169135249	C	T	DOCK2		
		chr5	176295947	G	A	UNC5A		
		chr6	26107730	C	A	HIST1H1T		
		chr8	67089250	C	G	CRH		

		chr8	67344765	C	T	ADHFE1	rs139418895	T=0.0034/17
		chr11	6023702	C	G	OR56A4		
		chr11	56086143	G	T	OR8K3		
		chr11	66639294	C	T	PC		
		chr11	111941380	T	A	PIH1D2		
		chr12	10573064	C	G	KLRC3		
		chr12	75824503	G	T	GLIPR1L2		
		chr12	101598312	C	T	SLC5A8		
		chr12	131488782	G	A	GPR133		
		chr14	47426751	G	A	MDGA2		
		chr14	69703138	G	C	EXD2		
		chr15	59344571	A	C	RNF111		
		chr16	50745411	C	T	NOD2		
		chr17	26890540	T	C	PIGS		
		chr18	44229218	T	C	LOXHD1		

		chr19	46998329	C	T	BC132841,PNMAL2		
		chr22	43607030	C	T	SCUBE1	rs376217649	N/A
		chrX	50121586	C	T	DGKK		
		chrX	107084146	C	T	MID2		
		chrX	122551704	T	G	GRIA3		
		chr2	198949617	G	A	PLCL1		
30A1	FAP	chr1	38261504	C	T	MANEAL		
		chr1	76343985	A	T	MSH4		
		chr1	223947026	G	A	CAPN2	rs370722848	N/A
		chr2	112813190	G	C	TMEM87B	rs145486099	C=0.0080/40
		chr3	50597146	G	T	C3orf18		
		chr6	35445142	G	A	TEAD3		
		chr6	110048344	G	T	FIG4		
		chr8	54793599	G	T	RGS20		
		chr8	100523591	C	G	VPS13B		

		chr12	70724100	G	A	CNOT2		
		chr13	109792825	C	T	MYO16	rs199777754	T=0.0058/29
		chr15	26825594	G	A	GABRB3		
		chr19	860911	C	A	CFD		
		chrX	17394332	A	T	NHS		
		chrX	18259467	C	G	SCML2		
		chrX	54783934	G	T	ITIH6		
		chr1	17033805	C	T	ESPNP	rs59259153	N/A
30A3	FAP	chr1	63003665	C	T	DOCK7		
		chr1	175092655	G	A	TNN		
		chr2	98354302	T	C	ZAP70		
		chr2	212251724	C	T	ERBB4		
		chr3	130884328	C	T	NEK11	rs142330323	T=0.0002/1
		chr4	2065835	T	A	NAT8L		
		chr5	11111073	G	A	CTNND2		

		chr5	45645523	C	A	HCN1		
		chr5	73128174	G	A	ARHGEF28		
		chr8	3045465	G	A	CSMD1		
		chr8	30704222	G	T	TEX15		
		chr9	95374893	C	T	CENPP		
		chr11	376478	C	T	B4GALNT4	rs200391187	T=0.0002/1
		chr12	48377880	G	A	COL2A1		
		chr12	52914023	C	T	KRT5		
		chr13	95055367	C	A	GPC6		
		chr16	3254376	C	T	OR1F1		
		chr16	76532537	C	T	CNTNAP4		
		chr17	8736323	C	T	PIK3R6		
		chr18	909467	C	T	ADCYAP1		
		chr19	47912430	G	A	MEIS3		
		chr19	51526383	C	A	KLK11		

		chr21	42773945	G	A	MX2	rs143535963	N/A
		chrX	15343189	C	T	PIGA		
		chrX	40450529	G	A	ATP6AP2		
		chr1	17033805	C	T	ESPNP	rs59259153	N/A
		chr6	152697533	T	C	SYNE1		
		chr15	31327754	G	A	TRPM1		
		chr19	10112318	T	G	COL5A3		
51A1	FAP	chr1	17264905	G	A	CROCC		
		chr1	177249966	C	T	FAM5B		
		chr1	202104298	C	A	ARL8A		
		chr1	228210597	G	A	WNT3A		
		chr1	247978707	C	G	OR14A16		
		chr2	237300651	G	A	IQCA1		
		chr4	147724791	G	T	TTC29		
		chr5	15928449	T	C	FBXL7		

		chr5	55204257	G	A	IL31RA	rs118134673	A=0.0002/1
		chr5	61659005	G	A	KIF2A		
		chr7	107756499	T	C	LAMB4		
		chr8	100847808	G	A	VPS13B		
		chr8	139790604	C	T	COL22A1		
		chr9	94123914	G	C	AUH		
		chr10	117486773	C	T	ATRNL1		
		chr11	123753862	C	T	TMEM225		
		chr11	123887117	C	T	OR10G4	rs201358968	T=0.0004/2
		chr12	3757762	G	A	EFCAB4B	rs372821272	N/A
		chr12	56812002	C	T	TIMELESS		
		chr15	72582309	G	A	CELF6		
		chr17	51901040	G	A	KIF2B		
		chr19	501725	G	A	MADCAM1	rs62130833	N/A
		chr19	3964709	C	T	DAPK3		

		chr19	9070042	C	T	MUC16		
		chr19	14582538	T	C	PKN1		
		chr19	52869823	A	C	ZNF610		
		chr19	57641025	C	T	USP29		
		chrX	37431151	C	T	LANCL3		
		chr2	198949560	G	A	PLCL1		
		chr4	155156598	G	A	DCHS2	rs149548848	A=0.0010/5
		chr4	155158065	C	T	DCHS2	rs376721416	N/A
		chr5	13735384	C	T	DNAH5		
51A3	FAP	chr1	1168084	G	A	B3GALT6		
		chr1	1420445	C	T	ATAD3B		
		chr1	213224822	G	A	RPS6KC1		
		chr2	190626303	A	G	OSGEPL1		
		chr2	233527525	C	T	EFHD1		
		chr6	36988357	T	C	FGD2		



		chr15	88678509	G	A	NTRK3	rs373935634	A=0.0002/1
		chr16	19659171	C	G	C16orf62		
		chr17	25904707	C	T	KSR1		
		chr21	31768834	G	A	KRTAP13-1	rs374257240	N/A
		chrX	5947444	C	T	NLGN4X		
		chrX	153055188	G	A	IDH3G		
51A4	FAP	chr4	159091771	C	T	FAM198B		
		chr15	72581271	G	T	CELF6	rs201772134	T=0.0002/1
52A5	FAP	chr2	233274476	G	C	ALPPL2	rs61730278	N/A
		chr8	70981888	G	A	PRDM14		
		chr19	46388939	C	T	IRF2BP1		
		chrX	38176610	G	A	RPGR		
		chr1	201181973	C	T	IGFN1	rs201190585	T=0.0020/10
		chr2	220500412	G	A	SLC4A3	rs55910611	A=0.0018/9
52A3	FAP	chr1	26608879	C	T	UBXN11	rs1134581	N/A

		chr2	39241117	C	G	SOS1		
		chr2	170127486	C	T	LRP2		
		chr2	189859787	C	T	COL3A1		
		chr4	55968633	G	A	KDR	rs200338299	A=0.0002/1
		chr5	178566909	C	T	ADAMTS2		
		chr6	160499255	C	T	IGF2R		
		chr7	8062176	G	T	GLCCI1		
		chr7	33376157	G	A	BBS9		
		chr7	150094095	C	T	ZNF775		
		chr8	23150851	C	T	R3HCC1	rs76824703	T=0.0040/20
		chr10	88651951	T	C	BMPR1A		
		chr12	53586649	C	T	ITGB7	rs139299757	N/A
		chr12	111748088	C	T	CUX2		
		chr17	10300215	G	A	MYH8		
		chr19	3011075	C	T	TLE2		

		chr19	5208015	C	T	PTPRS		
		chr19	7542168	G	A	PEX11G	rs11668511	A=0.0102/51
		chr19	11510906	G	A	RGL3	rs189304178	A=0.0002/1
		chr19	14093025	G	A	RFX1		
		chr19	52327635	G	A	FPR3		
		chr20	21376602	C	A	NKX2-4		
		chr8	70981888	G	A	PRDM14		
		chr2	220500412	G	A	SLC4A3	rs55910611	A=0.0018/9
		chr1	201181973	C	T	IGFN1	rs201190585	T=0.0020/10
		chr10	50085126	T	A	WDFY4		
52A4	FAP	chr2	48925824	C	A	LHCGR		
		chr2	164467539	G	A	FIGN		
		chr2	209307167	C	A	PTH2R		
		chr3	196669334	T	C	NCBP2		
		chr4	57907045	A	C	IGFBP7		

		chr5	19473718	C	T	CDH18		
		chr5	80641775	C	G	ACOT12		
		chr5	127641274	A	G	FBN2		
		chr7	81588668	C	T	CACNA2D1		
		chr10	48388432	C	T	RBP3		
		chr10	70645503	C	T	STOX1		
		chr11	1262927	G	A	MUC5B		
		chr11	46401425	G	T	DGKZ		
		chr12	50191059	C	A	NCKAP5L		
		chr12	68708950	G	A	MDM1		
		chr12	110777196	G	C	ATP2A2		
		chr12	117612030	G	A	FBXO21		
		chr13	106124979	C	A	DAOA		
		chr15	68061949	G	A	MAP2K5		
		chr17	4802378	G	A	CHRNE		

		chr18	25583041	T	A	CDH2		
		chr18	64172201	A	C	CDH19		
		chr19	1754830	G	A	ONECUT3		
		chr19	53219140	C	T	ZNF611	rs146379839	T=0.0010/5
		chr20	20491909	G	C	RALGAPA2		
		chrX	70777499	C	G	OGT		
		chrX	83128633	C	A	CYLC1		
		chr1	201181973	C	T	IGFN1	rs201190585	T=0.0020/10
		chr2	220500412	G	A	SLC4A3	rs55910611	A=0.0018/9
		chr12	25398284	C	T	KRAS	rs121913529	N/A
		chr12	56487261	C	G	ERBB3		
24A1	MAP	chr1	214557228	G	A	PTPN14		
		chr3	42727966	G	T	KLHL40		
		chr3	51746990	G	T	GRM2		
		chr3	97983984	C	A	OR5H6		

		chr3	148600314	G	A	CPA3	rs374150898	A=0.0004/2
		chr3	184090393	G	T	THPO		
		chr7	47855037	C	A	PKD1L1		
		chr8	56912020	C	A	LYN		
		chr11	106849411	C	A	GUCY1A2		
		chr11	109294833	C	A	C11orf87		
		chr12	64824030	C	A	XPOT		
		chr14	104053651	C	A	APOPT1,KLC1		
		chr15	43818663	G	T	MAP1A		
		chr17	648181	G	T	GEMIN4		
		chr17	7330642	G	T	C17orf74		
		chr17	39659547	G	T	KRT13		
		chr19	36673975	C	T	ZNF565	rs143326743	N/A
		chr19	56688493	G	A	GALP	rs368200734	N/A
		chrX	78618532	G	T	ITM2A		

		chrX	83724189	C	A	HDX		
		chrX	86890607	C	A	KLHL4		
		chrX	102977169	G	T	GLRA4		
		chrX	114141413	C	T	HTR2C		
24A3	MAP	chr1	1278080	C	T	DVL1		
		chr1	16260642	A	C	SPEN		
		chr1	100921035	C	A	CDC14A		
		chr1	115829345	G	T	NGF		
		chr1	181701555	G	T	CACNA1E		
		chr3	52239934	G	C	ALAS1		
		chr3	52850905	C	A	ITIH4		
		chr5	9066662	G	T	SEMA5A		
		chr5	43245895	G	C	NIM1		
		chr5	140176831	G	T	PCDHA2		
		chr6	66042255	T	C	EYS		

		chr6	88074900	G	A	C6orf163		
		chr6	109820307	C	G	AK9		
		chr7	24873944	C	A	OSBPL3		
		chr7	82585018	C	G	PCLO		
		chr7	98527627	C	A	TRRAP		
		chr7	138269511	G	T	TRIM24		
		chr8	67064824	C	G	TRIM55		
		chr9	35674209	G	T	CA9		
		chr10	43608383	C	A	RET		
		chr12	57963112	C	T	KIF5A		
		chr12	66725216	C	A	HELB		
		chr13	36401834	C	T	DCLK1	rs377548672	N/A
		chr16	70778426	C	A	VAC14		
		chr17	40328084	G	T	KCNH4		
		chr17	55927361	C	A	MRPS23		



		chr17	61895483	G	A	DDX42		
		chr18	3119921	G	A	MYOM1		
		chr19	56481980	C	A	NLRP8		
		chr21	42080436	C	A	DSCAM		
		chrX	134494603	C	T	ZNF449		
		chr2	141298667	C	T	LRP1B		
		chr12	25398285	C	T	KRAS	rs121913530	N/A
		chr12	49420688	G	A	KMT2D		
		chr12	56480320	C	A	ERBB3		
		chr16	11362742	G	T	TNP2		
		chr17	7661866	G	A	DNAH2		
		chr17	73482483	C	T	KIAA0195		
		chrX	70514194	C	A	NONO		
24A8	MAP	chr2	141298667	C	T	LRP1B		
		chr6	112461982	C	A	LAMA4		

		chr12	25398285	C	T	KRAS	rs121913530	N/A
		chr12	49420688	G	A	KMT2D		
		chr12	56480320	C	A	ERBB3		
		chr16	11362742	G	T	TNP2		
		chr17	7661866	G	A	DNAH2		
		chr4	155254146	C	T	DCHS2		
		chr1	1114694	G	T	TTLL10		
		chr1	16377088	C	A	CLCNKB	rs121909134	N/A
		chr1	87026036	C	A	CLCA4		
		chr1	205073128	G	A	RBBP5		
		chr1	247016440	C	A	AHCTF1		
		chr2	69174379	G	T	GKN2		
		chr2	207174861	C	T	ZDBF2	rs199996175	T=0.0002/1
		chr2	220166889	C	A	PTPRN		
		chr2	231973464	C	A	HTR2B		

		chr3	35729253	C	A	ARPP21		
		chr3	64619440	C	A	ADAMTS9		
		chr3	121340879	G	T	FBXO40		
		chr3	164741485	G	T	SI		
		chr3	179537722	C	A	PEX5L		
		chr4	68691492	C	A	TMPRSS11D		
		chr4	79359734	C	A	FRAS1		
		chr5	38869192	C	A	OSMR		
		chr5	56178583	G	T	MAP3K1		
		chr5	159992611	G	T	ATP10B		
		chr6	82459587	G	T	FAM46A		
		chr6	142718769	C	A	GPR126		
		chr7	50097729	G	A	ZPBP		
		chr7	143080043	G	C	ZYX		
		chr8	41166412	C	A	SFRP1		

		chr9	13158069	C	A	MPDZ		
		chr9	80869825	C	A	CEP78		
		chr9	135865140	C	A	GFI1B		
		chr10	7621949	C	T	ITIH5	rs368004189	N/A
		chr10	105792474	G	T	COL17A1		
		chr11	2940637	G	T	SLC22A18		
		chr11	4903600	C	A	OR51T1		
		chr11	5363851	G	T	OR51B5		
		chr11	26681887	C	T	ANO3	rs199891439	T=0.0002/1
		chr11	64012422	C	G	PPP1R14B		
		chr11	71630023	C	G	LOC100133315		
		chr11	86126200	G	T	CCDC81		
		chr13	36828280	C	A	CCDC169,CCDC169-SOHLH2		
		chr13	41705386	C	A	KBTBD6		
		chr13	114792920	G	A	RASA3	rs181099150	A=0.0002/1

		chr14	94780503	C	A	SERPINA6		
		chr14	99932131	C	G	SETD3		
		chr16	84215016	G	A	TAF1C	rs4150151	N/A
		chr17	43005745	G	A	KIF18B		
		chr17	76476794	C	A	DNAH17		
		chr19	9058088	C	G	MUC16		
		chr19	33292759	C	A	TDRD12		
		chr19	54139996	G	T	DPRX		
		chr20	33330856	C	A	NCOA6		
		chr20	40790097	G	T	PTPRT		
		chrX	114425545	G	A	RBMXL3		
		chr1	1278080	C	T	DVL1		
		chr1	16260642	A	C	SPEN		
		chr1	100921035	C	A	CDC14A		
		chr3	52239934	G	C	ALAS1		

		chr3	52850905	C	A	ITIH4		
		chr5	43245895	G	C	NIM1		
		chr6	66042255	T	C	EYS		
		chr6	88074900	G	A	C6orf163		
		chr6	109820307	C	G	AK9		
		chr7	24873944	C	A	OSBPL3		
		chr7	82585018	C	G	PCLO		
		chr7	98527627	C	A	TRRAP		
		chr7	138269511	G	T	TRIM24		
		chr8	67064824	C	G	TRIM55		
		chr12	57963112	C	T	KIF5A		
		chr12	66725216	C	A	HELB		
		chr13	36401834	C	T	DCLK1	rs377548672	N/A
		chr16	70778426	C	A	VAC14		
		chr17	40328084	G	T	KCNH4		

		chr17	61895483	G	A	DDX42		
		chr19	56481980	C	A	NLRP8		
		chr21	42080436	C	A	DSCAM		
37A1	MAP	chr1	19632610	C	A	AKR7A2		
		chr1	21212862	C	A	EIF4G3		
		chr1	22923873	G	T	EPHA8		
		chr1	29139032	T	A	OPRD1		
		chr1	68943547	C	A	DEPDC1		
		chr1	182856484	G	T	DHX9		
		chr1	214542845	C	A	PTPN14		
		chr1	221875916	C	A	DUSP10		
		chr1	222696226	G	T	HHIPL2		
		chr1	228346203	G	T	GJC2		
		chr1	236883434	C	A	ACTN2		
		chr2	32515671	G	C	YIPF4		

		chr2	43797627	C	A	THADA		
		chr2	95770343	C	A	MRPS5		
		chr2	112590876	C	A	ANAPC1		
		chr2	128528412	C	A	WDR33		
		chr2	133542955	C	A	NCKAP5		
		chr2	168099932	C	T	XIRP2	rs373331298	T=0.0002/1
		chr2	215279071	G	C	VWC2L		
		chr2	222320370	G	A	EPHA4		
		chr2	239092337	G	A	ILKAP		
		chr3	38991688	G	T	SCN11A		
		chr3	77637932	A	G	ROBO2		
		chr3	137742528	G	T	CLDN18		
		chr3	183958653	C	A	VWA5B2		
		chr3	197639549	C	A	IQCG		
		chr4	8307757	C	T	HTRA3		



		chr4	41633325	G	T	LIMCH1		
		chr4	66286277	G	T	EPHA5		
		chr4	66535309	C	T	EPHA5		
		chr4	70359506	G	A	UGT2B4		
		chr4	119626971	G	A	METTL14		
		chr4	138452888	G	T	PCDH18		
		chr4	185038052	C	A	ENPP6		
		chr4	187534307	G	A	FAT1	rs375308616	A=0.0002/1
		chr5	32074534	C	A	PDZD2		
		chr5	56178098	A	G	MAP3K1	rs373003943	G=0.0002/1
		chr5	77334978	C	G	AP3B1		
		chr5	127641312	G	T	FBN2		
		chr5	134343678	A	G	CATSPER3		
		chr5	140176419	G	A	PCDHA2		
		chr5	140516251	G	T	PCDHB5		

		chr5	140810870	G	A	PCDHGA12		
		chr5	150657166	C	T	SLC36A3	rs375681986	T=0.0004/2
		chr5	161324195	G	T	GABRA1		
		chr6	17292114	C	A	RBM24		
		chr6	69949023	C	T	BAI3	rs145280281	N/A
		chr6	73904628	G	T	KCNQ5		
		chr6	84417562	C	A	SNAP91		
		chr7	45124733	G	T	NACAD		
		chr7	63680103	C	A	ZNF735		
		chr7	123593690	G	T	SPAM1		
		chr7	128767391	C	A	LOC407835		
		chr7	144096568	C	T	NOBOX		
		chr8	24813981	G	A	NEFL		
		chr8	29924353	G	T	TMEM66		
		chr8	41547760	C	A	ANK1		

		chr8	90993041	T	C	NBN		
		chr8	113349034	G	T	CSMD3		
		chr8	116426942	C	A	TRPS1		
		chr8	121587381	G	A	SNTB1	rs149155827	N/A
		chr8	125094648	G	A	FER1L6		
		chr8	133083705	C	A	HHLA1		
		chr8	133637539	C	A	LRRC6		
		chr8	144996997	G	A	PLEC		
		chr9	990271	C	A	DMRT3		
		chr9	27950137	C	A	LINGO2		
		chr9	73240119	G	T	TRPM3		
		chr9	78947517	G	T	PCSK5		
		chr9	79259769	C	T	PRUNE2		
		chr9	86617451	T	A	RMI1		
		chr10	24810766	G	T	KIAA1217		

		chr10	28378668	G	T	MPP7		
		chr10	50534149	C	A	C10orf71		
		chr10	71880334	C	T	AIFM2	rs376397847	N/A
		chr10	120070733	C	A	FAM204A		
		chr10	131506200	C	A	MGMT		
		chr10	135347371	C	A	CYP2E1		
		chr11	4790787	C	A	OR51F1		
		chr11	5290860	C	A	HBE1		
		chr11	6867420	C	A	OR10A5		
		chr11	22363249	C	T	SLC17A6		
		chr11	46671866	A	G	ATG13		
		chr11	58477270	C	A	GLYAT		
		chr11	60470876	C	A	MS4A8		
		chr11	78489665	G	T	TENM4		
		chr11	83170962	C	A	DLG2		

		chr11	92495151	G	T	FAT3		
		chr11	92533749	G	T	FAT3		
		chr11	92881896	G	A	SLC36A4	rs201279167	N/A
		chr11	107663488	C	T	SLC35F2		
		chr11	114569031	C	A	NXPE2		
		chr11	124294299	C	A	OR8B4		
		chr11	130275659	T	A	ADAMTS8		
		chr12	89054	C	T	LOC100288778	rs12405900	N/A
		chr12	9161613	G	T	KLRG1		
		chr12	52910917	C	A	KRT5		
		chr12	57843119	G	T	INHBC		
		chr12	123984021	C	T	RILPL1		
		chr13	46820737	G	T	LRRC63		
		chr13	94482582	G	T	GPC6		
		chr14	21993592	C	A	SALL2		

		chr14	44974159	C	A	FSCB		
		chr14	65008159	G	A	HSPA2		
		chr14	105849702	C	A	PACS2		
		chr15	24921052	G	A	NPAP1		
		chr15	50264869	G	T	ATP8B4		
		chr15	81565491	G	T	IL16		
		chr15	84694186	C	T	ADAMTSL3		
		chr15	88483955	C	T	NTRK3		
		chr16	2053672	G	T	ZNF598		
		chr16	20482430	G	T	ACSM2A		
		chr16	31051060	C	T	STX4		
		chr16	57600543	G	T	GPR114		
		chr16	58768048	C	A	GOT2		
		chr17	3977620	C	T	ZZEF1	rs150892365	N/A
		chr17	72699246	G	A	CD300LF	rs202053089	A=0.0002/1

		chr17	77808594	C	T	CBX4		
		chr18	59757775	C	A	PIGN		
		chr19	10812902	G	T	QTRT1		
		chr19	36166848	G	A	UPK1A		
		chr19	45774753	C	T	MARK4	rs144525861	N/A
		chr19	56424015	C	A	NLRP13		
		chr19	58238871	G	A	ZNF671		
		chr21	39086792	C	T	KCNJ6		
		chr21	46624561	G	A	ADARB1	rs183042891	A=0.0002/1
		chr21	47687001	C	T	MCM3AP		
		chr21	47910597	G	T	DIP2A		
		chr22	20760413	G	A	ZNF74		
		chr22	36556806	C	T	APOL3		
		chrX	26235826	C	A	MAGEB5		
		chrX	29414482	G	T	IL1RAPL1		

		chrX	34148342	G	T	FAM47A		
		chrX	36122697	C	A	CHDC2		
		chrX	56591925	G	T	UBQLN2		
		chrX	85631830	G	T	DACH2		
		chrX	100086512	C	A	CSTF2		
		chrX	114141823	G	T	HTR2C		
		chrX	132833945	C	A	GPC3		
		chr1	11561594	G	T	PTCHD2		
		chr1	11584030	G	T	PTCHD2		
		chr1	33998820	C	A	CSMD2		
		chr1	34209150	G	T	CSMD2		
		chr2	128186330	C	A	PROC		
		chr2	141777585	C	A	LRP1B		
		chr2	179595059	A	G	TTN		
		chr2	198949768	G	T	PLCL1		



		chr2	198949880	G	T	PLCL1		
		chr4	111427874	G	T	ENPEP		
		chr5	41853583	C	A	OXCT1		
		chr6	152563464	G	T	SYNE1		
		chr12	69656302	G	A	CPSF6		
		chr12	25398285	C	T	KRAS	rs121913530	N/A
		chr12	69656304	G	A	CPSF6		
		chr15	42149107	C	A	SPTBN5		
		chr15	42175659	G	T	SPTBN5		
		chr21	47548821	G	T	COL6A2		
		chrX	70514212	G	A	NONO		
37A4	MAP	chr1	169773278	C	A	C1orf112		
		chr4	139163187	C	A	SLC7A11		
		chr5	140183171	G	T	PCDHA3		
		chr7	14517827	G	T	DGKB	rs185430844	T=0.0002/1

		chr7	43477672	G	A	HECW1		
		chr7	64167137	G	T	ZNF107		
		chr7	142168539	G	T	TCRBV5S6A3N2T		
		chr7	148769143	G	A	ZNF786		
		chr8	38090612	G	T	DDHD2		
		chr8	53558303	C	A	RB1CC1		
		chr8	110984838	C	T	KCNV1		
		chr8	121706028	G	A	SNTB1		
		chr8	144999670	T	C	PLEC		
		chr9	13190185	C	A	MPDZ		
		chr9	140379058	C	A	PNPLA7		
		chr9	140379072	C	A	PNPLA7		
		chr10	81706265	C	T	SFTPD		
		chr11	34378535	G	A	ABTB2		
		chr11	55872829	T	G	OR8H2		

		chr12	1137574	C	T	ERC1		
		chr12	5603762	G	A	NTF3		
		chr12	8993983	G	T	A2ML1		
		chr12	48378337	C	A	COL2A1		
		chr12	75678842	G	T	CAPS2		
		chr14	29237587	G	A	FOXG1		
		chr16	84227767	C	T	ADAD2		
		chr16	89970561	C	T	TCF25		
		chr17	21092080	G	T	DHRS7B		
		chr19	7677172	C	T	CAMSAP3		
		chr19	19257394	T	C	MEF2B,MEF2BNB-MEF2B		
		chr19	51201201	C	T	SHANK1		
		chr19	55447773	G	A	NLRP7	rs104895526	A=0.0002/1
		chr19	57703298	T	C	ZNF264		
		chr20	61288384	C	T	SLCO4A1		

		chr22	50689282	G	T	HDAC10		
		chrX	51487034	G	T	GSPT2		
		chrX	129148663	C	T	BCORL1		
		chr2	95770343	C	A	MRPS5		
		chr2	239092337	G	A	ILKAP		
		chr3	137742528	G	T	CLDN18		
		chr4	138452888	G	T	PCDH18		
		chr4	185038052	C	A	ENPP6		
		chr5	140516251	G	T	PCDHB5		
		chr5	161324195	G	T	GABRA1		
		chr8	116426942	C	A	TRPS1		
		chr9	78947517	G	T	PCSK5		
		chr11	4790787	C	A	OR51F1		
		chr11	6867420	C	A	OR10A5		
		chr11	58477270	C	A	GLYAT		

		chr14	105849702	C	A	PACS2		
		chr15	81565491	G	T	IL16		
		chr19	45774753	C	T	MARK4	rs144525861	N/A
		chrX	85631830	G	T	DACH2		
		chrX	100086512	C	A	CSTF2		
		chr12	25398285	C	T	KRAS	rs121913530	N/A
		chr2	128186330	C	A	PROC		
		chr2	141777585	C	A	LRP1B		
		chr2	198949880	G	T	PLCL1		
		chr4	111427874	G	T	ENPEP		
		chr5	41853583	C	A	OXCT1		
		chr12	69656302	G	A	CPSF6		
		chr12	69656304	G	A	CPSF6		
36A1	MAP	chr1	1562724	C	G	MIB2		
		chr7	150069524	C	A	REPIN1		

		chr9	2191336	G	T	SMARCA2		
		chr13	101736104	G	A	NALCN		
		chr14	105609043	C	A	JAG2		
		chr16	1584382	G	T	TMEM204		
		chr16	1961757	C	T	HS3ST6		
		chr21	47831517	C	A	PCNT		
		chrX	48385629	G	A	EBP		
36A3	MAP	chr5	13882892	C	A	DNAH5		
		chr6	152527386	C	T	SYNE1		
		chr6	152647170	C	A	SYNE1		
		chr10	50105587	C	T	WDFY4		
		chr15	31329970	C	A	TRPM1		
		chr1	62676043	C	A	L1TD1		
		chr1	65858434	G	T	DNAJC6		
		chr1	120295996	C	A	HMGCS2		

		chr1	152329718	G	T	FLG2		
		chr1	157804381	C	A	CD5L		
		chr1	159899145	C	A	IGSF9		
		chr1	170961391	G	A	MROH9		
		chr1	186301472	G	T	TPR		
		chr1	245865885	G	A	KIF26B		
		chr1	248028097	C	T	TRIM58		
		chr1	248813362	G	T	OR2T27		
		chr2	18112753	G	T	KCNS3		
		chr2	69049960	G	T	ARHGAP25		
		chr3	14939476	C	A	FGD5		
		chr3	49213157	C	T	KLHDC8B		
		chr3	110852874	G	T	PVRL3		
		chr3	128060730	C	T	EEFSEC		
		chr3	130799287	C	A	NEK11		

		chr3	143567137	C	A	SLC9A9		
		chr3	148596512	G	A	CPA3		
		chr3	186395074	G	T	HRG		
		chr3	189526163	G	A	TP63		
		chr3	191179207	G	T	PYDC2		
		chr3	193166037	C	A	ATP13A4		
		chr4	2833299	C	T	SH3BP2	rs141262371	N/A
		chr4	37448558	G	T	KIAA1239		
		chr4	41983909	C	A	DCAF4L1		
		chr4	87691306	G	T	PTPN13		
		chr4	118005732	C	A	TRAM1L1		
		chr4	126242685	G	T	FAT4		
		chr4	155484230	G	T	FGF		
		chr4	159091794	C	T	FAM198B		
		chr4	187201479	A	G	F11		



		chr5	38451444	C	A	EGFLAM		
		chr5	42719276	T	A	GHR		
		chr5	112676306	C	A	MCC		
		chr5	141334683	G	A	PCDH12		
		chr5	161119169	C	A	GABRA6		
		chr6	27277415	C	T	POM121L2		
		chr6	72892075	G	A	RIMS1		
		chr6	74498197	G	T	CD109		
		chr6	119511017	C	A	MAN1A1		
		chr7	15652128	G	A	MEOX2		
		chr7	42005546	C	T	GLI3		
		chr7	53103836	G	T	POM121L12		
		chr7	81579775	C	A	CACNA2D1		
		chr7	147844679	G	A	CNTNAP2		
		chr8	22476794	C	A	KIAA1967		

		chr8	28217294	C	A	ZNF395		
		chr8	33454832	C	A	DUSP26		
		chr8	68430243	C	A	CPA6		
		chr8	131880191	T	A	ADCY8		
		chr8	135615050	G	T	ZFAT		
		chr9	19450571	C	A	ACER2		
		chr10	16967251	G	T	CUBN		
		chr10	17126446	C	A	CUBN		
		chr10	18840886	G	T	NSUN6		
		chr10	22657511	G	T	SPAG6		
		chr10	50966551	G	A	OGDHL		
		chr10	75391784	G	T	MYOZ1		
		chr10	76790130	T	C	KAT6B		
		chr10	81706268	G	A	SFTPD		
		chr11	3660253	C	G	ART5		

		chr11	4945503	C	A	OR51G1		
		chr11	5624747	C	T	TRIM6,TRIM6-TRIM34		
		chr11	6653348	C	T	DCHS1		
		chr11	6913340	C	T	OR2D2	rs143950338	N/A
		chr11	17491648	C	A	ABCC8		
		chr11	118983200	C	A	C2CD2L		
		chr11	120989326	G	T	TECTA		
		chr12	8212424	G	A	C3AR1		
		chr12	9318699	G	T	PZP		
		chr12	21679409	G	T	C12orf39		
		chr12	22354763	C	A	ST8SIA1		
		chr12	85441159	G	T	LRR1Q1		
		chr13	31495911	C	A	MEDAG		
		chr13	32785165	G	T	FRY		
		chr13	33635001	C	A	KL		

		chr14	51224557	C	A	NIN		
		chr14	64421548	G	T	SYNE2		
		chr14	103928764	G	A	MARK3		
		chr14	106067332	C	A	IGHE		
		chr15	28228583	C	A	OCA2		
		chr15	29561837	C	T	NDNL2		
		chr15	48539175	G	A	SLC12A1		
		chr15	75248668	C	T	RPP25		
		chr15	76225135	G	T	FBXO22		
		chr15	83221355	G	T	CPEB1		
		chr15	100533372	G	A	ADAMTS17		
		chr16	3163480	C	T	ZNF205		
		chr16	30369592	T	C	TBC1D10B		
		chr17	20483213	G	T	CDRT15L2		
		chr17	55752422	G	A	MSI2		

		chr17	66391258	G	T	ARSG		
		chr17	74942512	C	A	MGAT5B		
		chr18	5292066	G	T	ZBTB14		
		chr18	48575111	C	T	SMAD4		
		chr19	5134023	G	A	KDM4B		
		chr19	11577057	G	T	ELAVL3		
		chr19	16275596	C	A	CIB3		
		chr19	33882217	A	G	PEPD		
		chr19	54754703	C	A	LILRB5		
		chr19	56300701	C	A	NLRP11		
		chr19	58371369	C	A	ZNF587		
		chr20	1963721	G	T	PDYN		
		chr20	35526910	G	T	SAMHD1		
		chr21	15596808	C	A	RBM11		
		chrX	48319070	C	T	SLC38A5		

		chrX	69479135	G	T	P2RY4		
		chrX	71360191	C	A	NHSL2		
		chrX	118968986	C	T	UPF3B		
38A2	MAP	chr1	66838270	C	T	PDE4B	rs185910614	T=0.0006/3
		chr1	77334315	C	T	ST6GALNAC5		
		chr1	147380878	T	G	GJA8		
		chr1	151735559	G	C	MRPL9		
		chr1	152325661	G	T	FLG2		
		chr1	156020136	C	A	UBQLN4		
		chr1	158607968	C	A	SPTA1		
		chr1	160325743	C	A	NCSTN		
		chr1	181685240	G	T	CACNA1E		
		chr1	204438315	G	A	PIK3C2B		
		chr1	210856990	G	A	KCNH1		
		chr1	229619862	C	A	NUP133		

		chr1	244868958	C	T	DESI2		
		chr1	248790285	C	A	OR2T11		
		chr2	138169346	G	T	THSD7B		
		chr2	149241525	C	A	MBD5		
		chr2	170428395	C	A	FASTKD1		
		chr2	186697887	G	T	FSIP2		
		chr2	219483473	G	T	PLCD4		
		chr3	38651267	C	T	SCN5A	rs137854608	N/A
		chr3	46492104	G	A	LTF	rs376106456	N/A
		chr3	48600381	C	G	UCN2		
		chr3	52675973	C	A	PBRM1		
		chr3	53126488	C	T	RFT1	rs372822382	N/A
		chr3	77599998	G	T	ROBO2		
		chr3	134329156	G	T	KY		
		chr3	195505275	G	T	MUC4		

		chr4	2341205	C	T	ZFYVE28		
		chr4	30725890	G	T	PCDH7		
		chr4	104510900	G	T	TACR3		
		chr4	122250832	C	A	QRFPR		
		chr5	10426634	G	T	MARCH6		
		chr5	36608618	G	T	SLC1A3		
		chr5	102432341	C	A	GIN1		
		chr5	132232670	G	T	AFF4		
		chr5	141236886	G	T	PCDH1		
		chr6	35923276	C	A	SLC26A8		
		chr6	51695735	C	A	PKHD1		
		chr6	70980057	C	A	COL9A1		
		chr6	133044934	C	T	VNN3		
		chr6	138655324	G	T	KIAA1244		
		chr6	144508591	G	A	STX11		



		chr6	159621607	G	A	FNDC1		
		chr7	77579062	C	T	PHTF2		
		chr7	100460321	C	A	SLC12A9		
		chr7	121681023	G	A	PTPRZ1	rs144255473	A=0.0002/1
		chr7	124386592	C	A	GPR37		
		chr7	124493042	C	A	POT1		
		chr7	152027746	C	T	KMT2C	rs138327796	N/A
		chr8	2824177	G	T	CSMD1		
		chr8	9605606	C	A	TNKS		
		chr8	11281883	C	A	FAM167A		
		chr8	24323273	C	T	ADAM7		
		chr8	67428183	G	T	C8orf46		
		chr8	72964865	C	A	TRPA1		
		chr8	74507481	C	A	STAU2		
		chr8	146029140	C	A	ZNF517		

		chr9	8340438	G	T	PTPRD		
		chr9	21201705	G	T	IFNA7		
		chr9	36390573	G	T	RNF38		
		chr9	71866051	C	A	TJP2		
		chr9	114490035	G	T	C9orf84		
		chr10	6147008	C	T	RBM17		
		chr10	89536097	T	C	ATAD1		
		chr10	121563739	T	C	INPP5F		
		chr10	124376762	G	A	DMBT1	rs148891350	A=0.0054/27
		chr11	4904017	G	T	OR51T1		
		chr11	26587359	G	T	MUC15		
		chr11	36680597	C	A	C11orf74		
		chr11	48328083	C	A	OR4S1		
		chr11	64507673	G	T	RASGRP2		
		chr11	64898180	G	T	SYVN1		

		chr11	65293512	G	A	SCYL1	rs78243061	A=0.0060/30
		chr11	66108250	C	A	BRMS1		
		chr11	75173917	G	T	GDPD5		
		chr11	110450991	C	A	ARHGAP20		
		chr11	123848204	G	T	OR10S1		
		chr11	124180122	C	A	OR8D1		
		chr12	13229018	C	A	KIAA1467		
		chr12	15654838	G	A	PTPRO		
		chr12	22001148	C	A	ABCC9		
		chr12	30869516	G	T	CAPRIN2		
		chr12	41422974	C	T	CNTN1	rs201413314	N/A
		chr12	51126257	C	A	DIP2B		
		chr12	53070954	C	A	KRT1		
		chr12	117907594	G	T	KSR2		
		chr13	38158958	C	T	POSTN		

		chr13	86368266	G	T	SLITRK6		
		chr13	99171538	C	A	STK24		
		chr13	103698508	C	T	SLC10A2		
		chr14	24769994	C	A	NOP9		
		chr14	77751954	C	A	POMT2		
		chr14	81964325	C	A	SEL1L		
		chr14	92055999	C	A	CATSPERB		
		chr15	25616592	C	A	UBE3A		
		chr15	29346877	G	T	APBA2		
		chr15	33928704	C	A	RYR3		
		chr15	43705338	C	A	TP53BP1		
		chr15	74317222	G	T	PML		
		chr16	78198085	G	T	WWOX		
		chr17	74006566	G	T	EVPL		
		chr18	19996926	C	A	CTAGE1		

		chr18	23731836	G	T	PSMA8		
		chr19	518893	G	A	TPGS1		
		chr20	33875438	C	A	FAM83C		
		chr20	44664476	G	A	SLC12A5		
		chr20	60791899	G	T	HRH3		
		chr20	61513176	C	A	DIDO1		
		chr21	19698764	G	T	TMPRSS15		
		chr21	46066539	G	T	KRTAP10-11		
		chr22	19127403	C	T	DGCR14	rs62223875	N/A
		chrX	13785375	G	T	OFD1		
		chrX	15342923	G	T	PIGA		
		chrX	19009101	C	A	GPR64		
		chrX	43590510	C	A	MAOA		
		chrX	83128944	G	T	CYLC1		
		chrX	117679988	C	A	DOCK11		

		chr1	11591019	G	T	PTCHD2		
		chr2	11738913	C	A	GREB1		
		chr2	179416845	C	A	TTN		
		chr2	179436284	C	A	TTN		
		chr4	118975255	G	T	NDST3		
		chr4	119161689	C	A	NDST3		
		chr5	13811890	G	A	DNAH5	rs376707969	N/A
		chr6	112452300	C	A	LAMA4		
		chr6	152748947	C	A	SYNE1		
44A2	MAP	chr1	1149480	G	A	TNFRSF4	rs35304565	A=0.0052/26
		chr1	3740056	C	A	CEP104		
		chr1	55197290	G	T	TTC4		
		chr1	158637690	C	A	SPTA1		
		chr2	10566906	C	T	HPCAL1		
		chr2	23926600	G	A	KLHL29		

		chr2	55615976	C	A	CCDC88A		
		chr2	226516274	G	A	NYAP2	rs200139665	N/A
		chr2	242674838	C	G	D2HGDH		
		chr3	17349601	G	A	TBC1D5		
		chr3	24188283	G	T	THRB		
		chr3	64143001	G	A	PRICKLE2	rs369686744	N/A
		chr3	151161050	G	T	IGSF10		
		chr4	118005846	A	G	TRAM1L1		
		chr4	126412861	G	T	FAT4		
		chr4	156634329	G	T	GUCY1A3		
		chr5	178392459	G	T	ZNF454		
		chr6	5000093	C	A	RPP40		
		chr6	25770694	G	T	SLC17A4		
		chr6	89600306	G	T	RNGTT		
		chr6	138607912	G	T	KIAA1244		

		chr7	43484781	C	A	HECW1		
		chr7	134618822	G	T	CALD1		
		chr8	69143594	C	A	PREX2		
		chr8	95531484	G	T	KIAA1429		
		chr8	121209157	C	A	COL14A1		
		chr8	122626743	G	T	HAS2		
		chr9	107380382	T	C	OR13C9		
		chr10	33471632	C	A	NRP1		
		chr11	5565807	G	T	OR52H1		
		chr11	5905616	C	A	OR52E4		
		chr11	6739471	C	A	GVINP1		
		chr11	72292005	G	C	PDE2A		
		chr11	77553651	G	T	AAMDC		
		chr12	112589836	G	T	TRAFD1		
		chr13	61986726	G	T	PCDH20		



		chr14	56078889	G	T	KTN1		
		chr14	64953866	C	A	ZBTB25		
		chr15	75942620	C	A	SNX33		
		chr16	86565969	C	A	MTHFSD		
		chr17	41958160	C	T	MPP2	rs149942811	N/A
		chr19	53793138	C	A	BIRC8		
		chr22	47103819	C	A	CERK		
		chrX	105137933	C	A	NRK		
		chr17	7720915	G	A	DNAH2	rs377451508	N/A
44A4	MAP	chr1	1431060	T	C	ATAD3B	rs9792997	N/A
		chr15	27772664	C	A	GABRG3		
		chr16	11214615	C	A	CLEC16A		
		chr17	73518276	G	A	TSEN54	rs200434678	N/A
		chr17	79411469	T	C	BAHCC1		
		chrX	114424797	G	T	RBMXL3		

**Appendix 5.** List of common genes between colorectal (Rashid et al. 2015 In press) and duodenal datasets

<b>Gene</b>	<b>Type of mutation</b>
SYCP1	Missense
LOXHD1	Missense
SCUBE1	Missense
GRIA3	Missense
RGS20	Missense
MYO16	Missense
CTNND2	Missense
<b>ATRNL1</b>	<b>Truncating</b>
IGF2R	Missense
CDH2	Missense
ZNF611	Missense
<b>ATP10B</b>	<b>Truncating</b>
PTPRT	Missense
PDZD2	Missense
BAI3	Missense
HHLA1	Missense
DMRT3	Missense
LINGO2	Missense
TCF25	Missense
KRAS	Missense
PLCL1	Missense
JAG2	Missense
ADCY8	Missense
<b>LRRIQ1</b>	<b>Truncating</b>
NHSL2	Missense
ST6GALNAC5	Missense
<b>MUC4</b>	<b>Truncating</b>
TACR3	Missense
FNDC1	Missense
TNKS	Missense
DIP2B	Missense
RYR3	Missense
PML	Missense
TTN	Missense
<b>SYNE1</b>	<b>Truncating</b>
IGSF10	Missense
RNGTT	Missense
<b>HECW1</b>	<b>Truncating</b>
CALD1	Missense
<b>APC</b>	<b>Truncating</b>
KMT2C/MLL3	Missense