

SUPPLEMENTARY INFORMATION

CaGe: A Web-Based Cancer Gene Annotation System for Cancer Genomics

**Young-Kyu Park^{1,2}, Tae-Wook Kang¹, Su-Jin Baek^{1,3}, Kwon-Il Kim², Seon-Young Kim^{1,3},
Doheon Lee^{2*} and Yong Sung Kim^{1,3**}**

¹**Medical Genomics Research Center, KRIBB, Daejeon 305-806, Korea,**

²**Department of Bio and Brain Engineering, KAIST, Daejeon 305-701, Korea,**

³**Department of Functional Genomics, University of Science and Technology, Daejeon 305-806, Korea**

chr15:31723854.CA.uc001zh.1	Q15413	L	I	possibly damaging	RYR3	CGI	astrocytoma;brain tumors;	15451620;9395096;
chr15:79372030.AG.uc010bq.1	B7WVK7	H	R	possibly damaging	IL16	CGI	acute leukemia; aids-associated burkitt&papovs lymphoma;b-cell lymphoma;burkitt&papovs lymphoma;cancer;cancer diseases;crohn&papovs disease;cutaneous t-cell lymphoma;ibd;inflammatory bowel disease;leukemia;lung cancer;malignancy;mf;multiple myeloma;mycosis fungoides;pleomorphic t-cell lymphoma;primary tumor;tumor;tumor;	10662046;10949545;1040184;11154979;11171821;11293814;11709502;11709514;11859968;12191564;12528894;12706406;12769791;14597213;14755377;14760748;15165404;15174966;15802332;2934199;
chr17:1524580.TC.uc002fe.1	Q6P2Q9	N	D	probably damaging	PRPF8	CGI	-	
chr18:27306296.GT.uc002kws.1	P32926	G	V	probably damaging	DSG3	CGI	Human;cancers;carcinoma;carcinomas;cyst;cysts;epidermal inclusion cysts;human squamous cell carcinoma;papillomas;squamous carcinoma;squamous cell carcinomas of the skin;squamous-cell carcinoma;tumor;tumors;tumours;	10427986;12787134;15781625;16120143;2260885;2404575;7533999;8641550;8891017;8982400;9376722;9511724;9705163;9886266;
chr20:40310741.CA.uc010ggj.1	O14522	R	I	possibly damaging	PTPRT	CGI	astrocytoma;cancer;cancers;colorectal cancers;gastric cancers;glial tumors;glioma;human pancreatic adenocarcinoma;lymphoma;	10395944;12501215;14692702;15155950;9524099;
chr21:27132692.CA.uc002ymf.1	Q9UHB8	C	F	probably damaging	ADAMT S1	CGI	breast carcinoma;cancer;colon adenocarcinoma;fibrosarcoma;hct;hepatocellular carcinoma (hcc);hyperplasia;lymph-node metastasis;metastasis;ovarian tumors;pancreatic cancer;prostate cancer;solid tumor;tumor;tumor metastasis;tumour;umr-106 osteosarcoma;	10376599;10811842;11108265;11705860;12716911;15073121;15194513;15539621;15599946;15625312;15967414;15972109;3470543;
chr21:39108096.AG.uc002yqg.1	P15036	T	A	probably damaging	ETS2	CGI	Human/Mouse/Rat/others: acute myelogenous leukemia (aml);acute myeloid leukemia; acute nonlymphoblastic leukemia;adenocarcinoma;adenoma;adenomas;adult t-cell leukemia;advanced carcinoma;antiastrocytoma;atypical adenomatous hyperplasia;blast crisis;breast cancer;breast cancers;breast carcinoma;breast carcinomas;breast tumor;cancer;cancers;carcinogenesis;carcinoma;carcinomas;cervical carcinoma;choriocarcinoma;chronic myeloid leukemia;cmr;colonic adenocarcinoma;colonic adenocarcinomas;colonic neoplasms;esophageal squamous cell carcinoma;esophageal squamous cell carcinoma (escc);esophageal squamous-cell carcinoma;esophageal squamous-cell carcinoma (escc);glioblastoma;hct;head and neck cancer;head and neck tumors;hepatocarcinogenesis;hepatocellular carcinoma (hcc);hepatocellular carcinoma;human breast cancer;human breast carcinoma;human hepatocellular carcinoma;human leukemia;human leukemias;human ovarian cancer;human prostate cancer;human t cell leukemia;human tumor;hyperplastic;hyperplastic polypl;hyperplastic polyps;intrahepatic metastasis;invasive squamous cell carcinoma;large tumors;leukemia;leukemias;leukemogenesis;lung adenoma;lung carcinoma;lymph node metastasis;lymph-node metastasis;malignant transformation;mammary tumors;megakaryoblastic leukemias;metaplasia;metastasis;mouse mammary tumor;mouse mammary tumor;myelomonocytic leukemia;neoplasia;neuroblastoma;non-small cell lung cancer;oncogene;oncogenesis;oncogenes;oncogenes;oncoproteins;oncoproteins;ovarian cancer;ovarian carcinoma;ovarian tumor;pancreatic adenocarcinoma;pancreatic cancer;pancreatic carcinoma;primary hepatocellular carcinoma (phc);prostate cancer;prostate tumor;serous ovarian cancer;small lung carcinoma;squamous cell cancer (scc);squamous cell carcinoma;squamous cell carcinoma of the uterine cervix;squamous-cell carcinoma;tumor;tumorigenesis;tumor;tumour;tumours;	10212281;10485465;10524199;11114728;11334730;11689681;12066221;12095911;12168840;12174931;12438253;12511603;12532432;12554679;12560478;12600747;12628005;12637947;12646185;12659820;12471933;12846561;14500366;14516794;14612405;14647414;14990565;15007164;15027271;15314206;15387369;15637174;815674348;15788656;15806151;16007139;16140924;16240325;16388024;16393289;16533023;16535922;16553541;17063131;17445509;17289954;17412166;17413831;7666753;1888697;1964597;2045100;2149958;2189104;2209540;2216458;2250910;2529204;2536061;2539641;2694094;2882955;3062367;3267212;3276571;3289683;3467145;347202;3941901;7523384;7848100;7937106;8183549;8445738;8527399;8620444;8626480;8649821;8660103;9111309;9122038;9174050;9285565;9303349;9500466;9605774;9639404;9879994;
chrX:115217787.AG.uc010nhq.1	P50052	K	E	probably damaging	AGTR2	CGI	Human/Mouse/Rat: adrenal adenomas;adrenal pheochromocytoma;adrenal tumor;adrenal tumour;basal cell carcinoma (bcc);basal-cell carcinoma (bcc);bce;ecrine poroma;leiomyoma;lobular adenocarcinoma;lung cancer;lung tumors;murine neuroblastoma;pheochromocytoma;pituitary adenomas;rat pituitary tumor;rat pituitary tumors;renal cell carcinoma;renal-cell carcinoma;tumorigenesis;uterine leiomyoma;	11422040;11546977;12174099;16140932;16977796;7716270;8189220;8254815;8389152;8552595;8954043;9105676;9332716;9761377;9863625;

* Genes in **red symbols**: previously reported SCLC genes; genes in **bold symbols**: previously reported lung cancer genes.

Supplementary Table 2. Annotated genes in cancer pathways for the mutations from small cell lung cancer study

Mutation	Gene	Pathway set	Pathway name	Previously reported
chr1:112100232.GT.uc001ebs.1	DDX20	CGI_PATH	METS affect on macrophage differentiation	-
chr1:174926040.CA.uc001gky.1	PAPPA2	CGI_PATH	Genes involved in diabetes pathways	-
chr1:246856769.CA.uc001ier.1	OR2T11	CGI_PATH	Olfactory transduction	-
chr2:136286937.AT.uc002tuu.1	LCT	CGI_PATH	Galactose metabolism	Yes
chr3:131611592.GA.uc010htj.1	COL6A5	CGI_PATH	Genes involved in axon guidance	-
chr4:157951608.AG.uc003iph.1	PDGFC	CGI_PATH	Cytokine-cytokine receptor interaction	Yes
chr6:56674655.TC.uc003pcz.2	DST	CGI_PATH	Genes involved in cell junction organization	Yes
chr6:132901495.GT.uc003qdh.1	TAAR9	CGI_PATH	Neuroactive ligand-receptor interaction	-
chr7:158528524.GT.uc003woh.1	VIPR2	CGI_PATH	Neuroactive ligand-receptor interaction	-
chr9:90846857.GT.uc004aqq.1	SHC3	CGI_PATH	ErbB signaling pathway	Yes
chr10:96437955.AG.uc001kfw.2	CYP2C18	CGI_PATH	Arachidonic acid metabolism	-
chr12:73887452.CA.uc001sxe.1	KCNC2	CGI_PATH	Genes involved in diabetes pathways	Yes
chr13:47935878.GT.uc001vcb.1	RB1	CGI_PATH	Cell cycle	Yes
chr14:64323330.GC.uc001xht.1	SPTB	CGI_PATH	Genes involved in axon guidance	-
chr15:26105373.GC.uc001zbi.1	HERC2	CGI_PATH	Ubiquitin mediated proteolysis	-
chr15:31723854.CA.uc001zhi.1	RYR3	CGI_PATH	Calcium signaling pathway	Yes
chr15:46821163.GT.uc001zwy.1	CEP152	CGI_PATH	Genes involved in cell cycle, mitotic	-
chr15:79372030.AG.uc010blq.1	IL16	CGI_PATH	Cytokine network	Yes
chr17:1524580.TC.uc002fte.1	PRPF8	CGI_PATH	Spliceosome	Yes
chr18:22223866.GT.uc002kvu.2	TAF4B	CGI_PATH	Basal transcription factors	-
chr18:27306296.GT.uc002kws.1	DSG3	CGI_PATH	Genes involved in apoptosis	Yes
chr21:39108096.AG.uc002yxx.1	ETS2	CGI_PATH	Dorso-ventral axis formation	Yes
chrX:115217787.AG.uc010nqh.1	AGTR2	CGI_PATH	Neuroactive ligand-receptor interaction	Yes