

博士論文

**A Comprehensive Genomic Analysis to
Identify Recurrent Structural
Alterations in Esophageal Squamous Cell
Carcinoma**

(食道扁平上皮がんにおける反復構造異常同
定のための包括的ゲノム解析)

ダッタ ムンミ

THE UNIVERSITY OF TOKYO

DOCTORAL THESIS

**A Comprehensive Genomic
Analysis to Identify Recurrent
Structural Alterations in
Esophageal Squamous Cell
Carcinoma**

Author:

Munmee Dutta

Supervisor:

Dr. Kenta Nakai

*A thesis submitted in fulfillment of the requirements for the degree
of Doctor of Philosophy*

in the

Laboratory of Functional Analysis *in silico*

Department of Computational Biology and Medical Sciences

Graduate School of Frontier Sciences

September 2019

Table of Contents

ABSTRACT.....	5
ABBREVIATIONS.....	6
1. Chapter 1: GENERAL INTRODUCTION AND OUTLINE OF THE THESIS.....	7
1.1. Esophageal Cancer.....	8
1.2. Risk factors of Esophageal Squamous Cell Carcinoma.....	9
1.3. Treatment options of ESCC.....	9
1.4. Biomarkers in ESCC.....	10
1.5. Esophageal Squamous Cell carcinoma: its presence in Japan vs China.....	11
1.6. Outline of the thesis.....	11
2. Chapter 2: MATERIALS AND METHODS.....	13
2.1. Clinical Samples.....	14
2.2. Analysis Flowchart.....	14
2.3. Whole Genome Sequencing.....	16
2.4. Somatic mutation calling and mutation signature profiling.....	18
2.5. Structural Variation Calling.....	18
2.6. Copy number alteration calling.....	19
3. Chapter 3: RESULTS.....	20

3.1. Characteristics of ESCC patients and tumors.....	21
3.2. Whole Genome Sequencing of ESCC samples.....	21
3.3. Recurrent coding mutations in ESCC.....	22
3.4. The mutational signatures of ESCC.....	25
3.5. Structural variations in ESCC.....	28
3.6. Somatic copy number alterations in ESCC.....	32
3.7. Assessment of druggable genes in ESCC.....	35
4. Chapter 4: DISCUSSIONS.....	39
5. CONCLUSIONS.....	44
6. REFERENCES.....	45
7. SUPPLEMENTARY FIGURES.....	50
8. SUPPLEMENTARY TABLES.....	57
9. ACKNOWLEDGEMENTS.....	119

ABSTRACT

Esophageal cancer (EC) is the eight most aggressive cancer worldwide. Esophageal squamous cell carcinoma (ESCC) is the predominant type of esophageal cancer in the Asian region, including Japan. On the other hand, the Esophageal Adenocarcinoma (EAC) is prevalent in western countries. The current therapeutic and diagnostic options are still limited, in fact, in some cases tumor recur within short period of post-surgery. This indicates the current knowledge of molecular carcinogenesis and progression of ESCC needs to be improved. A previous study reported mutational landscape of Japanese ESCCs by using exome sequencing. However, somatic structural alterations were yet to be explored. To provide a comprehensive mutational landscape, I performed whole genome sequencing (WGS) analysis of biopsy specimens from 20 ESCC patients in a Japanese population. WGS analysis identified non-silent coding mutations of *TP53*, *ZNF750* and *FAT1* in ESCC. Six mutational signatures were detected in ESCC, one of which showed significant association with smoking status. Recurrent structural variations, many of which were chromosomal deletions, affected genes such as *LRP1B*, *TTC28*, *CSMD1*, *PDE4D* and *WWOX* in 25%–30% of tumors. Somatic copy number amplifications at *11q13.3* (*CCND1*), *3q26.33* (*TP63/SOX2*), and *8p11.23* (*FGFR1*) and deletions at *9p21.3* (*CDKN2A*) were identified. Overall, these multi-dimensional view of genomic alterations improve the understanding of the ESCC development at molecular level and provides future prognosis and therapeutic implications for ESCC in Japan.

ABBREVIATIONS:

EC: Esophageal Cancer

ESCC: Esophageal Squamous Cell Carcinoma

EAC: Esophageal Adenocarcinoma

WGS: Whole Genome Sequencing

WES: Whole Exome Sequencing

SNV: Single Nucleotide Variation

SV: Structural Variation

CNA: Copy Number Alteration

CHAPTER 1

GENERAL INTRODUCTION AND OUTLINE OF THE
THESIS

1. INTRODUCTION

1.1. Esophageal Cancer

Esophageal cancer is one of the most aggressive malignancy globally. It is the eighth most common cancer type and sixth most common cause of cancer-related death worldwide. Esophageal cancer has two major subtypes: esophageal squamous cell carcinoma (ESCC) and esophageal adenocarcinoma (EAC). The incidence of esophageal cancer varies from place to place. The incidence rate of ESCC is high in the Asian regions including Japan, China and India and low in Western countries including North America¹. On the other hand, EAC predominates in the Western countries. These geographical differences highlighted the role of race, living style and genetic factors in the development of ESCC. Despite the advancement of the diagnostic techniques and treatment of ESCC, the survival rate is still poor. After diagnosis, usually 15% - 20% ESCC patients survive for only ~5 years². The development process of ESCC occur through multiple steps. It starts with a normal squamous epithelium and advances to low-grade intraepithelial neoplasia (LGIN), high-grade intraepithelial neoplasia and then finally develops to invasive carcinoma². ESCC develops most commonly in male patients than women and in older people age more than 50 years. ESCC is often detected and diagnosed at an advanced stage due to the lack of early detection. The growing incidence of ESCC cases every year and poor prognosis require this disease to get more focus on the methods for early detection and effective treatment.

1.2. Risk factors of Esophageal Squamous Cell Carcinoma

Tobacco smoking and alcohol drinking are the two major risk factors of ESCC development. Current and ex-smokers both have higher risk of ESCC development than nonsmokers. Total packs of smoking per year and total number of cigarettes per day was correlated with the ESCC incidence³. Tobacco smoke is loaded with carcinogenic tobacco-specific nitrosamine substances which increases risk of ESCC in direct contact of these substances and esophageal mucosa. Acetaldehyde, an organic compound, found in high amount in the alcoholic beverages and frequent consumption of these alcoholic beverages leads to ESCC development². Acetaldehyde interacts with DNA and forms DNA adducts which promote gene mutation. In addition, micronutrient deficiency and genetic variants that harm the activity of alcohol-metabolizing enzymes also promote ESCC⁴.

1.3. Treatment options of ESCC

There are many different treatment options available to treat the patients with ESCC. These approaches include chemotherapy, endoscopic therapy, radiotherapy and surgery. In many countries neoadjuvant chemotherapy is used as standard approach of treatment for locally progressed ESCC. In Japan, ESCC is most conventionally treated by the standard neo-adjuvant chemotherapy followed by surgical resection. Preoperative chemotherapy with cisplatin and fluorouracil is considered as standard treatment option for patients in advanced stage of ESCC^{5,6}. Response rate to this standard therapy is moderate (35–40%)⁶. The varying response among patients might be partly attributed to the genetic heterogeneity of tumors. The endoscopic treatment is used to treat the early-

stage ESCC which has minimal risk of metastasis to the lymph node. The depth of invasion, horizontal spread, and presence or absence of multifocal lesions are examined prior to the endoscopic treatment. Chemoradiotherapy (CRT) has become more effective treatment over radiotherapy alone in patients with locally advanced ESCC.

1.4. Biomarkers in ESCC

Regarding biomarkers in ESCC, the high-throughput sequencing technologies uncovered wide informations of genomic alterations in ESCC. *TP53*, a tumor suppressor, is being considered as the most frequent somatic mutation at rates from 50% - 90% of ESCC patients^{7,8,9}. Most tumor suppressors are commonly inactivated by nonsense or frameshift mutations, however, *TP53* is mostly mutated by missense mutations. Somatic mutations in *TP53* is also occur in ovarian, colorectal, head and neck, larynx, and lung cancers. Apart from *TP53*, other genes which are responsible for regulation of cell cycle and differentiation *CDKN2A*, *RBI*, *NFE2L2*, *NOTCH1* and *NOTCH3* also found to be frequently mutated in ESCC. Mutations in these genes are generally found in 2% to 10% of the ESCC cases^{7,10}. Further, frequent amplification is also common in some other genes such as *CCND1*, *CDK4*, *CDK6* and *MDM2* which lead ESCC development².

1.5. Esophageal Squamous Cell carcinoma: its presence in Japan vs China

Esophageal Squamous Cell Carcinoma is most commonly found in the Asian countries, mostly in China and Japan. The majority of the ESCC cases (~80%) occur only in China. Although ESCC is common in China and Japan, ESCC of both the countries share some common as well as different characteristics. Smoking and alcohol drinking are attributed as concerning risk factors for ESCC of both the countries. In Japan, ESCC is the tenth most common cancer type while it is the fourth most frequent cancer type in China¹¹. ESCC incidence and mortality rates are higher in China than in Japan. Even though the incidence rate is lower, smoking and drinking shows strong association with ESCC in Japan than in China. The male-female ratio of ESCC mortality is 2:1 in China whereas 6:1 in Japan, which clearly demonstrates the prevalence of ESCC in men than women¹².

1.6. Outline of the thesis

Many studies recently characterized somatic mutations in ESCC from China and Japan using whole-exome sequencing (WES). These WES studies reported frequent mutations of *TP53*, *CDKN2A*, *NOTCH1*, *RBI*, *ERBB2* and *NFE2L2* in ESCC^{11,7,13}. While somatic mutations are important, structural variations (SVs) and somatic copy number alterations (CNAs) would also affect the development of ESCC. SVs have the capability to rearrange the large genomic alterations which impact in the treatment and prediction of its consequences in patients. However, systematic characterization of somatic mutations, mutational signatures, SVs and CNAs together have not been investigated in Japanese ESCC at the whole-genome level.

In this study, I attempted to investigate the whole genome sequencing of the 20 pairs of matched tumor and normal ESCC samples in a Japanese population. The samples were comprehensively analyzed to show the somatic mutations in important genes, mutational signatures and their association with clinical features. SVs and CNAs analysis also identified potential target genes and regions in ESCC. The characterization of the mutational landscape in Japanese ESCC will guide our understanding of the disease in a better way and provide potential targets for the precision treatment and therapeutic prevention in future.

CHAPTER 2

2. MATERIALS AND METHODS

2.1 Clinical samples

Esophageal Squamous cell carcinoma tumor and normal blood samples of 20 patients were obtained in Kindai University hospital, Osaka, Japan. All the patients agreed to participate in the study and provided informed consent following ICGC guidelines. The Institutional Review Board at RIKEN and Kindai University Hospital approved the study. Tumor tissues in esophagus were collected by biopsy, and histologically confirmed as ESCC. The patients were treated with neoadjuvant chemotherapy followed by surgical resection after collecting the samples. The clinical and pathological information of the resected specimens was reviewed by the Kindai University Hospital. The clinico-pathological data are demonstrated in the **Table 1** and **Supplementary Table S1**.

2.2. Analysis Flowchart

To establish a mutational landscape in ESCC and identify potential biomarkers from malignancy, I performed the genomic analysis of the ESCC samples. I integrated different computational methods in order to perform this genomic analysis. The main analysis was primarily categorized into four parts, namely somatic mutations calling, mutational signatures profiling, structural variations calling and somatic copy number alterations calling. The **Figure 1** shows the schematic representation of the WGS analysis pipeline performed in this study.

Sex	Male	13
	Female	7
Histology	Squamous cell carcinoma	19
	Basaloid squamous cell carcinoma	1
Tumor location	Cervical esophagus	1
	Upper thoracic esophagus	2
	Middle thoracic esophagus	13
	Lower thoracic esophagus	3
	Abdominal esophagus	1
Tumor stage	II	2
	III	14
	IV	4
Age	≥ 60	18
	≤ 60	2
Smoking status	Smoker	14
	Non-smoker	6
Alcohol drinking status	Drinker	16
	Non-drinker	4
Response to chemotherapy	Responder	10
	Non-responder	10

Table 1: Summary of the clinical information of the ESCC samples used in this study.

2.3. Whole genome sequencing

To identify the mutational events and driver genes that contribute to the development of ESCC in Japanese population, DNA of tumor and matched blood samples were obtained from 20 ESCC patients. The samples were collected by biopsy from patients with ESCC before neo-adjuvant chemotherapy at the Kindai University Hospital. These ESCC samples were provided by Dr. Takushi Yasuda, Faculty of Medicine, Kindai University Hospital. Among the 20 samples, 10 samples responded well to the therapy while rest 10 samples showed poor response. The 20 pairs of tumor and blood samples were performed Whole genome sequencing (WGS). WGS of the ESCC samples was undertaken in the Laboratory for Cancer Genomics, RIKEN Center for Integrative Medical Sciences under supervision of Dr. Hidewaki Nakagawa. The tumor DNA were extracted from the ESCC samples, and normal DNA from the lymphocytes in blood. The libraries were prepared using TruSeq Nano DNA Library Prep Kit (Illumina) following the manufacturer's protocol. Paired-end sequencing of 101- or 126-bp reads was performed using HiSeq2000/2500. Sequence reads were mapped to the human reference genome GRCh37 using BWA. The Polymerase Chain Reaction (PCR) duplicates were removed by Samtools and Picard tool (<http://broadinstitute.github.io/picard/>). After removal of the PCR duplicates, the average genome coverage for the tumor samples was 43.4× and 34.3× for the blood samples.

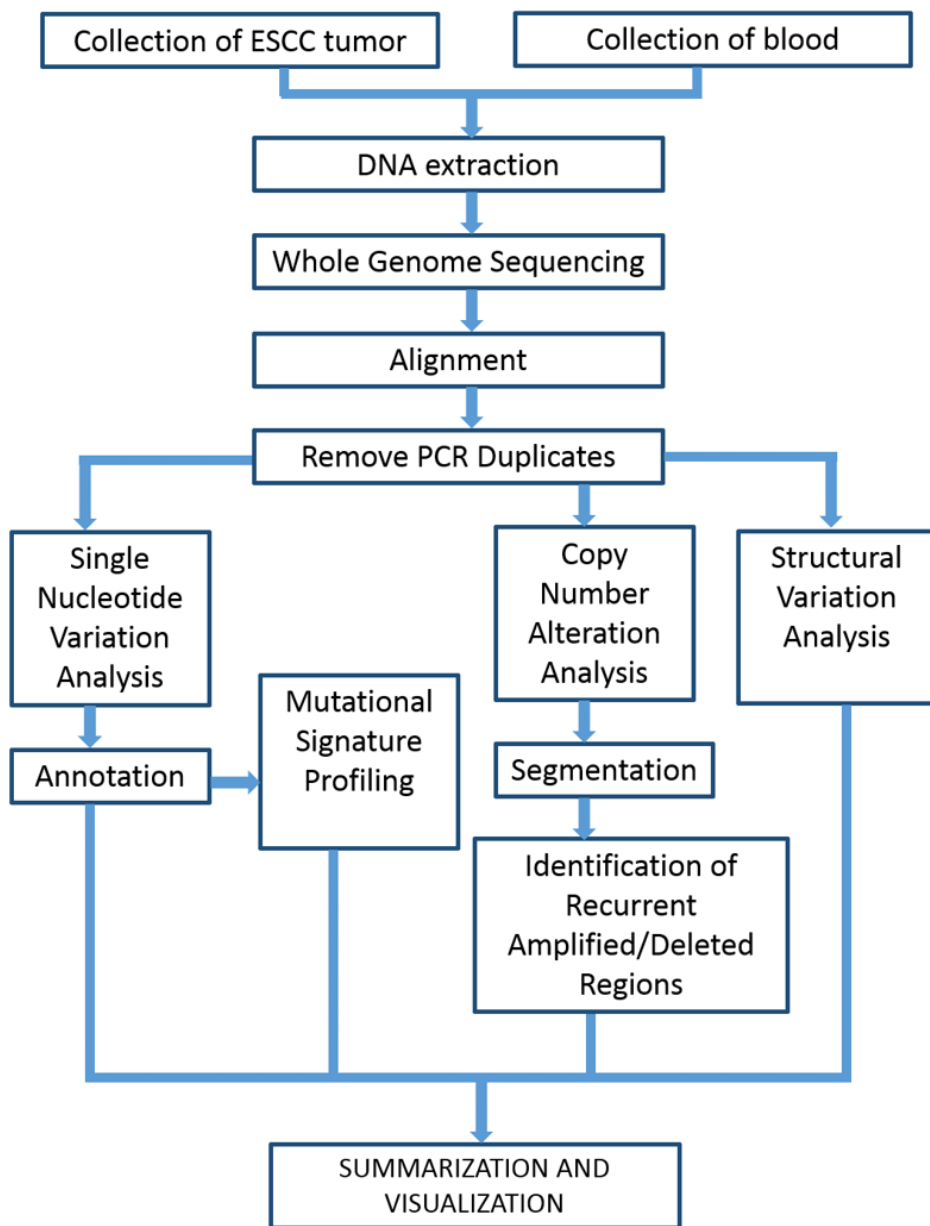


Figure 1: Workflow of whole genome sequencing analysis.

2.4. Somatic mutation calling and mutation signature profiling

Somatic single nucleotide variations (SNVs) and short insertions/deletions (INDELs) were called as previously described¹⁴. I used Annovar to perform the functional annotation of the detected SNVs and INDELs in this study¹⁵. Further, I used the R package MAFtools for the summarization and visualization of the annotated variants¹⁶. Here, I analyzed mutational signatures as well and for that purpose I used the SignatureAnalyzer (<https://software.broadinstitute.org/cancer/cga/msp>) tool from Broad Institutes for the detection of mutational signatures in 20 ESCC. I calculated the cosine similarity scores to compare the identified mutational signatures in ESCC with the mutational signatures available in the Catalogue of Somatic Mutations in Cancer (COSMIC) database (version 2)¹⁷.

2.5. Structural Variation Calling

I called the somatic Structural Variations (SVs) by two software: RIKEN-in-house pipeline¹⁴ and Genomon2 structural variation (SV) detection tool (<https://github.com/Genomon-Project/GenomonSV>) and finally merged both the calls by Perl script. In the Genomon2 SV detection, the SVs were called using minimum junction number 2, maximum control variant read pair 10 and minimum overhang size 50. The SVs were then filtered using parameters minimum allele frequency 0.07, maximum control variant read pair 1, control depth threshold 10 and minimum overhang size 100. The inversion size threshold set to 1000 and the simple repeats were removed. Here, SVs were categorized into four classes based on the mapping information for a read pair. The

four classes are intrachromosomal deletion, inversion and tandem duplication, and interchromosomal translocation, respectively.

2.6. Copy number alteration calling

I used VarScan2 software to call the somatic copy number alterations (CNAs)¹⁸. For normalization of CNAs data ratio was calculated by analyzing read depth of the matched tumor and normal samples. SAMtools flagstats function was used to obtain the read depth of all the samples. The thresholds used to call the CNAs using CopyNumber function were p-value 0.001, minimum segment size 100 and maximum segment size 1000. The output of the above step was filtered using the copyCaller function. The raw CNAs were segmented by the circular binary segmentation method implemented in the R package DNACopy. The GISTIC2.0 algorithm was used to identify the significant recurrent copy number amplified and deleted regions¹⁹.

CHAPTER 3

3. RESULTS

3.1 Characteristics of ESCC patient and tumor

The patient and tumor characteristics of the 20 Japanese ESCC patients being sequenced and analyzed here are shown in Table S1. The average age of the 20 patients was 66.4 years (minimum 51 and maximum 81). This data shows that ESCC is usually common in people aged above 50 years. Among the 20 ESCC samples 13 were male and 7 were female. 16 of the 20 patients had alcohol drinking history and 14 of the 20 patients had smoking history. Interestingly, four female patients were observed to have no smoking and alcohol drinking history. Despite smoking and drinking are major risk factors of ESCC, this observation suggests there might be some other factors responsible for tumor development in these samples. Consistent with previous esophageal cancer studies, the location of the 15 ESCC tumors was either middle or upper esophagus and remaining 5 were located in cervical, lower and abdominal esophagus. Most of the ESCC cases investigated here were at the tumor stage III (14 samples), 2 samples were stage II tumor and 4 were stage IV tumors.

3.2 Whole Genome Sequencing of ESCC samples

The WGS data were analyzed by integrating different computational methods. In this study, single nucleotide variations (SNVs), small insertions and deletions (INDELs), mutational signatures, structural variations (SVs), and copy number alterations (CNAs) were investigated. In all, WGS analysis identified 104,534 somatic SNVs, 10,523 somatic INDELs, and 2,641 somatic SVs in the 20 ESCC tumors (Supplementary Table S2). Also,

10 significant copy number altered regions were detected in ESCC by the WGS analysis. In addition, the mutational signature profiling was able to identify six mutational signatures in ESCC.

3.3 Recurrent coding mutations in ESCC

I investigated the somatic SNVs, short INDELS in the protein-coding regions and their splice sites. I found a total of 623 nonsynonymous mutations in ESCC genome. Among them, 507 were missense mutations (81.38%), 37 were nonsense mutations (5.94%), 27 were frame-shift deletions (4.33%), 26 were splice-site mutations (4.17%), 22 were frame-shift insertions (3.53%) and 4 were in-frame insertions (0.64%).

The WGS analysis identified recurrently mutated genes, including previously known esophageal cancer associated oncogenes and tumor-suppressor genes (*TP53* and *ZNF750*) (**Figure 2, Supplementary Figure S1**). *TP53* mutations were most frequent and found in 55% of the samples. Other genes that recurrently mutated in ESCC include *AHNAK2* (20%), *MUC16* (10%), *F5* (15%), *MTR* (15%), *DST* (10%), *FAT1* (10%), *AHNAK* (10%) and *USH2A* (10%). *AHNAK2* is a large protein located at 14q32 region. The biological function of *AHNAK2* is not yet certain, however, recent studies established *AHNAK2* as a potential biomarker in clear cell renal cell carcinoma and pancreatic ductal adenocarcinoma^{20,21}. *MUC16*, which encodes CA125 antigen, is well-known for its association with tumor growth and development and has been used as a biomarker in ovarian cancer^{22,23}. Moreover, we detected new candidate genes in ESCC such as

CACNA1B (10%), *CC2D2A* (10%), *DNAH14* (10%), *GRIN3A* (10%), *IGFNI* (10%) and *MATN1* (10%).

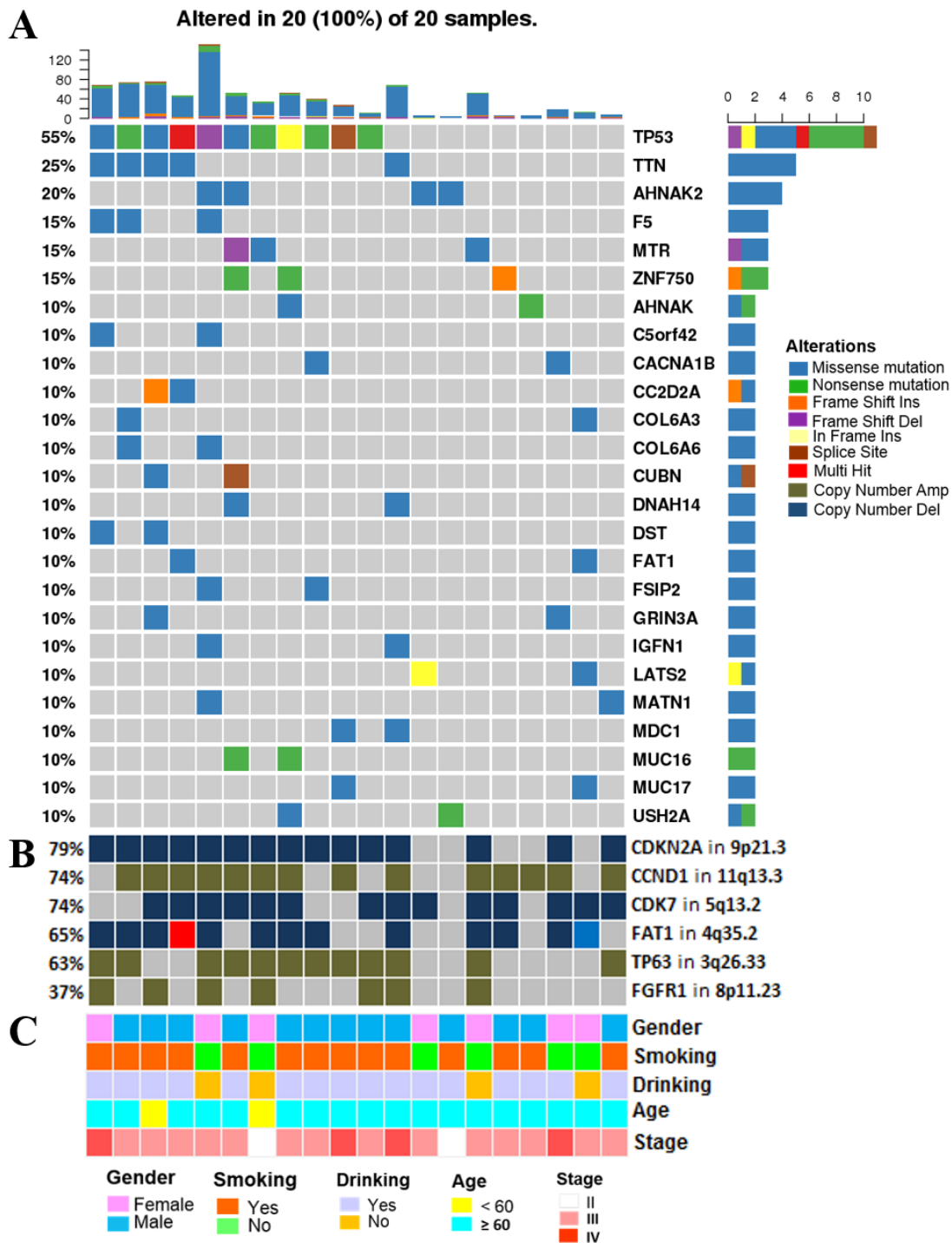


Figure 2: The landscape of somatic alterations in ESCCs from 20 Japanese patients. (A) Genes recurrently altered by SNVs/INDELs. The figures shows the genes mutated in 2 or more samples. Mutation types are labelled on the right legend. (B) Recurrent copy number alterations. The legend on the left side shows frequency. (C) Clinical features of the ESCC patients.

3.4 The mutational signatures of ESCC

In order to understand mutational mechanisms of ESCC in Japan, I analyzed the mutational signatures of the tumors of the 20 ESCC patients. A Bayesian variant of the non-negative matrix-factorization method was applied to trinucleotide substitution patterns and was able to extract six mutational signatures (**Figure 3A**). Finally, I compared the mutational signatures in ESCC with the signatures of the COSMICs database¹⁷ (**Supplementary Figure S2 and Supplementary Table S3**).

The identified Signature W1 was highly similar to the COSMIC signature 18 (cosine similarity 0.933), but the biological aetiology of this signature is not known. Signature W2 was characterized by C>A and C>T mutations and found in almost 85% of the ESCC patients. Signature W2 was similar to the COSMIC signature 1 (cosine similarity 0.850), which is an age-dependent signature. Signature W4 mainly represented by T>C mutation, was similar to COSMIC signature 5 and 16 (cosine similarity 0.868 and 0.9, respectively). A WGS study showed association of COSMIC signature 16 with alcohol drinking and smoking status in ESCC patients of Chinese origin⁴. Smoking tobacco increases the chances of cancer development. Tobacco smoke is composed of many carcinogens which are capable enough to disrupt the DNA. Tobacco smoking has been linked to many type of cancers such as lung cancer, liver cancer, esophageal cancer and gastric cancer²⁴. COSMIC Signature 5, which is also characterized by C>T and T>C mutations, was reported in smoking associated lung cancer. Signature W5 displayed high similarity with COSMIC signature 2 and 13 (cosine similarity 0.811 and 0.835, respectively), which was characterized by C>T and C>G mutations. COSMIC signatures 2 and 13 were assigned to the hyperactivity of the APOBEC family enzyme, cytidine deaminases¹⁷. There was a

sample in the dataset of this study, OK101 which was basaloid squamous cell carcinoma of esophagus, a rare type of malignancy. This sample was a hypermutator in our cohort (**Figure 3B**). Somatic SNVs of this sample were dominated by the Signature W5. Signature W6 was characterized by CpTpT-to-CpGpT mutations and highly similar to COSMIC signature 17 (cosine similarity 0.945). COSMIC signature 17 is often found in esophagus and stomach cancer, but its aetiology is unknown. Signature W3 which was defined by C>A, C>T and T>C mutations appeared to have low similarity with any of the COSMIC signatures (all cosine similarity <0.7).

Since, previous studies did not find signatures associated with smoking alone in ESCC despite smoking being a major risk factor of this cancer^{11,9}. I examined the association of the mutation signatures with clinical features in ESCC. I found signature W4 was significantly elevated in the smoking patients compared to non-smoking patients ($P = 0.01474$, t -test) (**Figure 3C**). Enrichment of signature W4 in smokers confirms the carcinogenic role of tobacco smoking in ESCC. Signature W4 shared similarity with COSMIC signature 5 and 16. Smoking associated mutational signatures were found higher in the squamous cell carcinomas of lung and head & neck²⁵. However, there was no difference in total mutation burden between the smoker and non-smoker group ($P = 0.7$, t -test) unlike liver cancer. In liver cancer patients, similar signature showed higher mutation rate in smoker group than the nonsmokers²⁴. The other signatures showed no association with smoking, gender, response to chemotherapy and alcohol drinking status ($P > 0.05$, **Supplementary Figure S3A, S3B, and S3C**).

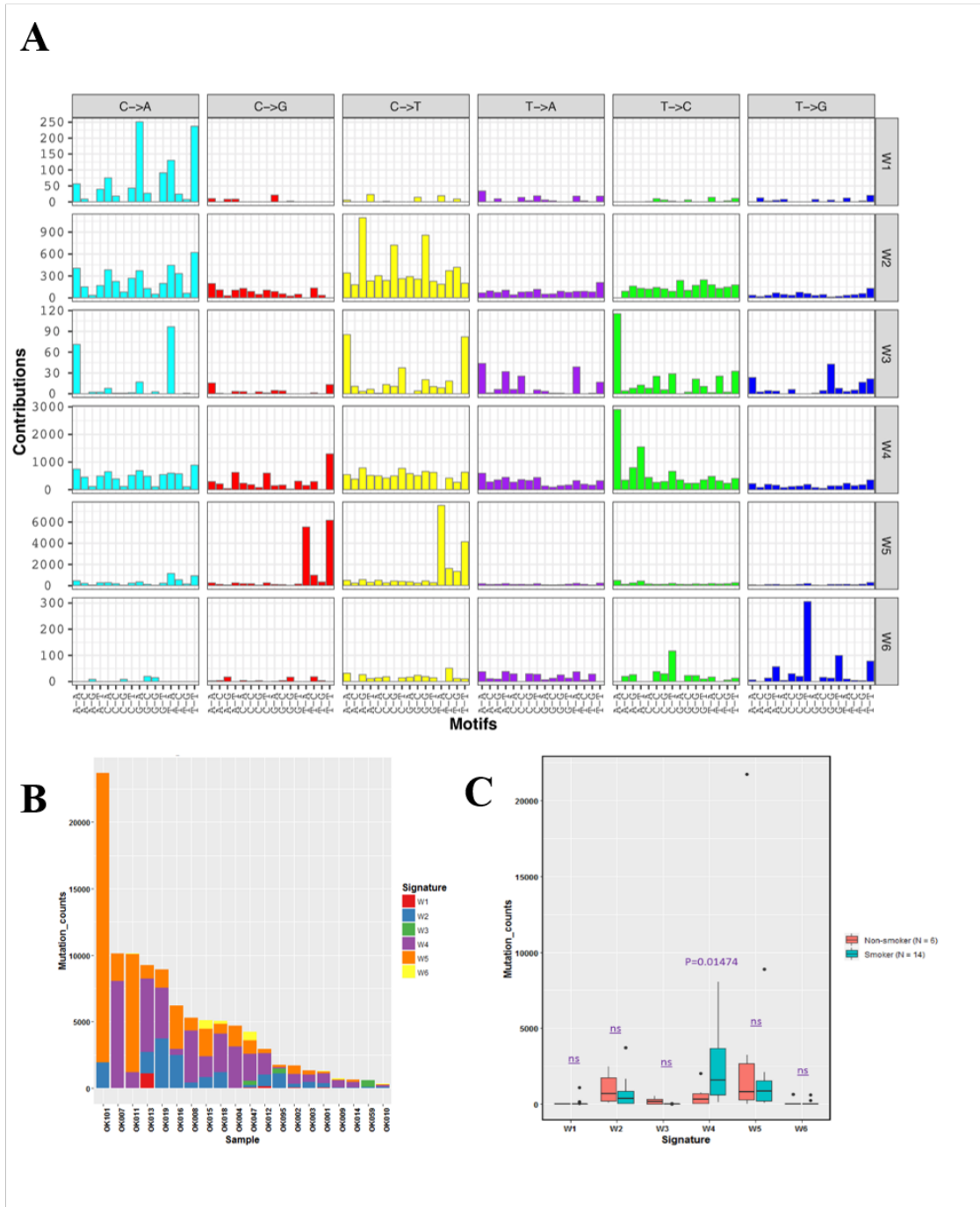


Figure 3: Mutational signatures of whole genome of 20 ESCC samples. (A) Patterns of substitutions for each signatures W1–W6 in ESCC. (B) Mutation burden and contribution of six mutational signatures across the ESCC genomes. (C) Boxplot showing the association of mutational signatures and smoking habit of patients with ESCC. P-value was calculated using Wilcoxon rank sum test. ns: $P > 0.05$.

3.5. Structural variations in ESCC

WGS analysis detected a total of 2,641 SVs in the 20 ESCC samples with an average of 132 SVs per tumor (**Figure 4, Supplementary Figure S4**). Consistency with ESCC from China, the deletions were found to be the most abundant (41.27%) type of SVs in the Japanese ESCC (**Figure 5A**)¹³. Among the identified SVs, I found 1,090 (41.27%) deletions followed by 793 (30.03%) inversions, 391 (14.80%) translocations and 367 (13.90%) tandem duplications, respectively. The number of SVs varied among the samples, ranging from 0 to 515 (**Supplementary Table S2**). In particular, OK007 and OK008 had a high number of SVs, which affected most of their chromosomes. Frequent SVs in these samples may indicate the presence of chromothripsis, a phenomenon where a single or multiple chromosomes rearranged from ten to hundreds times on a chromosomal arm.

This analysis also detected many genes, which are associated with different cancer types, affected by SVs in ESCC (**Fig 5B and Supplementary Table S4**). Consistently with a report on Chinese ESCC⁴, *LRP1B* (30%) and *TTC28* (30%) were the most commonly affected genes in Japanese ESCC. The tumor suppressor gene *LRP1B* was mostly affected by deletions, whereas *TTC28* was by interchromosomal translocations. Recurrent SVs in *CSMD1*, *WWOX*, *SDK1*, *ERC1*, *PDE4D* and *SHANK2* were also identified in five tumor samples. The CUB and Sushi multiple domains 1 (*CSMD1*) is a tumor suppressor gene reported to be associated with poor prognosis in many cancer types including breast cancer, gastric cancer, head and neck squamous cell carcinoma (HNSCC), and hepatocellular carcinoma^{26,27,28}. Deletion of *WWOX*, a tumor suppressor gene, is frequent in esophageal adenocarcinoma (32%) and stomach adenocarcinoma (30.2%)

and also observed in other human cancer types such as colon adenocarcinoma, bladder urothelial carcinoma and lung adenocarcinoma²⁹. *SDK1* is a cell adhesion molecule that plays an active role in cancer development. Somatic mutations in this gene was reported in adrenocortical carcinoma³⁰. Moreover, an epigenomic study identified *SDK1* as an epigenomic driver in hepatocellular carcinoma³¹. Structural rearrangements of *ERC1* was previously reported in Chinese ESCC⁴. *ERC1* was also found as a prognostic biomarker in HNSCC³². Previously, a genome wide association study in Chinese Han population identified that SNP rs10052657 in *PDE4D* on *5q11* was associated with ESCC risk³³. Homozygous deletion of *PDE4D* was also identified in breast, lung and gastric cancers which established it as a tumor-promoting gene³⁴.

The comparison of the genes affected by SVs was also examined based on the clinical features of the ESCC samples (**Supplementary Table S5**). It was noticed that *WWOX*, *CSMD1*, *SDK1*, *LRP1B*, *ERC1*, *PDE4D* and *SHANK2* rearrangements were mostly common in male patients with smoking and alcohol drinking history. On the other hand, *TTIC28* rearrangements was common in patients irrespective of gender, smoking and drinking status.

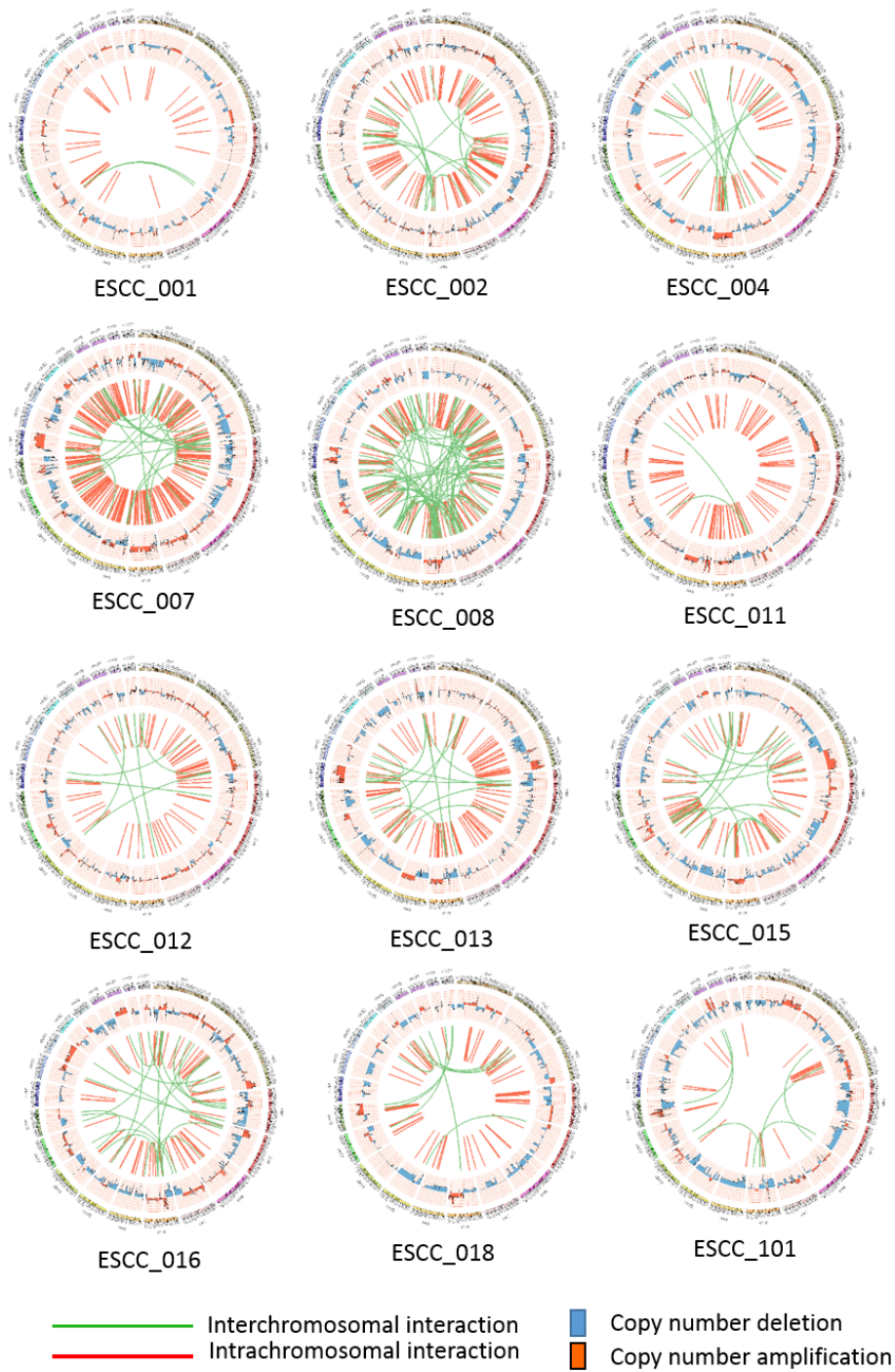


Figure 4: Somatic structural variations in ESCC. Circos plots of SVs and somatic CNAs in 20 ESCC genome. The inner ring represents the SVs: red for intrachromosomal interactions, and green for interchromosomal interactions. The second ring next to SVs displays the CNAs: red for amplifications and blue for deletions. The outer ring shows the chromosome ideogram.

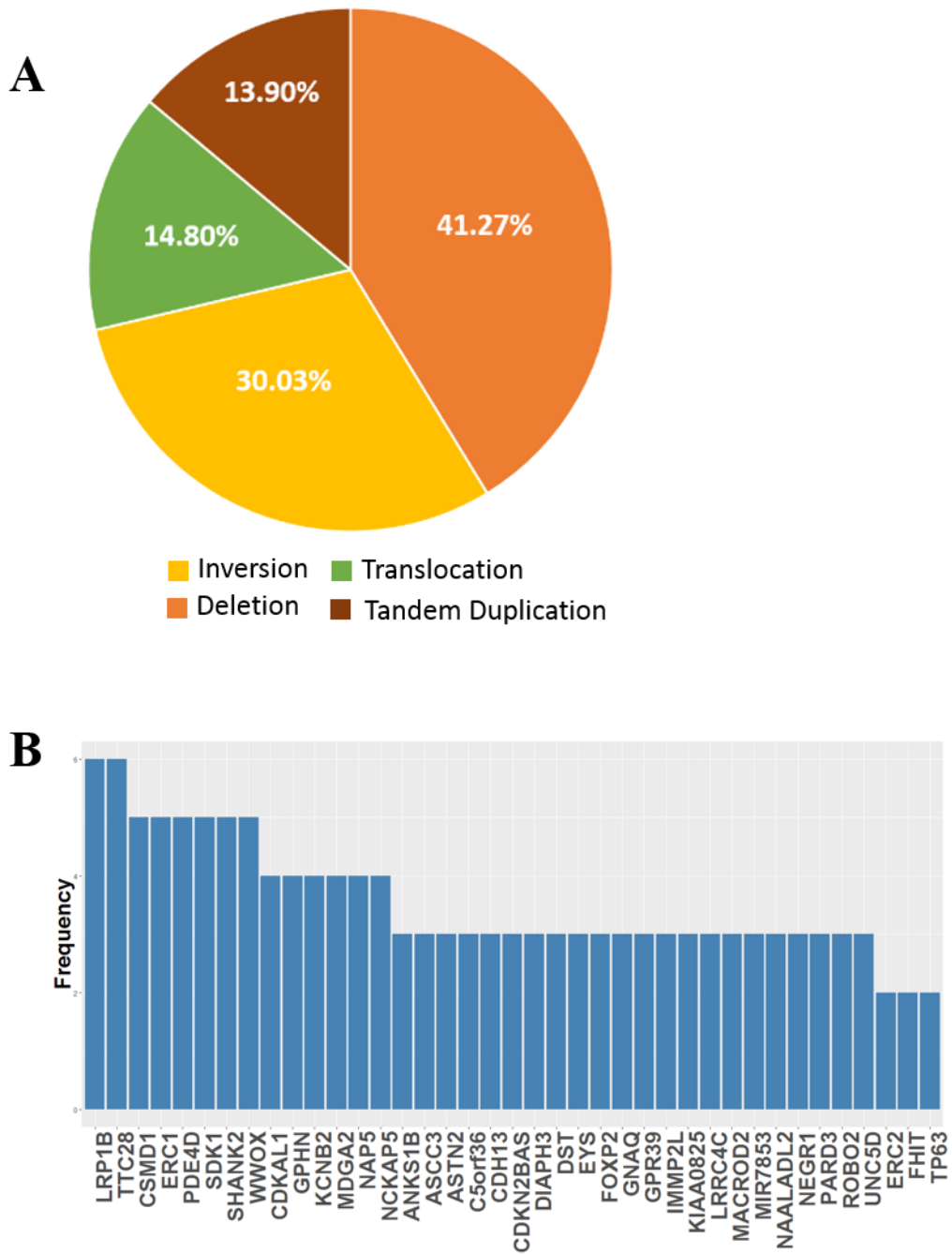


Figure 5: Somatic structural variations in ESCC. **(A)** Different categories of SVs and their frequencies in the 20 ESCCs. **(B)** Genes recurrently affected by SVs.

3.6 Somatic copy number alterations in ESCC

The somatic CNAs were called from the whole genome of the 20 pairs of matched tumor and normal samples to investigate CNAs in ESCC. I used GISTIC2.0 in order to identify the significant recurrently amplified and deleted regions³⁵. A total of 10 CNAs were identified including four frequent amplified regions (*3q26.33*, *8p11.23*, *11q13.3* and *14q21.1*) and six deleted regions (*1q21.1*, *4q35.2*, *5q13.2*, *9p21.3*, *10p12.33* and *21p11.2*) (**Figure 6A and B, Supplementary Figure S5 and Supplementary Tables S6 and S7**).

The copy number amplification of *3q26.33* was found in 63% of the samples which included important cancer driver genes *PIK3CA*, *SOX2*, *FGF12* and *TP63* (**Supplementary Figure S6B**). Alterations of *PIK3CA* which leads to dysfunction of cell cycle control, was also commonly observed in colorectal cancer, HNSCC, gastric cancer and breast cancer^{36,37,38,39}. This oncogene showed strong association with drug sensitivity in many different cancer types including ESCC^{39,40}. Furthermore, amplification of *TP63* was also commonly found in squamous cell carcinomas of other organs such as lung, and neck and head which showed over-expression in these tumors^{41,42}. *TP63* is a transcription factor and plays important role in tumorigenesis, apoptosis and embryogenesis^{42,43}. Notably, *TP63* was also found to be affected by SVs in 15% of the ESCC samples in this study.

It was observed that *11q13.3* region was most frequently amplified (74%) in the ESCC dataset, consistently with the observation in Chinese ESCC⁴⁴ (**Supplementary**

Figure S6A). This amplified region contained many important genes such as *CCND1*, *FGF3*, *FGF4* and *FGF19* which established this region as a prominent target in ESCC. Amplification of *8p11.23* (37%) harbored *FGFR1*, which plays an active role in cell growth and differentiation. A previous study reported amplification of *FGFR1* as a negative prognostic factor in lung squamous cell carcinoma⁴⁵. Amplification of *FGFR1* gene was also found in oral squamous cell carcinoma, esophageal squamous cell carcinoma, breast cancer and pancreatic cancer⁴⁶. Earlier studies reported *FGFR1* as a potential drug target in many human cancers^{47,46,8}.

Copy number deletion of *9p21.3* was found in 79% of the samples and was the most common deletion in the ESCC (**Supplementary Figure S5**). This region contains *CDKN2A*, an essential regulator of cell cycle (**Figure 6C**). Many previous studies reported recurrent mutations and loss in *CDKN2A* in many cancer types such as pancreatic cancer and oral squamous cell carcinoma^{48,49}. *10p12.33* was deleted in 79% of the samples and harbored gene *MRC1*, a M2 macrophage antigen known to be associated with tumor development, invasion, metastasis and angiogenesis^{50,51}. Deletion of *4q35.2* was found in 63% of the samples. This region includes the tumor suppressor *FAT1*, which was recurrently deleted in colorectal cancers, glioblastoma and HNSCC⁵². Notably, recurrent SNVs/INDELs in *FAT1* was also observed in this study as well. Overall, this study detected many copy number altered peaks and important ESCC-associated driver genes such as *FGFR1*, *PIK3CA*, *CCND1*, *CDKN2A* and *MRC1*, which have the potential to be used as therapeutic targets in future^{39,8,49,50,53}.

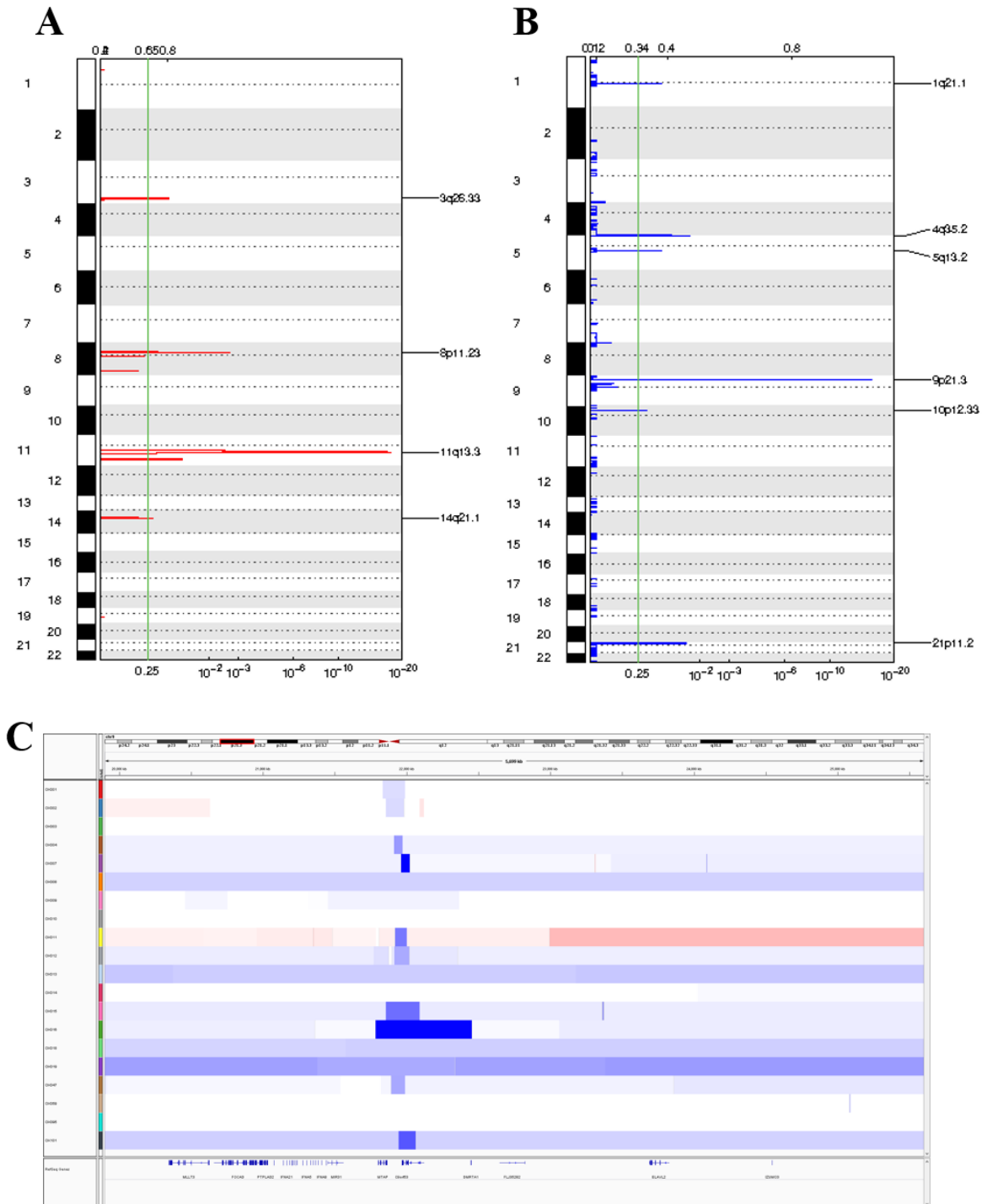


Figure 6: Somatic copy number alterations in ESCC. **(A)** Regions of significant recurrent amplifications and, **(B)** deletions identified by GISTIC2.0 plotted for each chromosome. **(C)** Common deletion at 9p21.3 in all ESCC samples visualized by IGV.

3.7 Assessment of druggable genes in ESCC

In order to investigate the druggability of the genes identified by the CNA analysis, I analyzed the genes with the drug-gene interaction database^{54,55}. I found that 67 genes out of the 442 genes have at least one drug target that interact with it (**Supplementary Table S8**). *HTR1A*, *PIK3CA*, *FGFR1*, *ADRB3*, *HPIK3R1*, *MTNR1A*, *CDKN2A*, *CCND1*, *CDK7*, and *ANO1* were the top druggable genes that showed large interactions with drugs (**Table 2**). Notably, amplification of *CCND1* (74%), *PIK3CA* (63%), *FGFR1* (37%) and deletion of *CDKN2A* (79%) and *CDK7* (74%) genes were observed in a considerable amount of samples in our analysis. In all, CNA analysis was able to identify potentially druggable genes including *CCND1*, *FGFR1*, *PIK3CA* and *CDKN2A* which might be used for the treatment of ESCC in future.

The genes, identified by SV analysis in this study, were also examined for their the druggable property. I found 149 out of the 958 genes have at least one interaction with drug (**Supplementary Table S9**). *LRP1B*, *PDE4D*, *WWOX*, *GPHN*, *KCNB2*, *FHIT*, *CDKN2A*, *TP53* and *BRCA2* were the important druggable genes determined with large number of gene-drug interactions. SVs were found frequently in these genes such as *LRP1B* (30%), *PDE4D* (25%), *WWOX* (25%), *GPHN* (20%) and *KCNB2* (20%) in the ESCC genomes. On the other hand, I investigated the druggable property of the genes detected by the SNV analysis as well. I identified 212 genes out of the 1,111 genes that showed at least one interaction with drug (**Supplementary Table S10**). This analysis identified *PIK3CA*, *TP53*, *BRAF*, *NOTCH1*, *FGFR2*, *F11*, *MTOR*, *LRP2*, and *RBI* as the

most prominent druggable genes with large number of drug-interactions (**Supplementary Table S11**) .

I posteriorly combined the analysis of druggable genes identified by all the mutational events SNVs, SVs and CNAs in ESCC. I found some genes such as *TP53*, *NOTCH1*, *RBI*, *JAK2*, *ACAN* and *SCN9A* which were commonly altered by both SNVs and SVs in ESCC have at least one interaction with drugs (**Figure 7**). Moreover, genes, for example, *PIK3CA*, *F11*, *EPHB3* and *TLR3* had interaction with at least one drug were commonly altered by SNVs and CNAs. I also detected some druggable genes such as *CDKN2A*, *ANO1* and *NDUFB5* were altered by both SVs and CNAs. However, no druggable gene was identified which was altered commonly by all the three mutation patterns in this analysis.

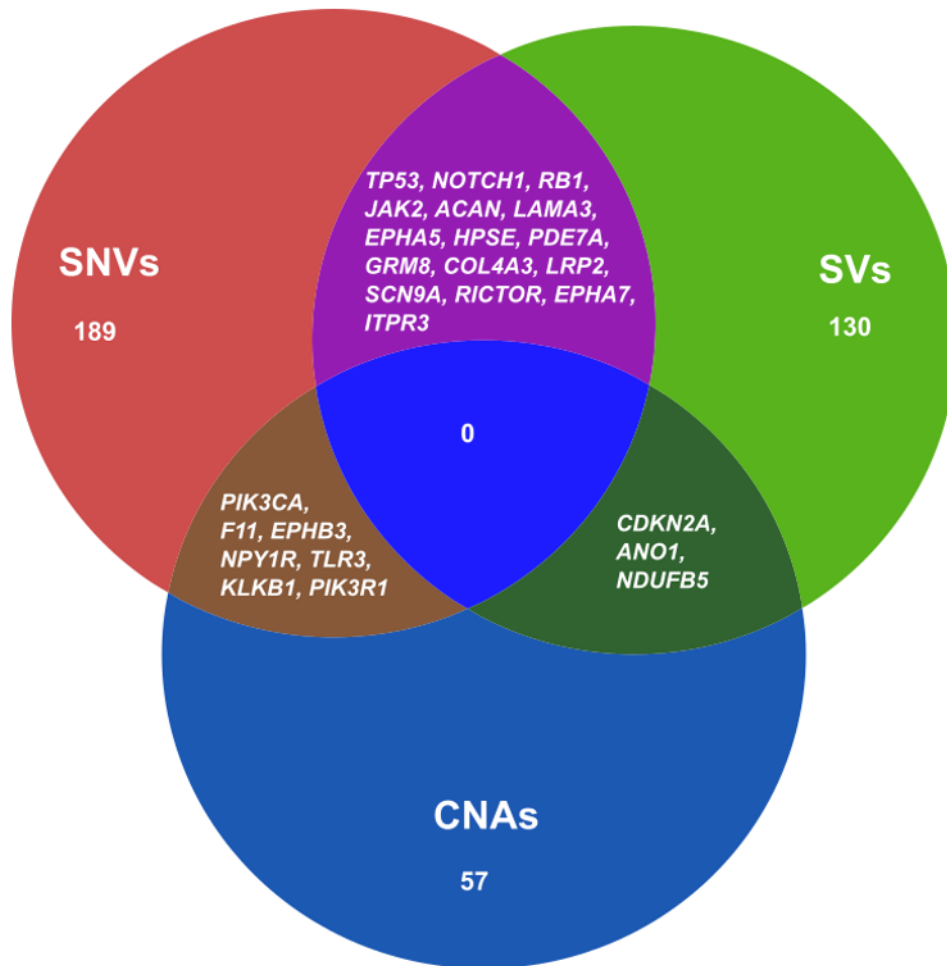


Figure 7: Venn diagram: showing the druggable genes altered by different mutation events in ESCC. The figure shows the druggable genes identified by SNV, SV and CNA analysis in ESCC.

Genes	No. of interaction
HTR1A	152
PIK3CA	149
FGFR1	59
ADRB3	47
HPIK3R1	35
MTNR1A	24
CDKN2A	20
CCND1	16
SSTR1	16
CDK7	14
ANO1	12
GLRA3	12
SST	10
HEXB	10

Table 2: Summary of the druggable genes identified by CNA analysis. This list shows the genes with ≥ 10 interactions with drug.

CHAPTER 4

4. DISCUSSIONS

In this study, I performed a comprehensive whole genome sequencing analysis in order to explore the mutational landscape in ESCC in a Japanese population. Previously, several studies reported mutations in ESCC mostly using whole exome data, which is limited to coding mutations. In this study, I provided a complete analysis of mutational signatures, SNVs, SVs and CNAs in the whole-genome level in ESCC. Consistent with the previous studies, this study also confirmed the frequent mutation of *TP53*, *ZNF750* and *FAT1* in ESCC patients^{4,11,13}. In addition, previously unreported recurrent mutations in protein coding genes such as *CACNA1B*, *DNAH14*, *GRIN3A*, *IGFN1* and *MATN1* were also observed in ESCC. These genes were attributed in different cancers such as breast, prostate, lung, endometrial and renal cell carcinoma by different groups. High mutation rate of *DNAH14* was previously reported in breast cancer⁵⁶. *CACNA1B*, the N-type calcium channel family, was found to be overexpressed in breast and prostate cancer⁵⁷.

By analyzing mutational signatures, distinct signature profiles in ESCC and their correlation with environmental risk factors and clinical features were shown in this study. Importantly, among the identified six mutational signatures, I showed significant association of one signature W4 with smoking status of ESCC patients. Smoking associated signature was more commonly occurred in male patients (65%) with smoking history than female, and 62% of those patients were non-responder to chemotherapy. In contrast, the female patients (30%) who showed this signature were mostly non-smoker (86%). The female and nonsmoker patients who showed signature W4, 84% of them

responded well to the chemotherapy. Correlation of signature W4 with smoker patients suggests the crucial role of tobacco smoking in the tumorigenesis of ESCC.

Recently, a WGS analysis of UK patients suggested C>A/T as a distinct mutational pattern with evidence of ageing in EAC⁵⁸. We confirmed that C>T and T>C substitutions were also dominant type mutations with age and smoking imprint in ESCC as well. Further, it was previously described that these mutation patterns characterize the smoking and alcohol drinking signatures by Alexandrov et al.²⁴. On the other hand, mutational signatures identified here showed high similarity not only with COSMIC signatures associated with alcohol drinking and smoking but also with age and APOBEC signature activity related signatures. APOBEC family enzymes alter cytidine to uracil through the process of deamination within DNA which leads to mutation clusters in different cancers⁵⁹. Previous studies reported the association of *PIK3CA* mutations with APOBEC signature in Chinese and Japanese ESCC^{4,11,9}. In this study, we found that APOBEC signature is positively associated ($P = 0.00003969$, Wilcoxon rank sum test) with amplification of *PIK3CA*. APOBEC signature was observed in all the ESCC tumor samples (100%) which suggests APOBEC mediated genomic damages play a major role in ESCC development. We confirmed it by identifying enrichment of APOBEC-mediated signatures as a distinct mutational pattern in ESCC.

In the present study, I analyzed SVs using WGS of 20 ESCCs which was the first-time report in Japanese population. A recent analysis of WGS of 94 ESCCs from China showed *LRP1B* and *TTC28* as the most commonly affected genes by SVs⁴. I confirmed this finding in Japanese ESCCs as well. *LRP1B* was mostly affected by deletions and *TTC28* by interchromosomal translocation in all the cases. Besides, SVs were found in

other prominent genes such as *WWOX*, *CSMD1*, *ERC1*, *PDE4D*, *SHANK2*, *TP63* and *SDK1*. More importantly, SV affected genes *WWOX*, *CSMD1*, *LRP1B* and *PDE4D* were observed in patients who were male, smoker and alcohol drinker. This study found two patterns of structural rearrangements across all the 20 ESCC genome. In the first pattern samples were found with fewer rearrangements and in the other, samples were found with multiple complex rearrangements. The samples with second pattern might have chromothripsis-like event. Chromothripsis, a phenomenon when multiple rearrangements affect a single or multiple chromosomes in a single event^{60,61}. It is believed that chromothripsis plays important role in the development of cancer. Typically chromothripsis lead structural rearrangements have been found in small number of samples in most cancers except bone, medulloblastoma, melanoma and colorectal cancer⁶¹. In recent years, chromothripsis has emerged as a significant biomarker in different cancers. Chromothripsis may promote cancer development either by increasing copy numbers of oncogenes or by deleting important tumor suppressors. Thus, identification of chromothripsis occurrence in tumors using strict criteria is crucial for cancer genomics. More studies are required with a comparatively larger sample size in future.

By analyzing CNAs, I identified ten significantly amplified and deleted regions in ESCC genomes. These regions harbored many genes that may be used as therapeutic targets. Amplification of *11q13.3* region, which contains *CCND1*, *CTTN*, *SHANK2* and three *FGF*-family genes, was frequently altered in patients that responded to chemotherapy. However, significant association of this region with response to

chemotherapy was not found ($p>0.05$). *CCND1*, a key regulator of the G1 phase of cell cycle, is an important target of chemotherapy response in HNSCC⁶². It has been associated with poor prognosis in many solid cancers including HNSCC⁶². Deletion of *CDKN2A* gene is more frequent in Japanese than Chinese ESCC. I confirmed deletion of *CDKN2A* in *9p21.3* and *MRC1* in *10p12.33* regions as the most common deletion (79%) in our dataset. A previous study on Chinese population also reported deletion of *CDKN2A*, but only 30% of the Chinese samples showed deletion of this gene. The gene-drug interaction analysis was able to detect druggable genes, for example, *FGFR1*, *PIK3CA*, *CCND1*, *CDKN2A*, *CDK7* and *ANO1* that have the potential to interact with at least one drug. Moreover, I identified several druggable genes which were altered by more than one mutational event. Genes such as *TP53*, *NOTCH1*, *RBI*, *JAK2*, and *PDE7A* were commonly altered by SVs and SNVs and *PIK3CA*, *F11*, *EPHB3*, *NPY1R* and *TLR3* were altered by both SNVs and CNAs. Another potential druggable genes *CDKN2A*, a tumor suppressor, *ANO1* and *NDUFB5* were affected by SVs and CNAs in ESCC.

There were some limitations in this study. The main bottle-neck of this study was the sample size. I had only 20 pairs of matched normal and tumor samples, which was not enough to find significantly mutated recurrent genes with high level of frequencies. Secondly, although the patient's chemotherapy response information was available, the small number of sample size did not allow me to associate the identified genomic alterations with chemotherapy response at a significant level. It would be important to associate the genomic alterations with chemotherapy response to select the correct patients for effective neoadjuvant chemotherapy in future.

5. CONCLUSIONS:

The findings in this study confirmed poor lifestyle which includes tobacco smoking and alcohol drinking are the major risk factors of ESCC in Japan. Recently several studies reported mutations in ESCC, however, most of the studies were from Chinese population except one in Japanese ESCC which was whole-exome sequencing study. By analyzing WGS samples, this study provided a comprehensive mutational landscape of ESCC in Japanese population. Several important findings have been accomplished in this study. Six mutational signatures were detected in ESCC which shared similarity with age, alcohol drinking and APOBEC activity related signatures. One of the signatures showed significant association with smoking status of patients. The structural variations that was analyzed for the first time in Japanese ESCC uncovered a number of well-known cancer associated genes such as *LRP1B*, *TTC28*, *SHANK2*, *WWOX* and *TP63*. Finally, confirmed the druggable capability of many genes such as *PIK3CA*, *FGFR1*, *CDKN2A* and *CDK7* which were identified by copy number alteration analysis in ESCC. These genes have the potential to be used in the ESCC treatment in future.

In summary, through this analysis I was able to identify the frequent genomic mutations, mutational signatures and significant association with environmental risk factors, druggable CNAs and genes, and structural rearrangements in ESCC. This comprehensive analysis provided insights into the ESCC development at molecular level and identified targets for the diagnosis and treatment of ESCC in future.

6. REFERENCES

1. Huang F-L, Yu S-J. Esophageal cancer: Risk factors, genetic association, and treatment. *Asian J Surg*. 2018;41(3):210-215. doi:10.1016/j.asjsur.2016.10.005
2. Ohashi S, Miyamoto S, Kikuchi O, Goto T, Amanuma Y, Muto M. REVIEWS IN BASIC AND CLINICAL GASTROENTEROLOGY AND HEPATOLOGY. *Gastroenterology*. 2015;149(7):1700-1715. doi:10.1053/j.gastro.2015.08.054
3. Ishiguro S, Sasazuki S, Inoue M, Kurahashi N, Iwasaki M, Tsugane S. Effect of alcohol consumption, cigarette smoking and flushing response on esophageal cancer risk: a population-based cohort study (JPHC study). *Cancer Lett*. 2009;275(2):240-246. doi:10.1016/j.canlet.2008.10.020
4. Chang J, Tan W, Ling Z, et al. Genomic analysis of oesophageal squamous-cell carcinoma identifies alcohol drinking-related mutation signature and genomic alterations. *Nat Commun*. 2017;8:15290. doi:10.1038/ncomms15290
5. Baba Y, Watanabe M, Yoshida N, Baba H. Neoadjuvant treatment for esophageal squamous cell carcinoma. *World J Gastrointest Oncol*. 2014;6(5):121-128. doi:10.4251/wjgo.v6.i5.121
6. Yoshida K, Suetsugu T, Imai T, Matsuhashi N, Yamaguchi K. Recent advancements in esophageal cancer treatment in Japan. 2018;(April):253-265. doi:10.1002/ags3.12174
7. Song Y, Li L, Ou Y, et al. Identification of genomic alterations in oesophageal squamous cell cancer. *Nature*. 2014;509(7498):91-95. doi:10.1038/nature13176
8. Lin D, Hao J, Nagata Y, et al. Genomic and molecular characterization of esophageal squamous cell carcinoma. *Nat Publ Gr*. 2014;46(5):467-473. doi:10.1038/ng.2935
9. Zhang L, Zhou Y, Cheng C, et al. Genomic Analyses Reveal Mutational Signatures and Frequently Altered Genes in Esophageal Squamous Cell Carcinoma. *Am J Hum Genet*. 2015;96(4):597-611. doi:10.1016/j.ajhg.2015.02.017
10. Gao Y-B, Chen Z-L, Li J-G, et al. Genetic landscape of esophageal squamous cell carcinoma. *Nat Genet*. 2014;46(10):1097-1102. doi:10.1038/ng.3076
11. Sawada G, Niida A, Uchi R, et al. Genomic Landscape of Esophageal Squamous Cell Carcinoma in a Japanese Population. *Gastroenterology*. 2016;150(5):1171-1182. doi:10.1053/j.gastro.2016.01.035
12. Epidemiology of Esophageal Cancer in Japan and China. *J Epidemiol*. 2013;23(4):233-242. doi:10.2188/jea.JE20120162
13. Qin H-D, Liao X-Y, Chen Y-B, et al. Genomic Characterization of Esophageal Squamous Cell Carcinoma Reveals Critical Genes Underlying Tumorigenesis and Poor Prognosis. *Am J Hum Genet*. 2016;98(4):709-727.

doi:10.1016/j.ajhg.2016.02.021

14. Fujimoto A, Furuta M, Totoki Y, et al. Whole-genome mutational landscape and characterization of noncoding and structural mutations in liver cancer. *Nat Genet.* 2016;48(5):500-509. doi:10.1038/ng.3547
15. Wang K, Li M, Hakonarson H. ANNOVAR: functional annotation of genetic variants from high-throughput sequencing data. *Nucleic Acids Res.* 2010;38(16):e164. doi:10.1093/nar/gkq603
16. Mayakonda A, Koeffler HP. Maftools : Efficient analysis , visualization and summarization of MAF files from large-scale cohort based cancer studies . 2016.
17. Alexandrov LB, Nik-Zainal S, Wedge DC, et al. Signatures of mutational processes in human cancer. *Nature.* 2013;500(7463):415-421. doi:10.1038/nature12477
18. Koboldt DC, Zhang Q, Larson DE, et al. VarScan 2 : Somatic mutation and copy number alteration discovery in cancer by exome sequencing. 2012:568-576. doi:10.1101/gr.129684.111.568
19. Mermel CH, Schumacher SE, Hill B, Meyerson ML, Beroukhi R, Getz G. GISTIC2.0 facilitates sensitive and confident localization of the targets of focal somatic copy-number alteration in human cancers. *Genome Biol.* 2011;12(4):R41. doi:10.1186/gb-2011-12-4-r41
20. Wang M, Li X, Zhang J, et al. AHNAK2 is a Novel Prognostic Marker and Oncogenic Protein for Clear Cell Renal Cell Carcinoma. *Theranostics.* 2017;7(5):1100-1113. doi:10.7150/thno.18198
21. Lu D, Wang J, Shi X, Yue B, Hao J. AHNAK2 is a potential prognostic biomarker in patients with PDAC. *Oncotarget.* 2017;8(19):31775-31784. doi:10.18632/oncotarget.15990
22. Gorlov IP, Gorlova OY, Amos CI. Untouchable genes in the human genome: Identifying ideal targets for cancer treatment. *Cancer Genet.* 2019;231-232:67-79. doi:10.1016/j.cancergen.2019.01.005
23. Felder M, Kapur A, Gonzalez-Bosquet J, et al. MUC16 (CA125): tumor biomarker to cancer therapy, a work in progress. *Mol Cancer.* 2014;13:129. doi:10.1186/1476-4598-13-129
24. Alexandrov LB, Ju YS, Haase K, et al. Mutational signatures associated with tobacco smoking in human cancer. *Science.* 2016;354(6312):618-622. doi:10.1126/science.aag0299
25. Wang J, Linxweiler M, Yang W, Chan TA, Morris LGT. Immunomodulatory and immunotherapeutic implications of tobacco smoking in squamous cell carcinomas and normal airway epithelium. *Oncotarget.* 2019;10(39):3835-3839. doi:10.18632/oncotarget.26982
26. Deng N, Goh LK, Wang H, et al. A comprehensive survey of genomic alterations in gastric cancer reveals systematic patterns of molecular exclusivity and co-

- occurrence among distinct therapeutic targets. 2012. doi:10.1136/gutjnl-2011-301839
27. Zhang X, Kang C, Li N, et al. Identification of special key genes for alcohol-related hepatocellular carcinoma through bioinformatic analysis. *PeerJ*. 2019;7:e6375. doi:10.7717/peerj.6375
 28. Jung AR, Eun Y-G, Lee YC, Noh JK, Kwon KH. Clinical Significance of CUB and Sushi Multiple Domains 1 Inactivation in Head and Neck Squamous Cell Carcinoma. *Int J Mol Sci*. 2018;19(12). doi:10.3390/ijms19123996
 29. Hussain T, Liu B, Shrock MS, Williams T, Aldaz CM. WWOX, the FRA16D gene: A target of and a contributor to genomic instability. *Genes Chromosomes Cancer*. 2019;58(5):324-338. doi:10.1002/gcc.22693
 30. Juhlin CC, Goh G, Healy JM, et al. Whole-exome sequencing characterizes the landscape of somatic mutations and copy number alterations in adrenocortical carcinoma. *J Clin Endocrinol Metab*. 2015;100(3):E493-502. doi:10.1210/jc.2014-3282
 31. Gentilini D, Scala S, Gaudenzi G, et al. Epigenome-wide association study in hepatocellular carcinoma: Identification of stochastic epigenetic mutations through an innovative statistical approach. *Oncotarget*. 2017;8(26):41890-41902. doi:10.18632/oncotarget.17462
 32. Szczepanski MJ, DeLeo AB, Luczak M, et al. PRAME expression in head and neck cancer correlates with markers of poor prognosis and might help in selecting candidates for retinoid chemoprevention in pre-malignant lesions. *Oral Oncol*. 2013;49(2):144-151. doi:10.1016/j.oraloncology.2012.08.005
 33. Wu C, Hu Z, He Z, et al. Genome-wide association study identifies three new susceptibility loci for esophageal squamous-cell carcinoma in Chinese populations. *Nat Genet*. 2011;43(7):679-684. doi:10.1038/ng.849
 34. Lin D-C, Xu L, Ding L-W, et al. Genomic and functional characterizations of phosphodiesterase subtype 4D in human cancers. *Proc Natl Acad Sci U S A*. 2013;110(15):6109-6114. doi:10.1073/pnas.1218206110
 35. Mermel CH, Schumacher SE, Hill B, Meyerson ML, Beroukhi R. GISTIC2 . 0 facilitates sensitive and confident localization of the targets of focal somatic copy-number alteration in human cancers. 2011:1-14.
 36. Mei ZB, Duan CY, Li CB, Cui L, Ogino S. Prognostic role of tumor PIK3CA mutation in colorectal cancer: a systematic review and meta-analysis. *Ann Oncol Off J Eur Soc Med Oncol*. 2016;27(10):1836-1848. doi:10.1093/annonc/mdw264
 37. De Mello RA, Castelo-Branco L, Castelo-Branco P, et al. What Will We Expect From Novel Therapies to Esophageal and Gastric Malignancies? *Am Soc Clin Oncol Educ book Am Soc Clin Oncol Annu Meet*. 2018;38:249-261. doi:10.1200/EDBK_198805
 38. Azizi Tabesh G, Izadi P, Fereidooni F, Emami Razavi AN, Tavakkoly Bazzaz J.

- The High Frequency of PIK3CA Mutations in Iranian Breast Cancer Patients. *Cancer Invest.* 2017;35(1):36-42. doi:10.1080/07357907.2016.1247455
39. Du P, Huang P, Huang X, et al. Comprehensive genomic analysis of Oesophageal Squamous Cell Carcinoma reveals clinical relevance. *Sci Rep.* 2017;7(1):15324. doi:10.1038/s41598-017-14909-5
 40. Yokota T, Serizawa M, Hosokawa A, et al. PIK3CA mutation is a favorable prognostic factor in esophageal cancer: molecular profile by next-generation sequencing using surgically resected formalin-fixed, paraffin-embedded tissue. *BMC Cancer.* 2018;18(1):826. doi:10.1186/s12885-018-4733-7
 41. Comprehensive genomic characterization of head and neck squamous cell carcinomas. *Nature.* 2015;517(7536):576-582. doi:10.1038/nature14129
 42. Ohnami S, Ohshima K, Nagashima T, et al. Comprehensive characterization of genes associated with the TP53 signal transduction pathway in various tumors. *Mol Cell Biochem.* 2017;431(1-2):75-85. doi:10.1007/s11010-017-2977-1
 43. Candi E, Agostini M, Melino G, Bernassola F. How the TP53 family proteins TP63 and TP73 contribute to tumorigenesis: regulators and effectors. *Hum Mutat.* 2014;35(6):702-714. doi:10.1002/humu.22523
 44. Ying J, Shan L, Li J, et al. Genome-wide screening for genetic alterations in esophageal cancer by aCGH identifies 11q13 amplification oncogenes associated with nodal metastasis. *PLoS One.* 2012;7(6):e39797. doi:10.1371/journal.pone.0039797
 45. Kim HR, Kim DJ, Kang DR, et al. Fibroblast growth factor receptor 1 gene amplification is associated with poor survival and cigarette smoking dosage in patients with resected squamous cell lung cancer. *J Clin Oncol.* 2013;31(6):731-737. doi:10.1200/JCO.2012.43.8622
 46. Chang J, Liu X, Wang S, et al. Prognostic value of FGFR gene amplification in patients with different types of cancer: a systematic review and meta-analysis. *PLoS One.* 2014;9(8):e105524. doi:10.1371/journal.pone.0105524
 47. von Loga K, Kohlhaussen J, Burkhardt L, et al. FGFR1 Amplification Is Often Homogeneous and Strongly Linked to the Squamous Cell Carcinoma Subtype in Esophageal Carcinoma. *PLoS One.* 2015;10(11):e0141867. doi:10.1371/journal.pone.0141867
 48. Zhen DB, Rabe KG, Gallinger S, et al. BRCA1, BRCA2, PALB2, and CDKN2A mutations in familial pancreatic cancer: a PACGENE study. *Genet Med.* 2015;17(7):569-577. doi:10.1038/gim.2014.153
 49. Padhi SS, Roy S, Kar M, et al. Role of CDKN2A/p16 expression in the prognostication of oral squamous cell carcinoma. *Oral Oncol.* 2017;73:27-35. doi:10.1016/j.oraloncology.2017.07.030
 50. Weber M, Iliopoulos C, Moebius P, et al. Prognostic significance of macrophage polarization in early stage oral squamous cell carcinomas. *Oral Oncol.*

- 2016;52:75-84. doi:10.1016/j.oraloncology.2015.11.001
51. Fang J, Li X, Ma D, et al. Prognostic significance of tumor infiltrating immune cells in oral squamous cell carcinoma. *BMC Cancer*. 2017;17(1):375. doi:10.1186/s12885-017-3317-2
 52. Morris LGT, Kaufman AM, Gong Y, et al. Recurrent somatic mutation of FAT1 in multiple human cancers leads to aberrant Wnt activation. *Nat Genet*. 2013;45(3):253-261. doi:10.1038/ng.2538
 53. Weber M, Buttner-Herold M, Hyckel P, et al. Small oral squamous cell carcinomas with nodal lymphogenic metastasis show increased infiltration of M2 polarized macrophages--an immunohistochemical analysis. *J Craniomaxillofac Surg*. 2014;42(7):1087-1094. doi:10.1016/j.jcms.2014.01.035
 54. Griffith M, Griffith OL, Coffman AC, et al. DGIdb: mining the druggable genome. *Nat Methods*. 2013;10(12):1209-1210. doi:10.1038/nmeth.2689
 55. Cotto KC, Wagner AH, Feng Y-Y, et al. DGIdb 3.0: a redesign and expansion of the drug-gene interaction database. *Nucleic Acids Res*. 2018;46(D1):D1068-D1073. doi:10.1093/nar/gkx1143
 56. Rajendran BK, Deng C-X. Characterization of potential driver mutations involved in human breast cancer by computational approaches. *Oncotarget*. 2017;8(30):50252-50272. doi:10.18632/oncotarget.17225
 57. Wang C-Y, Lai M-D, Phan NN, Sun Z, Lin Y-C. Meta-Analysis of Public Microarray Datasets Reveals Voltage-Gated Calcium Gene Signatures in Clinical Cancer Patients. *PLoS One*. 2015;10(7):e0125766. doi:10.1371/journal.pone.0125766
 58. Secrier M, Li X, de Silva N, et al. Mutational signatures in esophageal adenocarcinoma define etiologically distinct subgroups with therapeutic relevance. *Nat Genet*. 2016;48(10):1131-1141. doi:10.1038/ng.3659
 59. Harris RS, Petersen-Mahrt SK, Neuberger MS. RNA editing enzyme APOBEC1 and some of its homologs can act as DNA mutators. *Mol Cell*. 2002;10(5):1247-1253. doi:10.1016/s1097-2765(02)00742-6
 60. Rode A, Maass KK, Willmund KV, Lichter P, Ernst A. Chromothripsis in cancer cells: An update. *Int J cancer*. 2016;138(10):2322-2333. doi:10.1002/ijc.29888
 61. Korbel JO, Campbell PJ. Criteria for inference of chromothripsis in cancer genomes. *Cell*. 2013;152(6):1226-1236. doi:10.1016/j.cell.2013.02.023
 62. Feng Z, Guo W, Zhang C, et al. CCND1 as a Predictive Biomarker of Neoadjuvant Chemotherapy in Patients with Locally Advanced Head and Neck Squamous Cell Carcinoma. 2011;6(10). doi:10.1371/journal.pone.0026399

7. SUPPLEMENTARY FIGURES

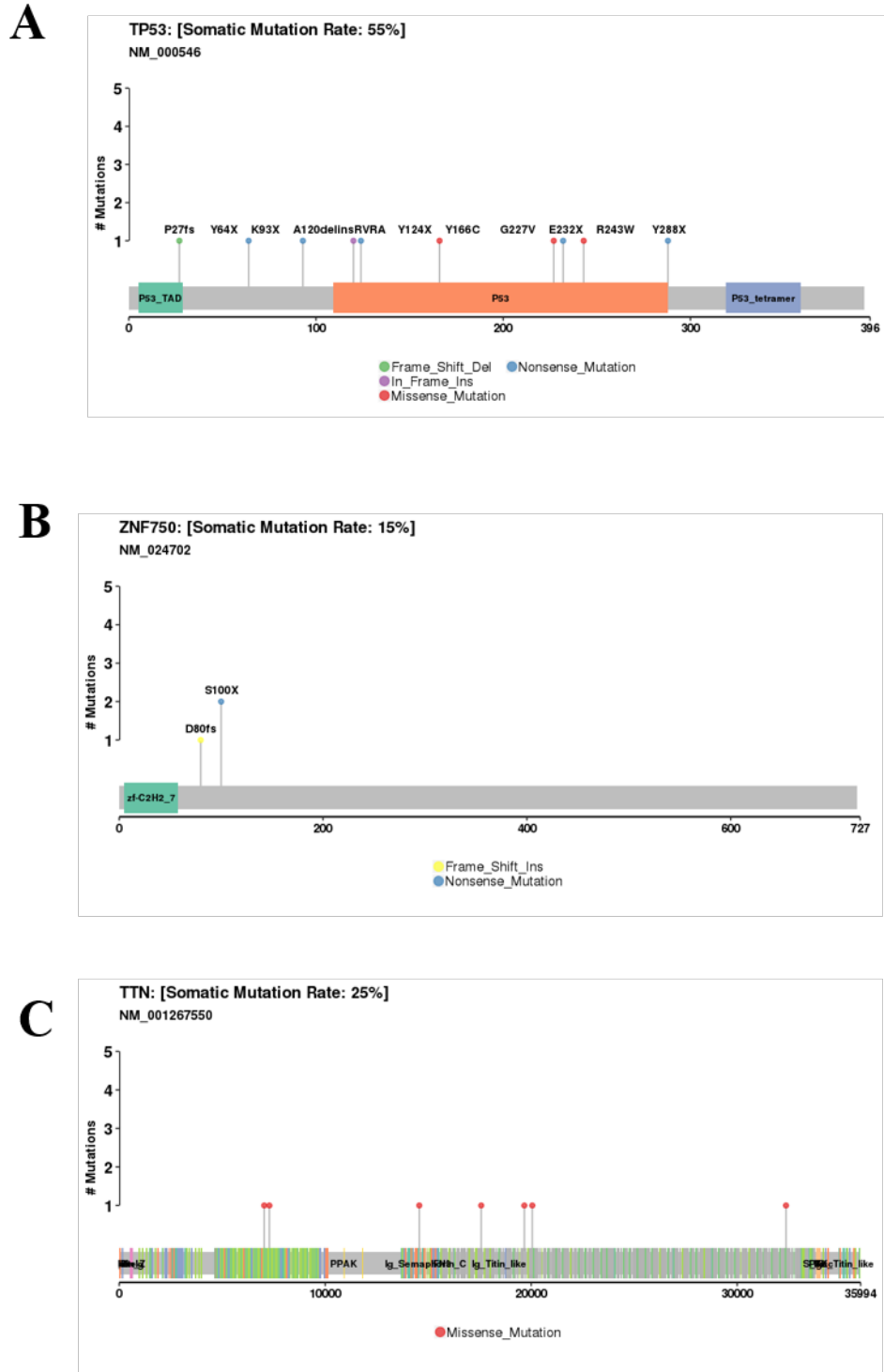


Figure S1: Amino acid changes in *TP53*, *ZNF750* and *TTN*.

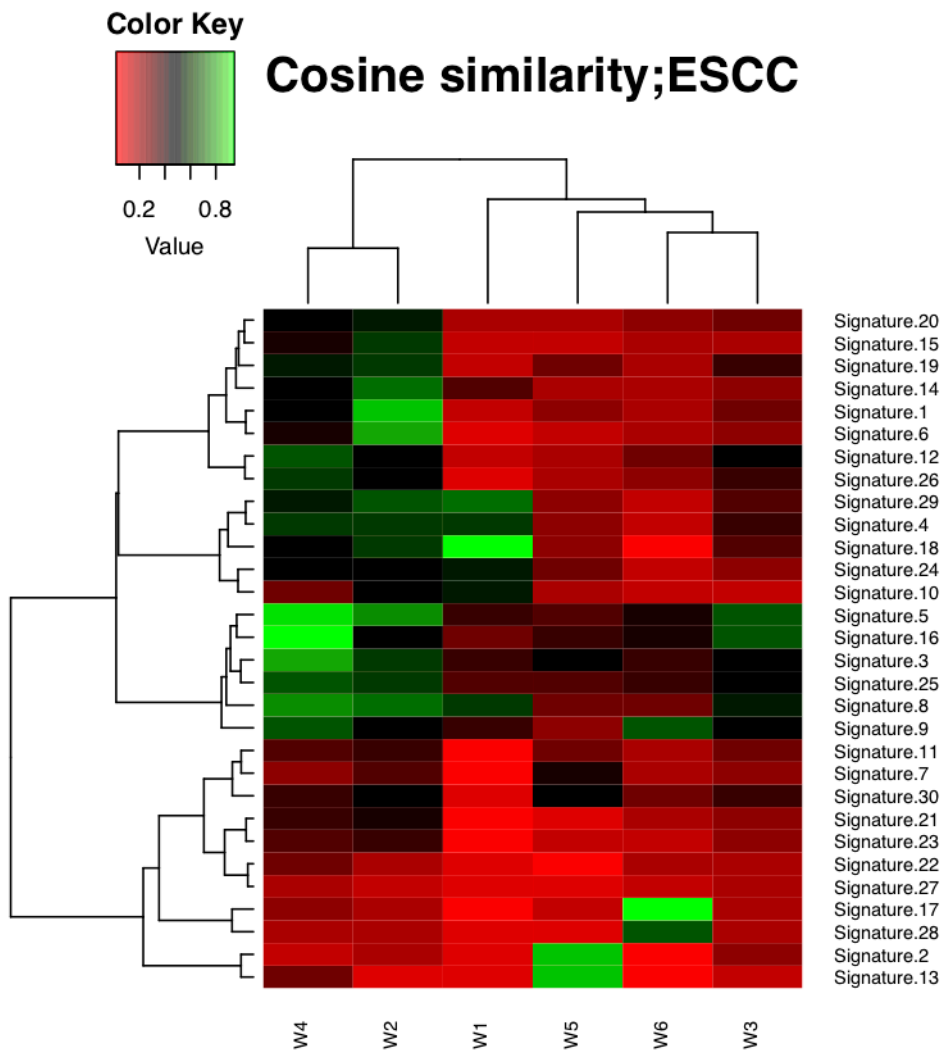
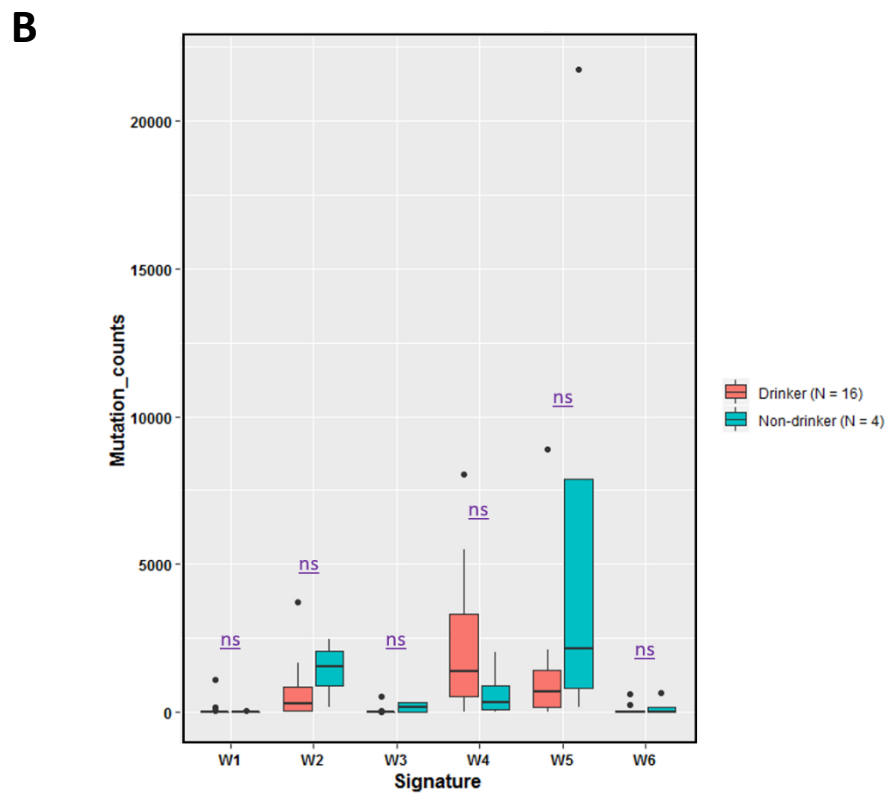
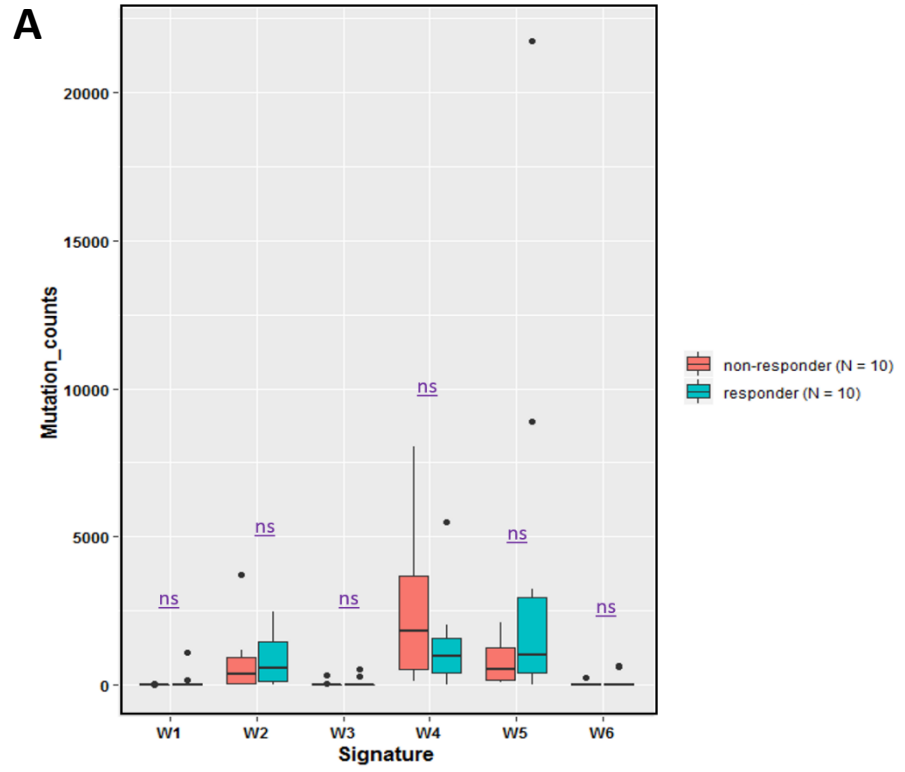


Figure S2: Heatmap showing cosine similarity of mutational signatures in ESCC with COSMIC signatures.



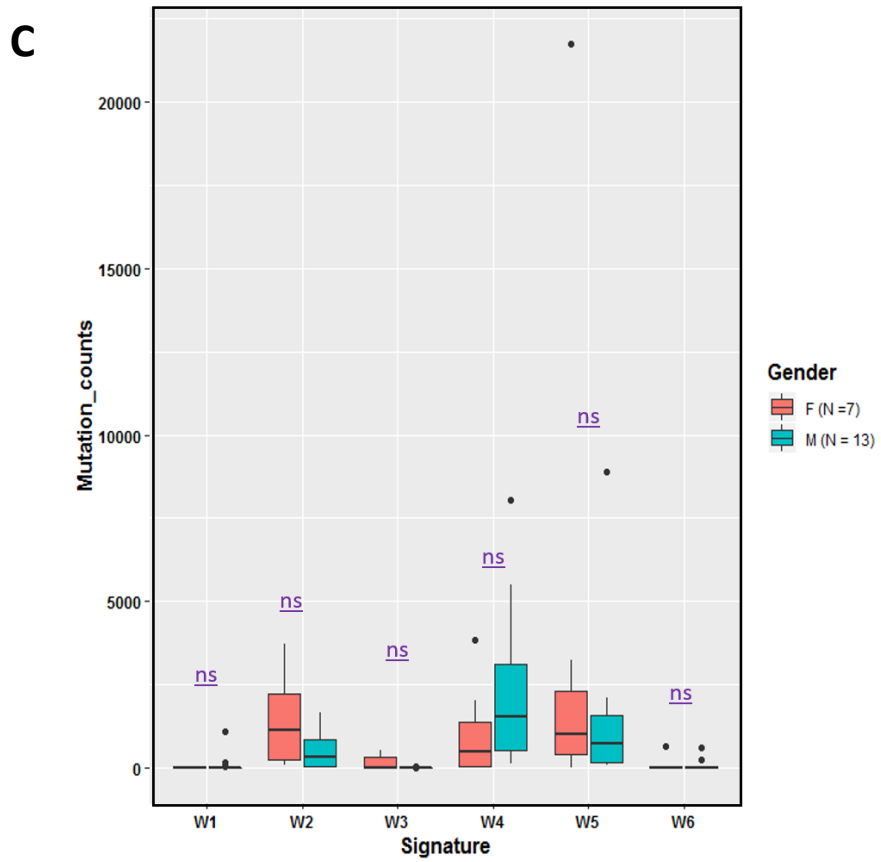


Figure S3: Association between mutational signatures and clinical features. A) Association of mutation signature with response of patients to chemotherapy, B) Association of mutational signatures with alcohol drinking status of patients, C) Association of mutational signatures with gender

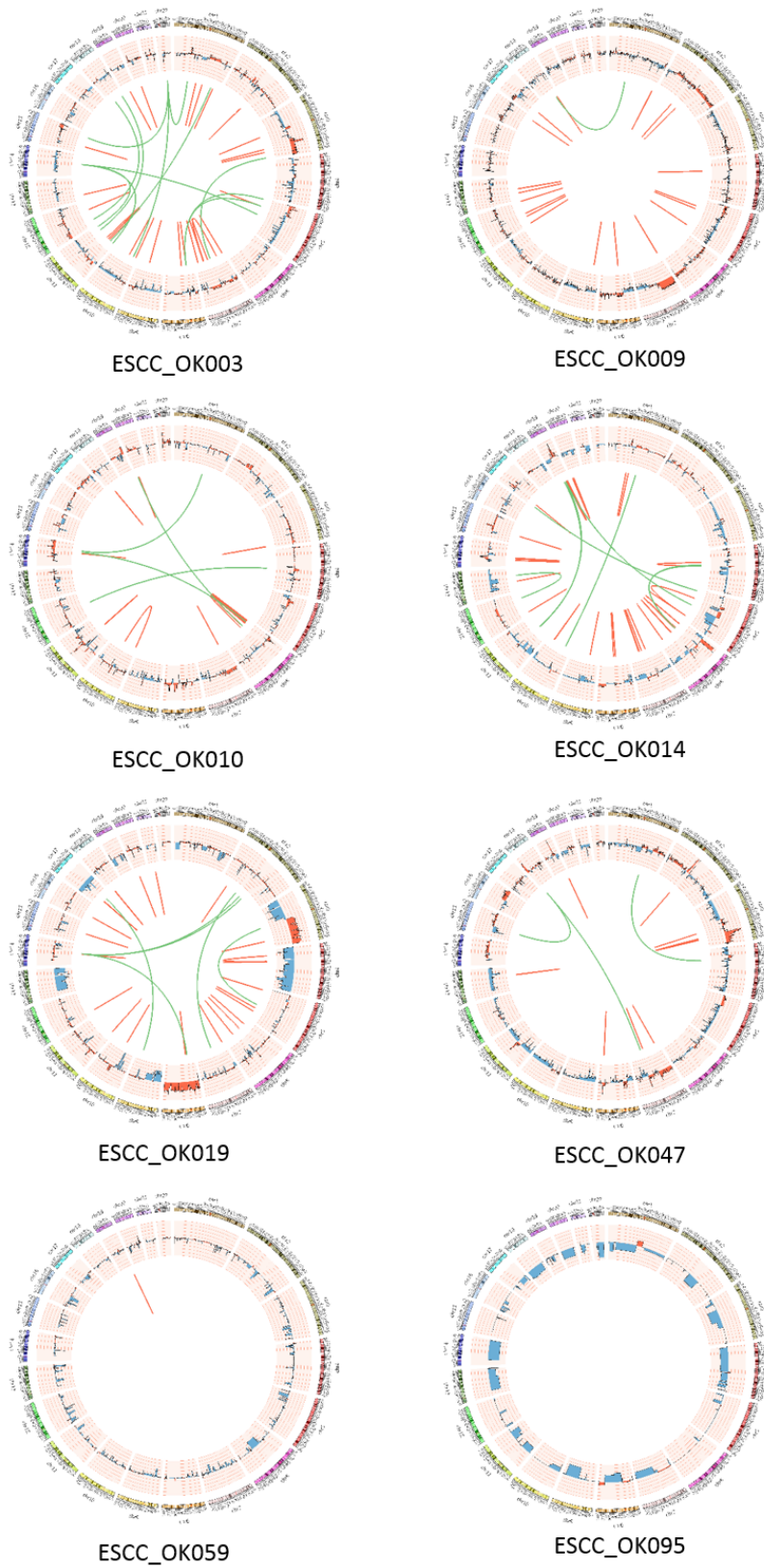


Figure S4: Somatic structural variations in ESCC. Related to Figure 3A.

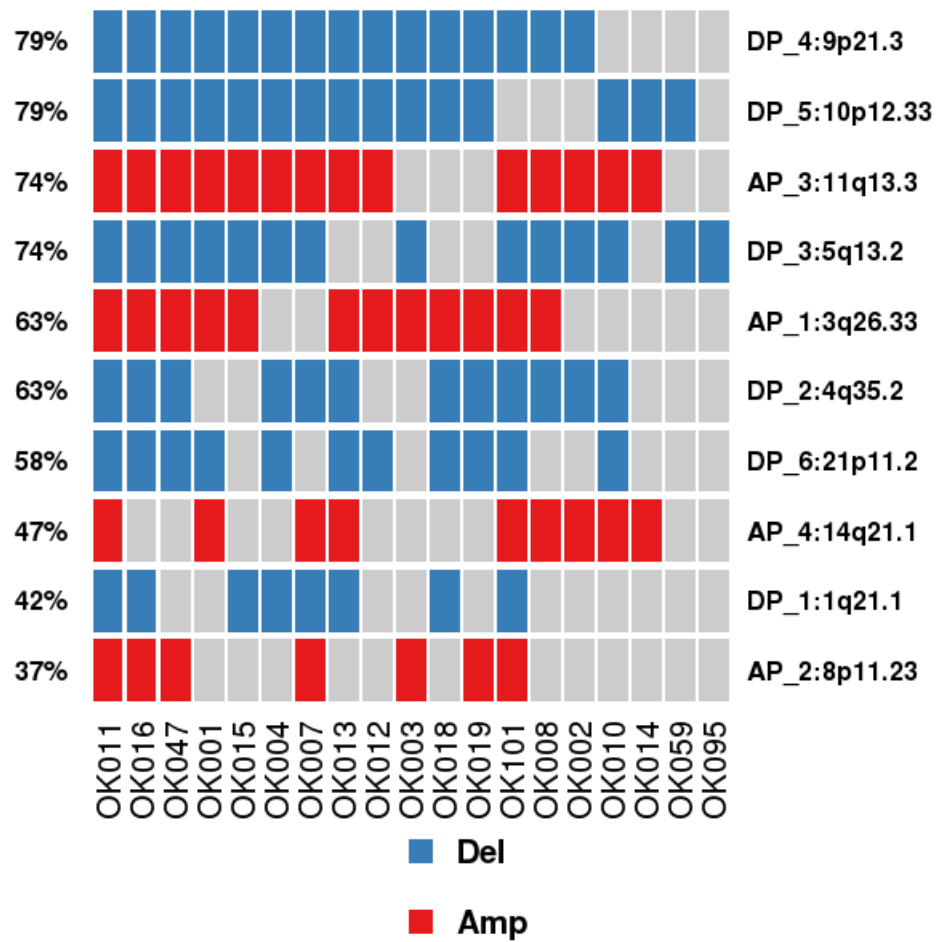


Figure S5: Distributions of copy number alterations in ESCC samples.

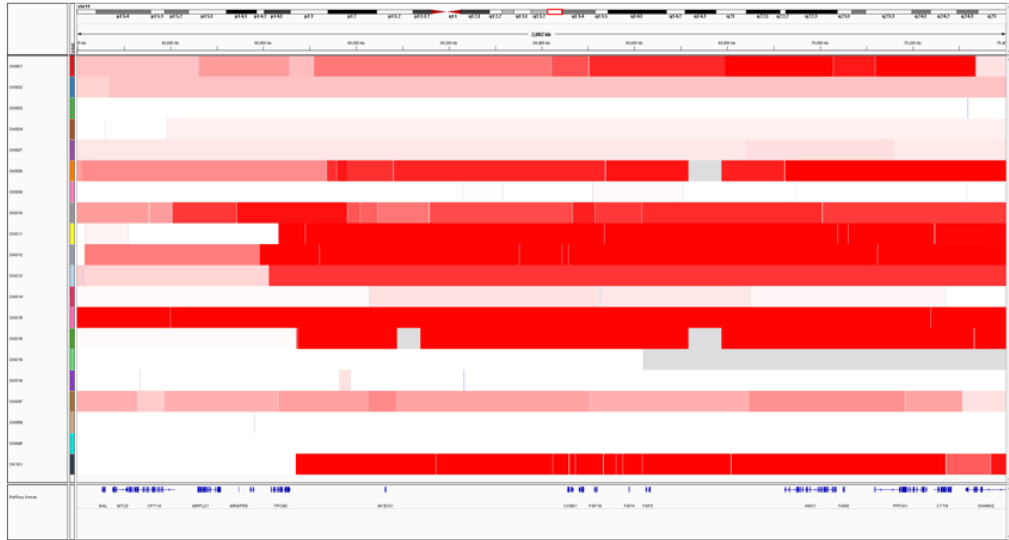
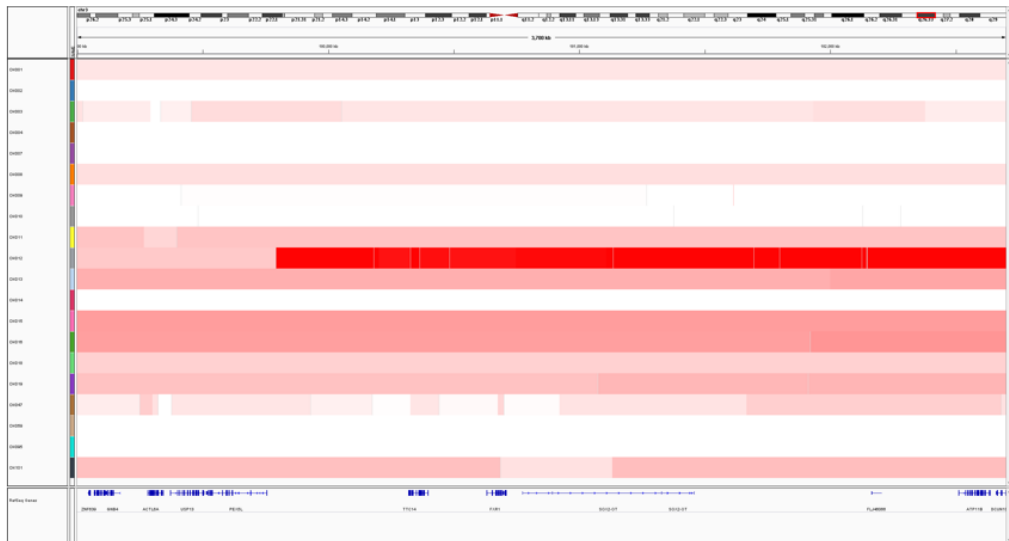
A**B**

Figure S6: Somatic copy number amplification in ESCC. **(A)** Common amplification at *11q13.3*, and **(B)** common amplification at *3q26.33* in all ESCC samples visualized by IGV.

8. SUPPLEMENTARY TABLES

Sample ID	Age	Gender	Smoking	Alcohol Drinking	Histology	Tumor location ¹	cTNM	Clinical Stage (UICC)	Neoadjuvant Therapy ²	Response ³
OK001	60	M	Yes	Yes	SCC	Mt	T4bN1M0	III C	Chemo (DTX+CDDP+5FU)	SD
OK002	63	F	No	Yes	SCC	Mt-Lt	T2N3M1	IV	Chemo (DTX+CDDP+5FU)	PR (nearly CR)
OK003	70	M	Yes	Yes	SCC	Lt	T3N1M0	III A	Chemo (5FU+ADR+CDDP)	SD
OK004	61	M	Yes	Yes	SCC	Ae	T3N1M0	III A	Chemo (5FU+ADR+CDDP)	SD
OK007	57	M	Yes	Yes	SCC	Mt	T3N1M0	III A	Chemo (DTX+CDDP+5FU)	SD
OK008	72	M	Yes	Yes	SCC	Lt	T3N2M0	III B	Chemo (5FU+ADR+CDDP)	SD
OK009	71	M	Yes	Yes	SCC	Ut	T3N0M0	II A	Chemo (5FU+ADR+CDDP)	SD
OK010	76	M	Yes	Yes	SCC	Mt	T3N1M0	III A	Chemo (5FU+ADR+CDDP)	SD
OK011	67	M	Yes	Yes	SCC	Mt	T3N2M1	IV	Chemo (5FU+ADR+CDDP) +Radiation	PR (nearly CR)
OK012	64	M	Yes	Yes	SCC	Mt	T3N1M1	IV	Chemo (5FU+ADR+CDDP)	PR
OK013	69	M	Yes	Yes	SCC	Lt	T3N2M0	III B	Chemo (DTX+CDDP+5FU)	PR
OK014	64	M	Yes	Yes	SCC	Ce-Ut	T3N2M0	III B	Chemo (CDDP+5FU) +Radiation	CR
OK015	64	M	Yes	Yes	SCC	Mt	T4bN1M0	III C	Chemo (CDDP+5FU) +Radiation	PR
OK016	66	F	No	No	SCC	Mt	T3N2M0	III B	Chemo (DTX+CDDP+5FU)	PR
OK018	64	M	Yes	Yes	SCC	Mt	T3N1M0	III A	Chemo (DTX+CDDP+5FU)	SD
OK019	60	F	Yes	Yes	SCC	Mt	T4aN3M1	IV	Chemo (DTX+CDDP+5FU)	SD
OK047	51	F	No	No	SCC	Ut	T1bN1M0	II B	Chemo (DTX+CDDP+5FU)	PR
OK059	73	F	No	Yes	SCC	Mt	T4aN2M0	III C	Chemo (DTX+CDDP+5FU)	PR
OK095	75	F	No	No	SCC	Mt	T4bN1M0	III C	Chemo (CDDP+5FU)	SD
OK101	81	F	No	No	Basaloid SCC	Mt	T3N2M0	III B	Radiation	CR

¹Tumor location: Ce (cervical esophagus), Ut (upper thoracic esophagus), Mt (middle thoracic esophagus), Lt (lower thoracic esophagus), Ae (abdominal esophagus)

²Neoadjuvant therapy: CDDP (cisplatin), DTX (docetaxel), 5FU (5-fluorouracil), ADR (adriamycin)

³Response: CR (complete response), PR (partial response), SD (stable disease), PD (progressive disease)

Table S1: Metadata of the Esophageal Squamous Cell Carcinoma dataset offered by Kindai University Hospital. Pathological description was reviewed by Kindai University Hospital.

Sample ID	#SNVs	#INDELS	#SPLICE_SITE	#SVs
OK001	1294	111	0	53
OK002	1738	3	1	230
OK003	1352	2	0	49
OK004	4726	3	1	104
OK007	10194	10	2	515
OK008	5317	5	1	303
OK009	723	1	0	22
OK010	307	5	0	30
OK011	10125	3	0	133
OK012	2969	4	2	124
OK013	9307	4	2	191
OK014	647	67	0	52
OK015	5135	6	1	145
OK016	6223	6	0	141
OK018	5087	4	2	107
OK019	8957	4	1	399
OK047	4285	2762	0	14
OK059	643	2344	1	1
OK095	1788	2424	1	0
OK101	23717	2755	2	28
Total	104534	10523	17	2641

Table S2: Frequency of different types of mutations in ESCC

ESCC (In this study)	COSMIC (Alexandrov et al.)	Cosine similarity	Correlation with
Signature W1	Signature 18	0.933	Unknown aetiology
Signature W2	Signature 1	0.850	Age
Signature W4	Signature 5	0.868	-
	Signature 16	0.900	Alcohol drinking
Signature W5	Signature 2	0.811	APOBEC signature
	Signature 13	0.835	APOBEC signature
Signature W6	Signature 17	0.945	Unknown aetiology

Table S3: Similarity between the mutation signatures in ESCC in this study and in COSMIC database.

Genes	Intrachromosomal SVs			Interchromosomal translocations	Frequency
	Deletions	Tandem Duplications	Inversions		
LRP1B	6	0	1	2	9
ERC1	2	2	1	1	6
SHANK2	0	0	4	2	6
TTC28	0	0	0	6	6
CSMD1	3	1	1	0	5
KCNB2	0	0	1	4	5
PDE4D	3	2	0	0	5
SDK1	4	1	0	0	5
WWOX	4	1	0	0	5
ANKS1B	3	1	0	0	4
ASCC3	3	1	0	0	4
CDKAL1	2	0	2	0	4
GPHN	3	0	0	1	4
MACROD2	2	2	0	0	4
MDGA2	3	0	0	1	4
NAALADL2	3	0	0	1	4
NAP5	4	0	0	0	4
NCKAP5	4	0	0	0	4
PARD3	1	1	1	1	4
UNC5D	0	1	1	2	4
ASTN2	3	0	0	0	3
BAZ1A	2	0	0	1	3
C5orf36	1	0	1	1	3
CDH13	2	1	0	0	3
CDKN2BAS	3	0	0	0	3
CHODL	1	1	0	1	3
CNTN5	1	0	1	1	3
DIAPH3	3	0	0	0	3
DST	3	0	0	0	3
ERBB4	2	1	0	0	3
EYS	1	1	0	1	3
FOXP2	2	0	1	0	3
GNAQ	2	1	0	0	3
GPR39	2	1	0	0	3
IMMP2L	3	0	0	0	3
KIAA0825	1	0	1	1	3
KIAA1680	2	1	0	0	3
KLF5	0	2	0	1	3
KLHL5	1	1	0	1	3
LOC283050	1	1	1	0	3
LOC727677	1	1	1	0	3
LPP	1	1	0	1	3
LRRC4C	1	2	0	0	3
MIR7853	3	0	0	0	3
NEGR1	0	0	0	3	3
RAPH1	1	0	1	1	3
ROBO2	3	0	0	0	3
TP63	0	1	1	0	2
FHIT	2	0	0	0	2
ERC2	0	0	1	1	2

Table S4: List of high-confidence SVs in ESCC. This list represents genes with frequency ≥ 3 . The only exceptions are [*TP63*, *FHIT*, and *ERC2*] which have frequency 2.

Sample ID	Response type	Age	Gender	Smoking	Alcohol drinking	Tumor stage
WVOX						
OK004	Non-responder	61	M	Yes	Yes	III A
OK007	Non-responder	57	M	Yes	Yes	III A
OK008	Non-responder	72	M	Yes	Yes	III B
OK009	Non-responder	71	M	Yes	Yes	II A
OK013	Responder	69	M	Yes	Yes	III B
CSMD1						
OK007	Non-responder	57	M	Yes	Yes	III A
OK008	Non-responder	72	M	Yes	Yes	III B
OK011	Responder	67	M	Yes	Yes	IV
OK012	Responder	64	M	Yes	Yes	IV
OK013	Responder	69	M	Yes	Yes	III B
LRP1B						
OK003	Non-responder	70	M	Yes	Yes	III A
OK004	Non-responder	61	M	Yes	Yes	III A
OK009	Non-responder	71	M	Yes	Yes	II A
OK011	Responder	67	M	Yes	Yes	IV
OK012	Responder	64	M	Yes	Yes	IV
OK101	Responder	81	F	No	No	III B
TTC28						
OK001	Non-responder	60	M	Yes	Yes	III C
OK002	Responder	63	F	No	Yes	IV
OK003	Non-responder	70	M	Yes	Yes	III A
OK012	Responder	64	M	Yes	Yes	IV
OK016	Responder	66	F	No	No	III B
OK018	Non-responder	64	M	Yes	Yes	III A
ERC1						
OK007	Non-responder	57	M	Yes	Yes	III A
OK008	Non-responder	72	M	Yes	Yes	III B
OK009	Non-responder	71	M	Yes	Yes	II A
OK015	Responder	64	M	Yes	Yes	III C
OK016	Responder	66	F	No	No	III B
PDE4D						
OK002	Responder	63	F	No	Yes	IV
OK007	Non-responder	57	M	Yes	Yes	III A
OK008	Non-responder	72	M	Yes	Yes	III B
OK009	Non-responder	71	M	Yes	Yes	II A
OK013	Responder	69	M	Yes	Yes	III B
SDK1						
OK003	Non-responder	70	M	Yes	Yes	III A
OK007	Non-responder	57	M	Yes	Yes	III A
OK009	Non-responder	71	M	Yes	Yes	II A
OK013	Responder	69	M	Yes	Yes	III B
OK019	Non-responder	60	F	Yes	Yes	IV
SHANK2						
OK001	Non-responder	60	M	Yes	Yes	III C
OK010	Non-responder	76	M	Yes	Yes	III A
OK012	Responder	64	M	Yes	Yes	IV
OK015	Responder	64	M	Yes	Yes	III C
OK016	Responder	66	F	No	No	III B

Table S5: SV affected genes with their clinical features in ESCC.

Cytoband	11q13.3	8p11.23	3q26.33	14q21.1
q value	1.81E-18	0.0021696	0.1049	0.20007
residual q value	1.81E-18	0.0021696	0.1049	0.20007
wide peak boundaries	chr11:69139803-70337712	chr8:37130908-38642625	chr3:174782313-197866225	chr14:37604182-39475278
genes in wide peak	hsa-mir-548k, CCND1, CTTN, FGF3, FGF4, PPIA1, FADD, FGF19, SHANK2, ANO1, ORAOV1, MIR548K	ADRB3, EIF4EBP1, FGFR1, STAR, TACC1, ASH2L, BAG4, ERLIN2, PROSC, DDHD2, GPR124, LSM1, WHSC1L1, BRF2, ZNF703, RAB11FIP1, PPAPDC1B, GOT1L1, LETM2, RNF5P1, C8orf86, LOC728024	hsa-mir-922, hsa-mir-570, hsa-mir-3137, hsa-mir-944, hsa-mir-28, hsa-mir-1248, hsa-mir-1224, ACTL6A, AHSB, APOD, BCL6, BDH1, AP2M1, CLCN2, CPN2, CRYGS, DGKG, DLG1, DVL3, EHHADH, EIF4A2, EIF4G1, EPHB3, ETV5, FGF12, GP5, HRG, HES1, IL1RAP, KNG1, LPP, MFI2, MUC4, INDUFB5, OPA1, PAK2, PCYT1A, PIK3CA, POLR2H, PPP1R2, MASP1, PSMD2, RFC4, SNORA63, RPL35A, TRA2B, ST6GAL1, SOX2, SST, TFR3, THPO, FXR1, TP63, CHR1, EIF2B5, USP13, CLDN1, MAP3K13, ADIPOQ, KIAA0226, ECE2, ABCG5, TNK2, ALG3, KCNMB2, IGF2BP2, CLDN16, NCBP2, MCF2L2, ATP11B, VPS8, ACAP2, UBXN7, FETUB, LAMP3, KCNMB3, ZNF639, PEX5L, DNAJB11, DCUN1D1, KLHL24, PIGX, TBCCD1, LEPREL1, ABCF3, LSG1, PARL, MFN1, YEATS2, MCC1, HRASL5, MRPL47, SENP2, GNB4, RTP4, MAGEF1, ZMAT3, ATP13A3, TBL1XR1, MAP6D1, PIGZ, B3GNT5, IQCG, ATP13A4, FYT1D1, MGC2889, LRCH3, CEP19, LMLN, KLHL6, VWA5B2, TMEM41A, TMEM44, CAMK2N2, TM4SF19, RPL39L, DNAJC19, FAM131A, ZDHHC19, LRRC15, FAM43A, TMEM207, RTP1, TTC14, MB21D2, XXYLT1, CCDC50, PYDC2, LOC152217, RNF168, HTR3C, LIPH, HTR3D, OSTalpha, FBXO45, MUC20, SENP5, LOC220729, LOC253573, NAALADL2, TCTEX1D2, C3orf43, SDHAP1, UTS2D, HTR3E, C3orf70, TPRG1, CCDC39, LOC339926, LPP-AS2, LOC344887, RTP2, OSTN, ATP13A5, SOX2-OT, WDR53, ANKRD18DP, LRRC33, FUJ46066, FLJ42393, FLJ34208, LOC401109, SNORD2, SNORA4, C3orf65, GMNC, LOC647323, SNORA81, SNORD66, MIR570, SDHAP2, MIR922, MIR944, LOC100128023, LOC100131551, LOC100131635, SNAR-I, MIR1224, MIR1248, LOC100505687, MFI2-AS1, LOC100507086, LOC100507391, TM4SF19-TCTEX1D2, MIR4797, MIR4789	FOXA1, SSTR1, SLC25A21, MIPOL1, CLEC14A, LOC283547, LOC100129794

Table S6: GISTIC2.0 results: Amplified regions. List of genes found in the significantly amplified regions in ESCC where CNA analysis results was used as input.

Cytoband	9p21.3	4q35.2	21p11.2	1q21.1	5q13.2	10p12.33
q value	1.84E-16	0.020509	0.0258	0.094528	0.098682	0.17696
residual q value	1.84E-16	0.020509	0.0258	0.094528	0.094528	0.17696
wide peak boundaries	chr9:21858227-22003939	chr4:160075932-191154276	chr21:1-10910683	chr1:143157361-143876792	chr5:61850191-74535166	chr10:17734827-18325764
genes in wide peak	CDKN2A, C9orf53	hsa-mir-1305, hsa-mir-4276, hsa-mir-548t, hsa-mir-1979, AGA, SLC25A4, CASP3, CLCN3, CPE, DCTD, F11, ACSL1, FAT1, FRG1, GK3P, GPM6A, HMGB2, HPGD, HSP90AA4P, ING2, IRF2, KLKB1, MTNR1A, NEK1, NPY1R, NPY5R, MSMO1, TLL1, TLR3, VEGFC, GLRA3, SORBS2, SAP30, HAND2, RAPGEF2, MFAP3L, ADAM29, ANXA10, KLHL2, SCRG1, DUX4, PALLD, ANP32C, FAM149A, FBXO8, DUX2, PDLIM3, SPOCK3, AADAT, GALINT7, CLDN22, C4orf27, NEIL3, C4orf43, UFPS2, DDX60, CDKN2AIP, ODZ3, LRP2BP, FSTL5, STOX2, KIAA1430, SH3RF1, SPCS3, TRAPPC11, MLF1IP, NBLA00301, WWC2, CEP44, SNX25, TKTL2, CBR4, MGC45800, DDX60L, NAF1, WDR17, ZFP42, SPATA4,	TEKT4P2, MIR3687, MIR3648	hsa-mir-3118-3, hsa-mir-3118-2, FLJ39739, PPIAL4G, LOC100130000, LOC100286793	TRIM23, BTF3, CCNB1, CDK7, FOXD1, GTF2H2, HEXB, HTR1A, TNPO1, CD180, MAP1B, NAIP, PIK3R1, PMCHL2, RAD17, SMN1, SMN2, TAF9, SERF1A, ENCI, CARTPT, CWC27, NSA2, SMAA4, SMA5, ADAMTS6, MRPS27, PPWD1, FAM169A, GCNT4, SGTB, BDP1, ERBB2IP, NLN, ANKRA2, MCCC2, CENPK, RGNEF, SLC30A5, CENPH, PTCD2, C5orf44, UTP15, GFM2, MRPS36, FCHO2, TMEM171, TMEM174, SREK1, MARVELD2, ZNF366, CCDC125, ANKRD31, RNF180, SREK1IP1, MAST4, RGS7BP, LOC647859, GUSBP3, GTF2H2B, GTF2H2C, SERF1B, GTF2H2D, GUSBP9, LRRC70, FAM159B,	hsa-mir-511-2, hsa-mir-511-1, MRC1, MIR511-1, MIR511-2, TMEM236, LOC100129213

Table S7: GISTIC2.0 results: Deleted regions. List of genes found in the significantly deleted regions in ESCC where CNA analysis results was used as input.

Gene	Drug	Interaction_types	Sources	PMIDs
CCND1	ARSENIC TRIOXIDE	antagonist	TdgClinicalTrial DrugBank	12480548 16387740 17370311 17005224 16230
CCND1	ACETAMINOPHEN	-	NCI	11896290
CCND1	VITAMIN E	-	NCI	14871472
CCND1	CYTARABINE	-	NCI	15936818
CCND1	GOSSYPOL	-	NCI	11510695
CCND1	Roniciclib	-	ClarityFoundationBiomarkers	-
CCND1	Ribociclib	-	ClarityFoundationBiomarkers	-
CCND1	PALBOCICLIB	inhibitor	ClarityFoundationBiomarkers Che	-
CCND1	METHOTREXATE	-	NCI	12972956
CCND1	MYCOPHENOLIC ACID	-	NCI	16123159
CCND1	NIFEDIPINE	-	NCI	10051745
CCND1	TAMOXIFEN	-	NCI CIVIC	12469160 12602925 15138475
CCND1	TROGLITAZONE	-	NCI	14764597
CCND1	URACIL	-	NCI	10607743
CCND1	ABEMACICLIB	-	ClarityFoundationBiomarkers	-
CCND1	BRICICLIB	inhibitor	ChEMBLInteractions	-
FGF3	LUCITANIB	-	CGI	-
FGF3	DOVITINIB	-	CGI	-
FGF3	SORAFENIB	-	CIVIC	22890726
FGF4	PENTOSAN POLYSULFATE SODIUM	inhibitor	TdgClinicalTrial TEND DrugBank	1279186 8738610 1708834
FGF4	RUSALATIDE ACETATE	-	DrugBank	-
FGF4	HEPARIN	-	NCI	11486033
FGF4	LUCITANIB	-	CGI	-
FGF4	DOVITINIB	-	CGI	-
FADD	RIZATRIPTAN	-	NCI	11384965
ANO1	ca2	activator	GuideToPharmacologyInteractions	-
ANO1	ANTHRACENE-9-CARBOXYLIC ACID	channel blocker	GuideToPharmacologyInteractions	-
ANO1	METRONIDAZOLE	channel blocker	GuideToPharmacologyInteractions	-
ANO1	FLUFENAMIC ACID	channel blocker	GuideToPharmacologyInteractions	-
ANO1	FLUOXETINE	channel blocker	GuideToPharmacologyInteractions	-
ANO1	CHEMBL23050	channel blocker	GuideToPharmacologyInteractions	-
ANO1	MIBEFRADIL	channel blocker	GuideToPharmacologyInteractions	-
ANO1	NIFLUMIC ACID	channel blocker	GuideToPharmacologyInteractions	-
ANO1	5-NITRO-2-PHENYLPROPYLAMINO BENZOIC ACID [NPP	channel blocker	GuideToPharmacologyInteractions	-
ANO1	CHEMBL1162149	channel blocker	GuideToPharmacologyInteractions	-
ANO1	TANNIC ACID	channel blocker	GuideToPharmacologyInteractions	-
ANO1	CROFELEMER	blocker antagonist inhibitor	GuideToPharmacologyInteractions	19808995
ADRB3	NOREPINEPHRINE	agonist	DrugBank	8105356 9464897 17139284 8106131 17016423 8097243
ADRB3	PROPRANOLOL	antagonist	GuideToPharmacologyInteractions	20231523 11752352
ADRB3	ISOPRENALINE	agonist	GuideToPharmacologyInteractions	10722 10824635
ADRB3	ARBUTAMINE	agonist	DrugBank	8723169
ADRB3	FENOTEROL	agonist	DrugBank	14730417
ADRB3	CLENBUTEROL	agonist	DrugBank	20590599
ADRB3	AMIBEGRON	agonist	TdgClinicalTrial GuideToPharmac	-
ADRB3	SOLABEGRON	agonist	TdgClinicalTrial GuideToPharmac	18372395
ADRB3	DROXIDOPA	agonist	ChEMBLInteractions DrugBank	9464897 18064417 19110970 19434307
ADRB3	BOPINDOLOL	-	DrugBank	11752352
ADRB3	BUPRANOLOL	antagonist	GuideToPharmacologyInteractions	12606631 14660028
ADRB3	MIRABEGRON	agonist	TdgClinicalTrial GuideToPharmac	23550899
ADRB3	PURVALANOL B	agonist	TTD	-
ADRB3	OLANZAPINE	-	PharmGKB	-
ADRB3	CHEMBL198927	agonist	GuideToPharmacologyInteractions	-
ADRB3	LINEASTINE	agonist	TTD	-
ADRB3	CHEMBL3186106	agonist	TTD	-
ADRB3	RITOBEGRON	agonist	TdgClinicalTrial ChEMBLInterac	-
ADRB3	ABEDITEROL	agonist	GuideToPharmacologyInteractions	-
ADRB3	EPINEPHRINE	agonist	GuideToPharmacologyInteractions	-
ADRB3	CHEMBL13990	agonist	GuideToPharmacologyInteractions	-
ADRB3	CARAZOLOL	agonist	GuideToPharmacologyInteractions	-
ADRB3	L-75507	agonist	GuideToPharmacologyInteractions	-
ADRB3	CGP-12177	agonist	GuideToPharmacologyInteractions	-
ADRB3	CARVEDILOL	antagonist	GuideToPharmacologyInteractions	-
ADRB3	CGP-20712A	antagonist	GuideToPharmacologyInteractions	-
ADRB3	CHEMBL198059	antagonist	GuideToPharmacologyInteractions	-
ADRB3	GEMFIBROZIL	antagonist	GuideToPharmacologyInteractions	-
ADRB3	LINOPIRDINE	antagonist	GuideToPharmacologyInteractions	-
ADRB3	LEVOBUNOLOL	antagonist	GuideToPharmacologyInteractions	-
ADRB3	NADOLOL	antagonist	GuideToPharmacologyInteractions	-
ADRB3	CHEMBL1326499	antagonist	GuideToPharmacologyInteractions	-
ADRB3	TERTATOLOL	antagonist	GuideToPharmacologyInteractions	-
ADRB3	LABETALOL HYDROCHLORIDE	antagonist	ChEMBLInteractions	-
ADRB3	DIPIVEFRIN HYDROCHLORIDE	agonist	ChEMBLInteractions	-
ADRB3	MEPENTERMINE SULFATE	agonist	ChEMBLInteractions	-
ADRB3	VIBEGRON	agonist	ChEMBLInteractions	-
ADRB3	RAFABEGRON	agonist	ChEMBLInteractions	-
ADRB3	AMIBEGRON HYDROCHLORIDE	agonist	ChEMBLInteractions	-
ADRB3	EPINEPHRINE BITARTRATE	agonist	ChEMBLInteractions	-
ADRB3	NORADRENALINE	agonist	ChEMBLInteractions	-
ADRB3	LY377604	agonist	ChEMBLInteractions	-
ADRB3	ISOPROTERENOL SULFATE	agonist	ChEMBLInteractions	-
ADRB3	CARTEOLOL HYDROCHLORIDE	antagonist	ChEMBLInteractions	-
ADRB3	ISOPROTERENOL HYDROCHLORIDE	agonist	ChEMBLInteractions	-
ADRB3	CARVEDILOL PHOSPHATE	antagonist	ChEMBLInteractions	-
ADRB3	HYDROXYAMPHETAMINE HYDROBROMIDE	agonist	ChEMBLInteractions	-
EIF4EBP1	PACLITAXEL	-	NCI	15897904
FGFR1	PALIFERMIN	-	TdgClinicalTrial DrugBank	10212269 9890894 11714710 10950949 110917
FGFR1	SORAFENIB	inhibitor	CKB GuideToPharmacologyInterac	25900027 17016424 15466206 16507829
FGFR1	Anlotinib	inhibitor	GuideToPharmacologyInteractions	-

Gene	Drug	Interaction_types	Sources	PMIDs
FGFR1	AZD-4547	inhibitor	TALC MyCancerGenome OncoKB	26351320 23082000 27550940 22837387 26936917 27179038 27535980 25465127 28108151 26359452
FGFR1	INFIGRATINIB	inhibitor	TALC CKB GuideToPharmacology	22837387 26015511 27535980 27870574
FGFR1	BRIVANIB	inhibitor	PharmGKB CKB GuideToPharmacology	22238366
FGFR1	CEP-11981	inhibitor	GuideToPharmacologyInteractions	-
FGFR1	DOVITINIB	inhibitor	TALC MyCancerGenome TdgClinic	22238366 23658459 27315356 17698633
FGFR1	JNJ-42756493	inhibitor	CKB GuideToPharmacologyInteractions	26324363 28341788
FGFR1	LUCITANIB	inhibitor	CKB GuideToPharmacologyInteractions	27126994
FGFR1	LY-2874455	inhibitor	GuideToPharmacologyInteractions	-
FGFR1	MK-2461	inhibitor	GuideToPharmacologyInteractions	-
FGFR1	NINTEGANIB	Inhibitor inhibitor	TALC MyCancerGenome TdgClinic	22238366 18559524
FGFR1	ORANTINIB	inhibitor	MyCancerGenome GuideToPharmacology	-
FGFR1	PAZOPANIB	inhibitor	GuideToPharmacologyInteractions	-
FGFR1	SU-11652	inhibitor	GuideToPharmacologyInteractions	-
FGFR1	SU-14813	inhibitor	GuideToPharmacologyInteractions	-
FGFR1	SUNITINIB	inhibitor	GuideToPharmacologyInteractions	-
FGFR1	CHEMBL315546	-	DrugBank	10592235
FGFR1	XL-999	inhibitor	TdgClinicalTrial ChembliInteractions	-
FGFR1	CHEMBL89363	-	DrugBank	10592235
FGFR1	REGORAFENIB	inhibitor	ChembliInteractions DrugBank MyCancerGenome	-
FGFR1	PONATINIB	inhibitor	TALC MyCancerGenome OncoKB	22238366 23563700 22781593 26055304 26175911 26179511 24771645 23468082
FGFR1	ARSENIC TRIOXIDE	-	NCI	17121903
FGFR1	ALCOHOL	-	NCI	16478533
FGFR1	FINASTERIDE	-	NCI	10386468
FGFR1	XL-228	inhibitor	TALC MyCancerGenome	-
FGFR1	ARQ-087	inhibitor	TdgClinicalTrial CKB ChembliInteractions	-
FGFR1	MASTITINIB	inhibitor	MyCancerGenome	-
FGFR1	ENMD-2076	-	TdgClinicalTrial ClarityFoundation	-
FGFR1	TRAFERMIN	-	TdgClinicalTrial	-
FGFR1	LENVATINIB	-	TdgClinicalTrial CKB	25295214
FGFR1	PD-173074	-	CKB CIViC	22837387 27535980 21666749 21160078
FGFR1	AFIMOXIFENE (CHEMBL489)	-	CIViC	20179196
FGFR1	MIDOSTAURIN	-	CIViC	15448205
FGFR1	ALPELISIB	-	CKB	27126994
FGFR1	TRAMETINIB	-	CKB	27338794
FGFR1	PHA-665752	-	CKB	26351320
FGFR1	BENZONATATE	-	CKB	26359452
FGFR1	AZD-8055	-	CKB	26359452
FGFR1	SIROLIMUS	-	CKB	26359452
FGFR1	ALECTINIB	-	CKB	28476735
FGFR1	CRIZOTINIB	-	CKB	28476735
FGFR1	CEDIRANIB	-	CKB	22238366
FGFR1	GEFITINIB	-	CKB	26936917
FGFR1	SELUMETINIB	-	CKB	26438159
FGFR1	BUPARLISIB	-	CKB	28108151
FGFR1	ETOPOSIDE	-	CKB	23536011
FGFR1	Ro-4987655	-	CKB	26438159
FGFR1	NINTEGANIB ESYLATE	inhibitor	ChembliInteractions	-
FGFR1	BAY-1163877	inhibitor	ChembliInteractions	-
FGFR1	CP-459632	inhibitor	ChembliInteractions	-
FGFR1	Sulfatinib	inhibitor	ChembliInteractions	-
FGFR1	PD-0166285 (CHEMBL3545196)	inhibitor	ChembliInteractions	-
FGFR1	PAZOPANIB HYDROCHLORIDE	inhibitor	ChembliInteractions	-
FGFR1	BRIVANIB ALANINATE	inhibitor	ChembliInteractions	-
FGFR1	ENMD-981693	inhibitor	ChembliInteractions	-
FGFR1	TG100-801	inhibitor	ChembliInteractions	-
FGFR1	RG-1530	inhibitor	ChembliInteractions	-
PLPBP	PYRIDOXAL PHOSPHATE	cofactor	DrugBank	17139284 17016423
PLPBP	L-PROLINE	-	DrugBank	17139284 17016423
ACTL6A	CHEMBL225155	agonist	GuideToPharmacologyInteractions	-
APOD	ETRETINATE	-	NCI	8943263
BCL6	FENRETINIDE	-	NCI	11027625
BCL6	ONALESPIB	-	CGI	-
BDH1	CHEMBL1161866	-	DrugBank	8533882 2550053 17139284 17016423 38961
CLCN2	LUBIPROSTONE	activator inducer	ChembliInteractions TEND DrugBank	20345211 17509103 17519292 19236188 17263187 17053162 15991886 11752352 18686757 17413599
CLCN2	COBIPROSTONE	activator	ChembliInteractions	-
DGKG	DEXFOSFOSERINE	-	DrugBank	16905533
EHHADH	CHEMBL1161866	-	DrugBank	17139284 17016423
EPHB3	VANDETANIB	inhibitor	ChembliInteractions	-
ETV5	TRAMETINIB	-	CIViC	28178529
HES1	TRETINOIN	-	NCI	12080040
KNG1	HYDROCHLOROTHIAZIDE	-	PharmGKB	-
NDUFB5	ME-344	inhibitor	ChembliInteractions	-
NDUFB5	NV-128	inhibitor	ChembliInteractions	-
NDUFB5	CHEMBL1161866	-	DrugBank	17139284 17016423
NDUFB5	METFORMIN HYDROCHLORIDE	inhibitor	ChembliInteractions	-
PAK2	SELEGLINE	inhibitor	GuideToPharmacologyInteractions	-
PAK2	STAUROSPORINE	inhibitor	GuideToPharmacologyInteractions	-
PCYT1A	CHOLINE	product of	DrugBank	17184542 17218027
PIK3CA	GSK-1059615	inhibitor	CKB ChembliInteractions	-
PIK3CA	WX-037	inhibitor	ChembliInteractions	-
PIK3CA	PF-04691502	inhibitor	ClarityFoundationBiomarkers MyCancerGenome	21750219
PIK3CA	GEDATOLISIB	inhibitor	ClarityFoundationBiomarkers MyCancerGenome CKB DrugBank	24042735 25977343 24823695 17314276 25688157 21325073
PIK3CA	PILARALISIB (CHEMBL3218575)	inhibitor	MyCancerGenome CKB DrugBank	24166903 25637314 21216929
PIK3CA	VOXTALISIB	inhibitor	ClarityFoundationBiomarkers MyCancerGenome	24583798 24634413
PIK3CA	WORTMANNIN	inhibitor	GuideToPharmacologyInteractions	10592235

Gene	Drug	Interaction_types	Sources	PMIDs
PIK3CA	RALOXIFENE	-	NCI	11901050
PIK3CA	SIROLIMUS	-	CKB NCI CIVIC	15647370 15878982 26882569 28514312 19029981 17376864
PIK3CA	RESVERATROL	-	NCI	15925284
PIK3CA	ETRETINATE	-	NCI	15020266
PIK3CA	STREPTOZOTOCIN	-	NCI	16130182
PIK3CA	SULINDAC	-	NCI	12654560
PIK3CA	SURAMIN	-	NCI	15833899
PIK3CA	VINCRIStINE	-	NCI	12874004
PIK3CA	ZINC SULFATE	-	NCI	15715661
PIK3CA	AZD-5363	-	OncoKB CKB CIVIC	26116361 23258740 19755509 24088382 22294718 23394218
PIK3CA	FULVESTRANT	-	OncoKB CKB	27672108 25877889 25172762 22653967 27174596 21169255 23721513 21362200 22355357 22188813 23136191 22065080 20881279 24076665 24900266 24561032 24608574 23850807 24310736 22049316 23726034 23258246 22340590 23662903 23903756 24244612
PIK3CA	COPANLISIB	inhibitor	ClarityFoundationBiomarkers MyCancerGenome CKB Chemb Int Interactions	27672108 25877889 25172762 22653967 21169255 23721513 24170767 21362200 22355357 22188813 23136191 22065080 20881279 24076665 24900266 24561032 24608574 23850807 24310736 22049316 23726034 23258246 22340590 23662903 23903756 24244612
PIK3CA	TRASTUZUMAB	-	OncoKB CKB CGI CIVIC	25877889 17936563 22915751 23275335 21676217 24470511 27687302 23085766 25425103 26469692 22188813 27126994 28167203 24900266 23940356 20453058 26245675 22294718 22915752 23726034 21558396 24198241 27402769 23903756
PIK3CA	OLAPARIB	-	OncoKB CKB	25877889 26909613 22915751 23275335 23085766 25425103 22188813 27126994 24900266 22915752 23726034 24198241 27402769 23903756
PIK3CA	EVEROLIMUS	-	ClarityFoundationBiomarkers OncoKB CKB CGI CIVIC	25877889 26951309 23629727 27797976 22915751 23275335 20664174 20664172 23085766 25425103 27893038 22188813 27126994 24900266 21358673 27091708 22915752 23726034 22662154 24198241 27402769 23903756
PIK3CA	Ribociclib	-	OncoKB CIVIC	25877889 22915751 23275335 23085766 25425103 22188813 27126994 24900266 22915752 23726034 24198241 27402769 25002028 23903756
PIK3CA	LETROZOLE	-	OncoKB CKB	25877889 22915751 23275335 23085766 25425103 22188813 27126994 24900266 22915752 23726034 24198241 27402769 23903756
PIK3CA	DS-7423	inhibitor	ClarityFoundationBiomarkers CKB	24504419
PIK3CA	INK-1117	inhibitor	MyCancerGenome CKB Chemb Int Interactions	28490463
PIK3CA	MLN-1117	inhibitor	Chemb Int Interactions	-
PIK3CA	RECLISIB	inhibitor	Chemb Int Interactions	-
PIK3CA	Panulisib	inhibitor	CKB Chemb Int Interactions	25700704
PIK3CA	PKI-179	inhibitor	CKB Chemb Int Interactions	20797855
PIK3CA	PWT-33587	inhibitor	Chemb Int Interactions	-
PIK3CA	RG-7666	inhibitor	Chemb Int Interactions	-
PIK3CA	SONOLISIB	inhibitor	MyCancerGenome CKB Chemb Int Interactions	22693357
PIK3CA	SF-1126	inhibitor	MyCancerGenome Tdg ClinicalTrial	-
PIK3CA	PWT-33579	inhibitor	Chemb Int Interactions	-
PIK3CA	RIGOSERTIB	-	Tdg ClinicalTrial CKB	23873848 27104980
PIK3CA	DOCETAXEL	-	PharmGKB	-
PIK3CA	SAR-260301	inhibitor	CancerCommons	-
PIK3CA	BAY-1082439	inhibitor	CKB Chemb Int Interactions	-
PIK3CA	BGT-226 (CHEMBL3545096)	inhibitor	Chemb Int Interactions	-
PIK3CA	GSK-2636771	inhibitor	MyCancerGenome	-
PIK3CA	HERBIMYCIN	-	NCI	11139143
PIK3CA	Puquitinib	inhibitor	Chemb Int Interactions	-
PIK3CA	MIDOSTAURIN	-	NCI	11719451
PIK3CA	BUPARLISIB HYDROCHLORIDE	inhibitor	MyCancerGenome ClinicalTrial	-
PIK3CA	TEMSIROLIMUS	-	ClarityFoundationBiomarkers CKB Chemb Int Interactions	27893038 22271473 22245973 19706758 25527417 21216929 21289267 27016228
PIK3CA	CETUXIMAB	-	CKB CGI CIVIC	26715098 25714871 28446642 25724520 25838391 20619739 19223544 28424201 27002107
PIK3CA	PANITUMUMAB	-	CIVIC	19223544
PIK3CA	PERIFOSINE	-	CIVIC	19706758
PIK3CA	MK-2206	-	CKB CIVIC	26187616 23888070 26627007 26084990 21289267 22932669
PIK3CA	LAPATINIB	-	CKB CIVIC	27687302 26270481 26627007 23940356 26245675 22294718 26920887
PIK3CA	CABOZANTINIB	-	CIVIC	25242168
PIK3CA	PALBOCICLIB	-	CKB CIVIC	27020857 25002028 26369631
PIK3CA	TRAMETINIB	-	CKB	27659046 27797976 26882569 26469692 26627007 26369631
PIK3CA	BEVACIZUMAB	-	CKB	27893038 23940356 21216929 25363205
PIK3CA	SORAFENIB	-	CKB	23629727 25363205
PIK3CA	FLUOROURACIL	-	CKB	25714871 22336586 28424201
PIK3CA	NERATINIB	-	CKB	26627007 26333383 26243863
PIK3CA	ARQ-092	-	CKB	26469692
PIK3CA	BAY-1125976	-	CKB	27699769
PIK3CA	TRASTUZUMAB EMTANSINE	-	CKB	26920887
PIK3CA	PD-0325901	-	CKB	26272063 24339963 21325073

Gene	Drug	Interaction_types	Sources	PMIDs
PIK3CA	ALPELISIB	inhibitor	ClarityFoundationBiomarkers My	27672108 25877889 25172762 22915751 23275335 22653967 27974663 23085766 21169255 23721513 25425103 21362200 22355357 27602501 22188813 27126994 26627007 23136191 22065080 20881279 24076665 24900266 24561032 24608574 27451907 23850807 24310736 22049316 22915752 23726034 26013318 24198241 23258246 22340590 27402769 27604488 23662903 28119489 23903756 24244612
PIK3CA	AMG-319	inhibitor	GuideToPharmacologyInteractions	-
PIK3CA	APITOLISIB	inhibitor	MyCancerGenome CKB GuideToPharmacologyInteractions	26951309 26787751 21998291
PIK3CA	AZD-6482	inhibitor	CKB GuideToPharmacologyInteractions	-
PIK3CA	AZD-8186	inhibitor	GuideToPharmacologyInteractions	-
PIK3CA	CANDICIDIN	inhibitor	CKB GuideToPharmacologyInteractions	26839307
PIK3CA	BUPARLISIB	inhibitor	MyCancerGenome OncoKB CKB GuideToPharmacologyInteractions	27672108 25877889 26715098 25172762 26909613 22915751 23275335 22653967 22159814 27974663 24470511 23085766 21169255 23721513 25425103 21362200 22355357 22188813 27126994 23136191 22065080 20881279 24076665 24900266 23940356 28539475 24561032 24608574 23850807 24310736 22049316 26098748 22915752 23726034 26013318 24198241 23258246 22340590 27402769 23662903 28119489 23903756 24244612
PIK3CA	PA-799	inhibitor	CKB GuideToPharmacologyInteractions	25231405 21558396
PIK3CA	CUDC-907	inhibitor	CKB GuideToPharmacologyInteractions	22693356 20570890
PIK3CA	DACTOLISIB	inhibitor	ClarityFoundationBiomarkers My	21966435 26272063 23629727 22543857 27974663 23475782 26270481 28446642 24939055 23619167 26627007 19029981 26232337 24927217 26013318 22662154 26137449
PIK3CA	DUVELISIB	inhibitor	GuideToPharmacologyInteractions	-
PIK3CA	PHENMETRAZINE	inhibitor	OncoKB CKB GuideToPharmacologyInteractions	27672108 25877889 25172762 22653967 21169255 23721513 23258740 21362200 22355357 22188813 23136191 22065080 20881279 24076665 24900266 24561032 22294718 24608574 23394218 23850807 24310736 22049316 23726034 23258246 26137449 22340590 21668414 23662903 23903756 24244612
PIK3CA	IDELALISIB	inhibitor	CKB GuideToPharmacologyInteractions	26466009 26137449
PIK3CA	INK-128	inhibitor	OncoKB CKB GuideToPharmacologyInteractions	25877889 26272063 25261369 22915751 23275335 27974663 23085766 25425103 22188813 27126994 24900266 22915752 23726034 24198241 27402769 23903756
PIK3CA	OXAZEPAM	inhibitor	GuideToPharmacologyInteractions	-
PIK3CA	CHEMBL1086377	inhibitor	GuideToPharmacologyInteractions	-
PIK3CA	LY-294002	inhibitor	CKB GuideToPharmacologyInteractions	18262558
PIK3CA	LY-3023414	inhibitor	CKB GuideToPharmacologyInteractions	27439478
PIK3CA	OMIPALISIB	inhibitor	ClarityFoundationBiomarkers CKB GuideToPharmacologyInteractions	26603258
PIK3CA	PI-103	inhibitor	MyCancerGenome CKB GuideToPharmacologyInteractions	22336586
PIK3CA	CHEMBL568150	inhibitor	GuideToPharmacologyInteractions	-
PIK3CA	CHEMBL1231533	inhibitor	GuideToPharmacologyInteractions	-
PIK3CA	PICITILISIB	inhibitor	MyCancerGenome CKB GuideToPharmacologyInteractions	27489350 23674493 27174596 24601221 22084396 27020857 23888070 23136191 24339963 27197306 26058079 27604488 27196766 28119489
PIK3CA	PILARALISIB (CHEMBL3360203)	inhibitor	GuideToPharmacologyInteractions	-
PIK3CA	CHEMBL1081312	inhibitor	GuideToPharmacologyInteractions	-
PIK3CA	YOHIMBINE	inhibitor	OncoKB GuideToPharmacologyInteractions	27672108 25877889 25172762 22915751 23275335 22653967 23085766 21169255 23721513 25425103 21362200 22355357 22188813 27126994 23136191 22065080 20881279 24076665 24900266 24561032 24608574 23850807 24310736 22049316 22915752 23726034 24198241 23258246 22340590 27402769 23662903 23903756 24244612
PIK3CA	TASELISIB	inhibitor	MyCancerGenome OncoKB CKB GuideToPharmacologyInteractions	27672108 25877889 25172762 22653967 21169255 23721513 28331003 21362200 22355357 22188813 23136191 22065080 26333883 20881279 24076665 24900266 24561032 24608574 23850807 24310736 22049316 23726034 26589432 23258246 22340590 23662903 23903756 24244612
PIK3CA	TG100-115	inhibitor	GuideToPharmacologyInteractions	-
PIK3CA	VS-5584	inhibitor	CKB GuideToPharmacologyInteractions	23270925
PIK3CA	ZSTK-474	inhibitor	ClarityFoundationBiomarkers CKB GuideToPharmacologyInteractions	26137449
PIK3CA	CHEMBL126955	-	NCI	16267832
PIK3CA	CAMPTOTHECIN	-	CKB NCI	24042735 12464623 25688157
PIK3CA	CARBOPLATIN	-	CKB NCI	16275998 21216929
PIK3CA	IRINOTECAN	-	CKB NCI	24042735 16707468 15809721 25714871 213251501480
PIK3CA	PRASTERONE	-	NCI	15501480
PIK3CA	DOXORUBICIN	-	CKB NCI	16905201 27893038 12761490
PIK3CA	ALVOCIDIB	-	NCI	14767524
PIK3CA	REGRAMOSTIM	-	NCI	15107457
PIK3CA	INDOLE-3-CARBINOL	-	NCI	11948137
PIK3CA	MILTEFOSINE	-	NCI	16752184
PIK3CA	PACLITAXEL	-	CKB NCI	26469692 24170767 12761490 26245675 2121617045724
PIK3CA	QUERCETIN	inhibitor	MyCancerGenome NCI	17045724
PIK3CA	RALOXIFENE	-	NCI	11901050
PIK3CA	SIROLIMUS	-	CKB NCI CIVIC	15647370 15878982 26882569 28514312 19029981 17376864

Gene	Drug	Interaction_types	Sources	PMIDs
PIK3CA	LUCITANIB	-	CKB	27126994
PIK3CA	AZD-8055	-	CKB	28446642 22271687
PIK3CA	SELUMETINIB	-	CKB	26272063 22271687 24939055 21358673 26232337 26137449
PIK3CA	AT-13148	-	CKB	22781553
PIK3CA	A-443654	-	CKB	24978597 19208828 24569089
PIK3CA	NAVITOCLOX	-	CKB	27659046 27197306
PIK3CA	DEGUELIN	-	CKB	24978597 20811676
PIK3CA	IPATASERTIB	-	CKB	24141624
PIK3CA	CHEMBL263664	-	CKB	21191045
PIK3CA	GEMCITABINE	-	CKB	28750271
PIK3CA	UPROSERITIB	-	CKB	-
PIK3CA	CC-223	-	CKB	24978597 25855786 26177599
PIK3CA	OSI-027	-	CKB	21673091
PIK3CA	Acalisib	-	CKB	-
PIK3CA	CHEMBL1765740	-	CKB	27451907
PIK3CA	CHEMBL428462	-	CKB	24978597 20423992
PIK3CA	MSC-2363318A	-	CKB	27186432
PIK3CA	CAPECITABINE	-	CKB	26920887
PIK3CA	REGORAFENIB	-	CKB	23629727 25838391
PIK3CA	PIMASERTIB	-	CKB	23629727
PIK3CA	LY-2780301	-	CKB	28750271 25902900
PIK3CA	FLOXURIDINE	-	CKB	25714871
PIK3CA	COBIMETINIB	-	CKB	22084396
PIK3CA	CHEMBL589258	-	CKB	20371716
PIK3CA	VENETOCLAX	-	CKB	27974663
PIK3CA	U-0126	-	CKB	21358673
PIK3CA	VEMURAFENIB	-	CKB	24265153 26137449
PIK3CA	TAK-733	-	CKB	26439693
PIK3CA	METFORMIN	-	CKB	23986086
PIK3CA	TAMOXIFEN	-	CKB	26116361
PIK3CA	TORIN1	-	CKB	27974663
PIK3CA	RIDAFOROLIMUS	-	CKB	26187616
PIK3CA	AFURESERITIB	-	CKB	24978597
PIK3CA	BENZONATATE	-	CKB	27974663
PIK3CA	AEW-541	-	CKB	27196766
PIK3CA	LINSTINIB	-	CKB	27196766
PIK3CA	PERTUZUMAB	-	CKB	23940356
PIK3CA	DASATINIB	-	CKB	26855149
PIK3CA	DEMCIZUMAB	-	CKB	26855149
PIK3CA	PONATINIB	-	CKB	26270481
PIK3CA	DABRAFENIB	-	CKB	27797976
PIK3CA	CHEMBL376408	-	CKB	27974663
PIK3CA	INFIGRATINIB	-	CKB	28119489
PIK3CA	BORTEZOMIB	-	CKB	21216929
PIK3CA	TOPOTECAN	-	CKB	21216929
PSMD2	OPROZOMIB	inhibitor	TdgClinicalTrial ChembliInteractions	-
PSMD2	CARFILZOMIB	inhibitor	MyCancerGenome ChembliInteractions	-
PSMD2	BORTEZOMIB	inhibitor	MyCancerGenome TdgClinicalTrials	-
PSMD2	IXAZOMIB CITRATE	inhibitor	ChembliInteractions	-
SST	CYSTEAMINE	binder	DrugBank TTD	2653642 2901134 4080089 11752352 6142843
SST	ASPIRIN	-	NCI	6108875
SST	AMPHETAMINE	-	NCI	2874568
SST	CAPTOPRIL	-	NCI	2864479
SST	ESTRADIOL BENZOATE	-	NCI	10211766
SST	GANCICLOVIR	-	NCI	10766345
SST	LITHIUM	-	NCI	2888503
SST	VALPROIC ACID	-	NCI	1972258
SST	STREPTOZOTOCIN	-	NCI	7664670
SST	VALINOMYCIN	-	NCI	6129560
THPO	BUSULFAN	-	NCI	7742532
THPO	ALPROSTADIL	-	NCI	7492761
THPO	UREA	-	NCI	9726418
MAP3K13	CEP-1347	inhibitor	ChembliInteractions	-
MAP3K13	METARAMINOL	inhibitor	GuideToPharmacologyInteractions	-
ADIPOQ	FENOIBRATE	-	NCI	17194889
ADIPOQ	NEVIRAPINE	-	NCI	15305892
ADIPOQ	SPIRONOLACTONE	-	NCI	17142138
ECE2	PYRIMETHAMINE	inhibitor	GuideToPharmacologyInteractions	-
ABCC5	FLUOROURACIL	-	PharmGKB	-
ABCC5	SILDENAFIL	inhibitor	GuideToPharmacologyInteractions	-
TNK2	ADENOSINE TRIPHOSPHATE	-	DrugBank	17139284 17016423
TNK2	DEBROMOHYMNIALDISINE	-	DrugBank	17139284 17016423
TNK2	BOSUTINIB	inhibitor	GuideToPharmacologyInteractions	-
TNK2	DODECANOL	inhibitor	GuideToPharmacologyInteractions	-
KCNMB2	MICONAZOLE	inhibitor	DrugBank	1376313 8760033
KCNMB3	MICONAZOLE	inhibitor	DrugBank	1376313 8760033
P3H2	SUCCINIC ACID	-	DrugBank	17139284 17016423
P3H2	ASCORBATE	-	DrugBank	17139284 17016423
P3H2	L-PROLINE	-	DrugBank	17139284 17016423
MC11	BIOTIN	-	DrugBank	16773504
HTR3C	PUMOSETRAG	-	TdgClinicalTrial	-
HTR3C	TEDATIOXETINE	antagonist	ChembliInteractions	-
HTR3C	RG3487	antagonist	ChembliInteractions	-
HTR3C	CHEMBL1188853	-	TdgClinicalTrial	-
HTR3C	DOLASETRON	-	TdgClinicalTrial	-
HTR3C	GRANISETRON	-	TdgClinicalTrial	-
HTR3D	PUMOSETRAG	-	TdgClinicalTrial	-
HTR3D	DOLASETRON	-	TdgClinicalTrial	-
HTR3D	TEDATIOXETINE	antagonist	ChembliInteractions	-
HTR3D	RG3487	antagonist	ChembliInteractions	-

Gene	Drug	Interaction_types	Sources	PMIDs
HTR3D	GRANISETRON	-	TdgClinicalTrial	-
HTR3D	CHEMBL1188853	-	TdgClinicalTrial	-
HTR3E	CHEMBL1188853	-	TdgClinicalTrial	-
HTR3E	PUMOSETRAG	-	TdgClinicalTrial	-
HTR3E	RG3487	antagonist	ChemblInteractions	-
HTR3E	GRANISETRON	-	TdgClinicalTrial	-
HTR3E	DOLASETRON	-	TdgClinicalTrial	-
HTR3E	TEDATIOXETINE	antagonist	ChemblInteractions	-
SSTR1	OCTREOTIDE	-	TdgClinicalTrial NCI TEND DrugBank	16438887 16223973 15103227 16625842 16625841 8566856
SSTR1	PASIREOTIDE	agonist	TdgClinicalTrial GuideToPharmacology	11980628 17395978
SSTR1	STREPTOZOTOCIN	-	NCI	7956902
SSTR1	ALENDRONIC ACID	agonist	GuideToPharmacologyInteractions	-
SSTR1	CORTISTATIN-14	agonist	GuideToPharmacologyInteractions	-
SSTR1	CHEMBL437348	agonist	GuideToPharmacologyInteractions	-
SSTR1	CHEMBL216992	agonist	GuideToPharmacologyInteractions	-
SSTR1	CHEMBL252764	agonist	GuideToPharmacologyInteractions	-
SSTR1	SOMATOSTATIN	agonist	GuideToPharmacologyInteractions	-
SSTR1	CHEMBL442494	agonist	GuideToPharmacologyInteractions	-
SSTR1	OBELIN	antagonist	GuideToPharmacologyInteractions	-
SSTR1	PASIREOTIDE PAMOATE	agonist	ChemblInteractions	-
SSTR1	LANREOTIDE	-	TdgClinicalTrial TEND	-
SSTR1	PASIREOTIDE DIASPARTATE	agonist	ChemblInteractions	-
SSTR1	OCTREOTIDE ACETATE	agonist	ChemblInteractions	-
SSTR1	CHEMBL539934	agonist	TTD	-
CDKN2A	PALBOCICLIB	-	ClarityFoundationBiomarkers OncoKB CIVIC	26715889 25524798 21278246 22711607 2748531 21871868 24495407 20952405 22983396 26528855 25156567 26380006 26183925 23898052
CDKN2A	LETROZOLE	-	OncoKB CIVIC	26715889 25524798
CDKN2A	Ribociclib	-	ClarityFoundationBiomarkers	-
CDKN2A	Roniciclib	-	ClarityFoundationBiomarkers	-
CDKN2A	ABEMACICLIB	-	ClarityFoundationBiomarkers CKB	27217383 26183925
CDKN2A	ILOASERTIB	-	CGI	-
CDKN2A	PANITUMUMAB	-	CIVIC	23746666
CDKN2A	TRAMETINIB	-	CKB	26343583 27488531 22983396
CDKN2A	GEMCITABINE	-	CKB	25156567
CDKN2A	CHEMBL1231206	-	CKB	26140595
CDKN2A	PF-00477736	-	CKB	26140595
CDKN2A	GSK-461364	-	CKB	25156567
CDKN2A	HMN-214	-	CKB	25156567
CDKN2A	ALVOCIDIB	-	CKB	12777976
CDKN2A	IMATINIB	-	CKB	28514312
CDKN2A	CARBOPLATIN	-	CKB	28514312
CDKN2A	PACLITAXEL	-	CKB	28514312
CDKN2A	INK-128	-	CKB	25261369
CDKN2A	ALECTINIB	-	CKB	28476735
CDKN2A	CRIZOTINIB	-	CKB	28476735
SLC25A4	ADENOSINE TRIPHOSPHATE	-	DrugBank	17210842
SLC25A4	CLODRONATE DISODIUM	inhibitor	DrugBank	11752352 11961144
SLC25A4	PAROMOMYCIN	inhibitor	GuideToPharmacologyInteractions	-
SLC25A4	CLODRONIC ACID	inhibitor	TTD	-
CASP3	CHEMBL417149	inhibitor	GuideToPharmacologyInteractions	-
CASP3	CHEMBL586058	inhibitor	GuideToPharmacologyInteractions	-
CASP3	EMRICASAN	inhibitor	ChemblInteractions DrugBank	-
CASP3	CHEMBL293034	-	DrugBank	10592235
CASP3	CHEMBL310554	-	DrugBank	10592235
CASP3	RIZATRIPTAN	-	NCI	12749243
CASP3	PACLITAXEL	-	NCI	9067280
CASP3	IDRONOXIL	-	ClarityFoundationClinicalTrial	-
CASP3	CELECOXIB	-	PharmGKB	-
CLCN3	PHLORETIN	channel blocker	GuideToPharmacologyInteractions	-
CPE	INSULIN HUMAN	-	DrugBank	17139284 17016423
F11	NONACOG ALFA	ligand	DrugBank	10593931 659613 11342438
F11	CHEMBL273653	inhibitor	GuideToPharmacologyInteractions	-
F11	CONESTAT ALFA	inhibitor	DrugBank	16267649
F11	DEXTRAN SULFATE SODIUM	-	NCI	12968031
F11	THROMBIN	-	NCI	9787166
ACSL1	ADENOSINE PHOSPHATE	product of	DrugBank	17350930 16981708
ACSL1	ADENOSINE TRIPHOSPHATE	-	DrugBank	17139284 17016423
HPGD	CHEMBL1161866	-	DrugBank	17463062
HPGD	IBUPROFEN	-	NCI	16997128
HPGD	SODIUM CHLORIDE	-	NCI	9603077
IRF2	INTERFERON GAMA-1B	-	NCI	10859338
KLKB1	ECALLANTIDE	inhibitor	DrugBank TTD	18613770
KLKB1	CONESTAT ALFA	inhibitor inhibitor	DrugBank	6184384
MTNR1A	RAMELTEON	agonist multitarget	TdgClinicalTrial GuideToPharmacology	17157111 17803013 17389558 15869323 15695169 16173650 16432265 17015817 19768947 11752352 19228178 16730121 19568703
MTNR1A	MELATONIN	binder agonist	TdgClinicalTrial GuideToPharmacology	19449447 15992934 20827520 11752352 20674373 19966183 19463840
MTNR1A	TASIMELTEON	agonist	TdgClinicalTrial GuideToPharmacology	25534555
MTNR1A	AGOMELATINE	agonist	TdgClinicalTrial GuideToPharmacology	15289999
MTNR1A	IODOMELATONIN	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL1788358	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL126809	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL34730	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL127421	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL1946221	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL1802025	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL10009	agonist	GuideToPharmacologyInteractions	-

Gene	Drug	Interaction_types	Sources	PMIDs
MTNR1A	LOMITAPIDE	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL13790	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL237236	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL1094546	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL3260983	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL33549	agonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL285718	antagonist	GuideToPharmacologyInteractions	-
MTNR1A	AZD7325	antagonist	GuideToPharmacologyInteractions	-
MTNR1A	LUZINDOLE	antagonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL12296	antagonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL429392	antagonist	GuideToPharmacologyInteractions	-
MTNR1A	CHEMBL189449	antagonist	GuideToPharmacologyInteractions	-
NEK1	UNDECANOATE	inhibitor	GuideToPharmacologyInteractions	-
NPY1R	CHEMBL435278	-	DrugBank	-
NPY1R	CHEMBL422942	antagonist	TTD	-
NPY5R	CHEMBL435278	-	TdgClinicalTrial DrugBank	-
NPY5R	VELNEPERIT	antagonist	TdgClinicalTrial ChembliInteractio	-
NPY5R	S-237648	antagonist	ChembliInteractions	-
NPY5R	CHEMBL438914	antagonist	TTD	-
NPY5R	FR-79620	antagonist	TTD	-
MSMO1	CHEMBL1161866	-	DrugBank	17139284 17016423
TLR3	HYDROXYCHLOROQUINE	-	NCI	16142732
TLR3	PYROXAMIDE	-	NCI	16670286
TLR3	RINTATOLIMOD	agonist	ChembliInteractions	-
VEGFC	LENALIDOMIDE	-	ClarityFoundationClinicalTrial	-
VEGFC	BEVACIZUMAB	-	PharmGKB ClarityFoundationClin	-
VEGFC	CONBERCEPT	inhibitor	ChembliInteractions	-
VEGFC	SORAFENIB TOSYLATE	inhibitor	MyCancerGenomeClinicalTrial	-
GLRA3	GLYCINE	-	DrugBank	17154252 17550639
GLRA3	LINDANE	antagonist	DrugBank	12614680 20600211
GLRA3	PICROTOXIN	channel blocker antagonist	GuideToPharmacologyInteractions	17714449
GLRA3	IVERMECTIN	agonist	DrugBank	10592235 19336526 17016423 15313134
GLRA3	ZINC ION	allosteric modulator	GuideToPharmacologyInteractions	-
GLRA3	CHEMBL464651	antagonist	GuideToPharmacologyInteractions	-
GLRA3	CHEMBL497392	antagonist	GuideToPharmacologyInteractions	-
GLRA3	NIFEDIPINE	antagonist	GuideToPharmacologyInteractions	-
GLRA3	STRYCHNINE	antagonist	GuideToPharmacologyInteractions	-
GLRA3	WIN-552122	antagonist	GuideToPharmacologyInteractions	-
GLRA3	PICROTOIN	channel blocker	GuideToPharmacologyInteractions	-
GLRA3	PICROTOXININ	channel blocker	GuideToPharmacologyInteractions	-
AADAT	PYRIDOXAL PHOSPHATE	cofactor	DrugBank	15016471 12126930
AADAT	L-GLUTAMATE	-	DrugBank	17139284 17016423 12850557
CDK7	CHEMBL1802728	inhibitor	GuideToPharmacologyInteractions	-
CDK7	PENTOBARBITAL	inhibitor	GuideToPharmacologyInteractions	-
CDK7	MILCICLIB	inhibitor	GuideToPharmacologyInteractions	-
CDK7	RGB-286638	inhibitor	GuideToPharmacologyInteractions	-
CDK7	CHEMBL369507	-	DrugBank	17139284 17016423
CDK7	ALVOCIDIB	inhibitor	MyCancerGenome TdgClinicalTri	11752352
CDK7	RG-547	inhibitor	TTD	-
CDK7	BMS-387032	inhibitor	TdgClinicalTrial ChembliInteractio	-
CDK7	SELCICLIB	inhibitor	MyCancerGenome TdgClinicalTri	-
CDK7	AZD-5438	inhibitor	ChembliInteractions	-
CDK7	PHA-793887	inhibitor	ChembliInteractions	-
CDK7	TG-02	inhibitor	ChembliInteractions	-
CDK7	Roniciclib	inhibitor	ChembliInteractions	-
CDK7	AT-7519	inhibitor	ChembliInteractions	-
HEXB	GLUCONOLACTONE	-	DrugBank	17139284 17016423
HEXB	CHEMBL257158	-	DrugBank	17139284 17016423
HEXB	CISPLATIN (CHEMBL2068237)	-	NCI	2089371 6987030
HEXB	CORTISONE	-	NCI	7388056
HEXB	ESTRAMUSTINE	-	NCI	6795611
HEXB	GENTAMICIN	-	NCI	2876489 8456116
HEXB	OMEPRAZOLE	-	NCI	9593221
HEXB	RABEPRAZOLE	-	NCI	9593221
HEXB	TAMOXIFEN	-	NCI	8577454
HEXB	THYROXINE	-	NCI	7388056
HTR1A	NALUZOTAN	agonist	TdgClinicalTrial ChembliInteractio	-
HTR1A	ELETRIPTAN	agonist	GuideToPharmacologyInteractions	11513839
HTR1A	METHYSERGIDE	agonist	TdgClinicalTrial TEND DrugBank	11049861 14581123 14517765 14501155 18385
HTR1A	CABERGOLINE	agonist	GuideToPharmacologyInteractions	18691132 18992242 10641988
HTR1A	ROPINIROLE	agonist	DrugBank	18691132
HTR1A	ZOLMITRIPTAN	agonist	TdgClinicalTrial GuideToPharmac	11513839
HTR1A	OLANZAPINE	agonist antagonist	TdgClinicalTrial GuideToPharmac	17848919
HTR1A	CLOZAPINE	agonist antagonist	TdgClinicalTrial GuideToPharmac	12564641 12923612 15213359 15261283 12589
HTR1A	LOXAPINE	binder	DrugBank	-
HTR1A	AMOXAPINE	antagonist	DrugBank	1666997
HTR1A	PROPRANOLOL	antagonist	GuideToPharmacologyInteractions	7759768
HTR1A	LISURIDE	agonist	TdgClinicalTrial GuideToPharmac	2887435 1783326 18691132 11224054 1678728 12373423
HTR1A	ERGOTAMINE	agonist	DrugBank	12525272
HTR1A	APOMORPHINE	agonist	GuideToPharmacologyInteractions	18691132
HTR1A	RISPERIDONE	antagonist	GuideToPharmacologyInteractions	11132243
HTR1A	ALPRENOLOL	antagonist	DrugBank	9145928 9806333 8392199 1323650
HTR1A	PINDOLOL	antagonist	GuideToPharmacologyInteractions	10435400 10432475 10331108 10490909 11752352 10088139
HTR1A	ERGOLOID MESYLATES	agonist antagonist	ChembliInteractions DrugBank	2869188 1606351 8786706 10084415
HTR1A	ARIPRAZOLE	agonist antagonist partial agonist	TdgClinicalTrial GuideToPharmac	15257633 15862515 12063084 14647959 14705
HTR1A	PALIPERIDONE	antagonist	GuideToPharmacologyInteractions	11132243
HTR1A	PENBUTOLOL	antagonist	DrugBank	1468487 10942852
HTR1A	YOHIMBINE	antagonist partial agonist	GuideToPharmacologyInteractions	6136920 10611634
HTR1A	ACEPROMAZINE	antagonist	DrugBank	11755134 9760039

Gene	Drug	Interaction_types	Sources	PMIDs
HTR1A	ALVERINE	antagonist	DrugBank	11697552
HTR1A	PIPOTIAZINE	antagonist	DrugBank	11755134 9760039
HTR1A	THIOPROPERAZINE	antagonist	DrugBank	11755134 9760039
HTR1A	LYSERGIDE	agonist	GuideToPharmacologyInteractions	14209776
HTR1A	DAPOXETINE	-	DrugBank	-
HTR1A	BIFEPRUNOX	partial agonist agonist	TdgClinicalTrial ChembllInteraction	17393144 17659474 16237379
HTR1A	FLIBANSERIN	agonist	TdgClinicalTrial GuideToPharmac	26412054 12890707 12177684
HTR1A	ILOPERIDONE	antagonist	TdgClinicalTrial GuideToPharmac	23272794
HTR1A	LESOPITRON	-	DrugBank	15331910 16032484
HTR1A	ROTIHOTINE	agonist	TEND DrugBank	18691132 18704368
HTR1A	PARDOPRUNOX HYDROCHLORIDE	-	DrugBank	-
HTR1A	OSEMOZOTAN	agonist	TdgClinicalTrial ChembllInteraction	-
HTR1A	CARIPRAZINE	agonist partial agonist	DrugBank	26510944
HTR1A	MIANSERIN	blocker	DrugBank	-
HTR1A	VILAZODONE	antagonist agonist	TdgClinicalTrial GuideToPharmac	15507223 12183683
HTR1A	BOPINDOLOL	-	DrugBank	10435400 10432475 10331108 10490909 11752352 10088139
HTR1A	CINITAPRIDE	agonist	DrugBank	9562338 9211565
HTR1A	LURASIDONE	antagonist	TdgClinicalTrial DrugBank	23545936
HTR1A	VORTIOXETINE	agonist	TdgClinicalTrial GuideToPharmac	21486038
HTR1A	BREXIPRAZOLE	agonist partial agonist	TdgClinicalTrial ChembllInteraction	24947465
HTR1A	TIAPRIDE	antagonist	DrugBank	11520476
HTR1A	TRAZODONE	-	TdgClinicalTrial TEND	-
HTR1A	MILNACIPRAN	-	PharmGKB	-
HTR1A	MIRTAZAPINE	-	TEND	-
HTR1A	ASENAPINE (CHEMBL3187365)	agonist	TdgClinicalTrial GuideToPharmac	-
HTR1A	NARATRIPTAN	agonist	TdgClinicalTrial GuideToPharmac	-
HTR1A	GEPIRONE	agonist	TdgClinicalTrial TTD	-
HTR1A	CHEMBL294144	agonist	TdgClinicalTrial TTD	-
HTR1A	XALIPRODEN	antagonist	TdgClinicalTrial TTD	-
HTR1A	BUSPIRONE	agonist	TdgClinicalTrial GuideToPharmac	-
HTR1A	SUMATRIPTAN	agonist	TdgClinicalTrial GuideToPharmac	-
HTR1A	QUETIAPINE	agonist	GuideToPharmacologyInteractions	-
HTR1A	PAROXETINE	-	PharmGKB	-
HTR1A	CHEMBL418854	binder	TTD	-
HTR1A	CHEMBL165679	antagonist	TTD	-
HTR1A	CHEMBL221692	agonist	TTD	-
HTR1A	CHEMBL1188853	agonist	TTD	-
HTR1A	PARDOPRUNOX	agonist	TdgClinicalTrial ChembllInteraction	-
HTR1A	SARIZOTAN	agonist	TTD	-
HTR1A	ZIPRASIDONE	agonist	GuideToPharmacologyInteractions	-
HTR1A	ADATANSERIN	agonist	TTD	-
HTR1A	ABAPERIDONE (CHEMBL151475)	antagonist	TTD	-
HTR1A	GSK163090	antagonist	ChembllInteractions TTD	-
HTR1A	FROVATRIPTAN	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL277120	agonist	GuideToPharmacologyInteractions	-
HTR1A	SEROTONIN	agonist	GuideToPharmacologyInteractions	-
HTR1A	8-OH-DPAT	agonist	GuideToPharmacologyInteractions	-
HTR1A	BMJ-14802	agonist	GuideToPharmacologyInteractions	-
HTR1A	AFTOBETIN	agonist	GuideToPharmacologyInteractions	-
HTR1A	DONITRIPTAN	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL267615	agonist	GuideToPharmacologyInteractions	-
HTR1A	FLESINOXAN	agonist	GuideToPharmacologyInteractions	-
HTR1A	L-694247	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL313714	agonist	GuideToPharmacologyInteractions	-
HTR1A	LY-293284	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL101690	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL3186179	agonist	GuideToPharmacologyInteractions	-
HTR1A	NAFADOTRIDE	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL230963	agonist	GuideToPharmacologyInteractions	-
HTR1A	OCAPERIDONE	agonist	GuideToPharmacologyInteractions	-
HTR1A	QUINPIROLE	agonist	GuideToPharmacologyInteractions	-
HTR1A	RIZATRIPTAN	agonist	GuideToPharmacologyInteractions	-
HTR1A	RU-24969	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL1590266	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL28000	agonist	GuideToPharmacologyInteractions	-
HTR1A	SPIROXATRINE	agonist	GuideToPharmacologyInteractions	-
HTR1A	BEFIRADOL	agonist	GuideToPharmacologyInteractions	-
HTR1A	TANDOSPIRONE	agonist	GuideToPharmacologyInteractions	-
HTR1A	U-92,016-A	agonist	GuideToPharmacologyInteractions	-
HTR1A	XANOMELINE	agonist	GuideToPharmacologyInteractions	-
HTR1A	ZALOSPIRONE	agonist	GuideToPharmacologyInteractions	-
HTR1A	BMJ-7378	agonist	GuideToPharmacologyInteractions	-
HTR1A	BRL-15,572	agonist	GuideToPharmacologyInteractions	-
HTR1A	BROMOCRIPTINE	agonist	GuideToPharmacologyInteractions	-
HTR1A	Capeserod	agonist	GuideToPharmacologyInteractions	-
HTR1A	FLUPAROXAN	agonist	GuideToPharmacologyInteractions	-
HTR1A	GR-127935	agonist	GuideToPharmacologyInteractions	-
HTR1A	IPSAPIRONE	agonist	GuideToPharmacologyInteractions	-
HTR1A	PERGOLIDE	agonist	GuideToPharmacologyInteractions	-
HTR1A	PIRIBEDIL (CHEMBL1371770)	agonist	GuideToPharmacologyInteractions	-
HTR1A	ROXINDOLE	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL41716	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL49247	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL20963	agonist	GuideToPharmacologyInteractions	-
HTR1A	TERGURIDE	agonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL345214	allosteric modulator	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL1255588	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHLORPROMAZINE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CYAMEMAZINE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	FLUSPIRILENE	antagonist	GuideToPharmacologyInteractions	-

Gene	Drug	Interaction_types	Sources	PMIDs
HTR1A	CHEMBL1908856	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL131556	antagonist	GuideToPharmacologyInteractions	-
HTR1A	HALOPERIDOL	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL29027	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL418834	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL326418	antagonist	GuideToPharmacologyInteractions	-
HTR1A	KETANSERIN	antagonist	GuideToPharmacologyInteractions	-
HTR1A	MESORIDAZINE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	METITEPINE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL7318	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL1256701	antagonist	GuideToPharmacologyInteractions	-
HTR1A	PIMOZIDE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	PIPAMPERONE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	PIZOTYLIN	antagonist	GuideToPharmacologyInteractions	-
HTR1A	RACLOPRIDE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	REPINOTAN	antagonist	GuideToPharmacologyInteractions	-
HTR1A	RITANSERIN	antagonist	GuideToPharmacologyInteractions	-
HTR1A	ROBALZOTAN	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL191971	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL183460	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL425190	antagonist	GuideToPharmacologyInteractions	-
HTR1A	SERTINDOLE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	SPIPERONE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL22778	antagonist	GuideToPharmacologyInteractions	-
HTR1A	WAY-100,635	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL286607	antagonist	GuideToPharmacologyInteractions	-
HTR1A	TERTATOLOL	antagonist	GuideToPharmacologyInteractions	-
HTR1A	THIORIDAZINE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	TIOSPIRONE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	CHEMBL38288	antagonist	GuideToPharmacologyInteractions	-
HTR1A	ZOTEPINE	antagonist	GuideToPharmacologyInteractions	-
HTR1A	VORTIOXETINE HYDROBROMIDE	agonist	ChEMBLInteractions	-
HTR1A	ARIPIPRAZOLE LAUROXIL	partial agonist	ChEMBLInteractions	-
HTR1A	PICLOZOTAN	agonist	ChEMBLInteractions	-
HTR1A	LECOZOTAN HYDROCHLORIDE	antagonist	ChEMBLInteractions	-
HTR1A	BUSPIRONE HYDROCHLORIDE	partial agonist	ChEMBLInteractions	-
HTR1A	METHYSERGIDE MALEATE	partial agonist	ChEMBLInteractions	-
HTR1A	SARIZOTAN HYDROCHLORIDE	agonist	ChEMBLInteractions	-
HTR1A	VILAZODONE HYDROCHLORIDE	partial agonist	ChEMBLInteractions	-
PIK3R1	PF-04691502	inhibitor	ClarityFoundationBiomarkers MyCancerGenome ChEMBLInteractions	-
PIK3R1	Puquitinib	inhibitor	ChEMBLInteractions	-
PIK3R1	PA-799	inhibitor	ChEMBLInteractions	-
PIK3R1	ISOPRENALINE	agonist	DrugBank	15110780 15618457 15985706 15381832 15527
PIK3R1	SF-1126	inhibitor	MyCancerGenome ChEMBLInteractions	-
PIK3R1	WORTMANNIN	-	DrugBank	10592235
PIK3R1	GSK-2636771	inhibitor	MyCancerGenome	-
PIK3R1	DS-7423	inhibitor	ClarityFoundationBiomarkers ChEMBLInteractions	-
PIK3R1	OMIPALISIB	inhibitor	ClarityFoundationBiomarkers ChEMBLInteractions	-
PIK3R1	RECLISIB	inhibitor	ChEMBLInteractions	-
PIK3R1	PWT-33587	inhibitor	ChEMBLInteractions	-
PIK3R1	RG-7666	inhibitor	ChEMBLInteractions	-
PIK3R1	VS-5584	inhibitor	ChEMBLInteractions	-
PIK3R1	COPANLISIB	inhibitor	ClarityFoundationBiomarkers MyCancerGenome ChEMBLInteractions	-
PIK3R1	GEDATOLISIB	inhibitor	ClarityFoundationBiomarkers MyCancerGenome ChEMBLInteractions	-
PIK3R1	SONOLISIB	inhibitor	MyCancerGenome ChEMBLInteractions	-
PIK3R1	APITOLISIB	inhibitor	MyCancerGenome ChEMBLInteractions	-
PIK3R1	TASELISIB	inhibitor	ChEMBLInteractions	-
PIK3R1	PILARALISIB (CHEMBL3360203)	inhibitor	ChEMBLInteractions	-
PIK3R1	VOXTALISIB	inhibitor	ClarityFoundationBiomarkers MyCancerGenome ChEMBLInteractions	-
PIK3R1	ZSTK-474	inhibitor	ClarityFoundationBiomarkers ChEMBLInteractions	-
PIK3R1	ALPELISIB	inhibitor	ClarityFoundationBiomarkers MyCancerGenome ChEMBLInteractions	-
PIK3R1	PI-103	inhibitor	MyCancerGenome	-
PIK3R1	QUERCETIN	inhibitor	MyCancerGenome	-
PIK3R1	PILARALISIB (CHEMBL3218575)	inhibitor	MyCancerGenome	-
PIK3R1	WX-037	inhibitor	ChEMBLInteractions	-
PIK3R1	DACTOLISIB	inhibitor	ClarityFoundationBiomarkers MyCancerGenome ChEMBLInteractions	-
PIK3R1	BGT-226 (CHEMBL3545096)	inhibitor	ChEMBLInteractions	-
PIK3R1	PICTILISIB	inhibitor	MyCancerGenome ChEMBLInteractions	-
PIK3R1	BUPARLISIB	inhibitor	MyCancerGenome ChEMBLInteractions	-
PIK3R1	Panulisib	inhibitor	ChEMBLInteractions	-
PIK3R1	GSK-1059615	inhibitor	ChEMBLInteractions	-
PIK3R1	AZD-6482	inhibitor	ChEMBLInteractions	-
PIK3R1	BUPARLISIB HYDROCHLORIDE	inhibitor	MyCancerGenomeClinicalTrial	-
PIK3R1	LY-3023414	inhibitor	ChEMBLInteractions	-
SMN1	ACLARUBICIN	-	NCI	11734549
SMN1	AMIKACIN	-	NCI	15790598
SMN1	PHENYLBUTANOIC ACID	-	NCI	14560316
SMN1	VALPROIC ACID	-	NCI	14595654
CARTPT	AMPHETAMINE	agonist	TdgClinicalTrial DrugBank	15597110 15661821 15680473 16713658 15644956 15680478
CARTPT	DEXAMETHASONE	-	NCI	12591118
CARTPT	PROGESTERONE	-	NCI	18598674
MCCC2	BIOTIN	-	DrugBank	17266990 17659996 17254330 16707089
OCLN	TRETINOIN	-	NCI	15500294

Table S8: Results of Drug-Gene interactions analysis by DGIdb. Target genes were altered by Copy Number Alterations in ESCC.

Gene	Drug	Interaction_types	Sources	PMIDs
LRP1B	DOXORUBICIN	-	CIVIC	22896685
PDE4D	IBUDILAST	inhibitor	DrugBank	16313925
PDE4D	ADENOSINE PHOSPHATE	product of	DrugBank	17088426
PDE4D	OXRIPHILLINE	inhibitor	ChemBlInteractions TTD	-
PDE4D	ROFLUMILAST	inhibitor	ChemBlInteractions DrugBank	17726343 10592235
PDE4D	CHEMBL63859	-	DrugBank	10592235 17139284 17016423
PDE4D	DYPHYLLINE	inhibitor	TdgClinicalTrial ChemBlInteractions TEND	7925603 17139284 17016423
PDE4D	PENTOXIFYLLINE	inhibitor	ChemBlInteractions	-
PDE4D	CHEMBL506972	-	DrugBank	10592235
PDE4D	ISOBUTYLMETHYLXANTHINE	-	DrugBank	10592235
PDE4D	PROPOXYPHENE	inhibitor	GuideToPharmacologyInteractions	-
PDE4D	AMLEXANOX	inhibitor	ChemBlInteractions	-
PDE4D	ROLIPRAM	inhibitor	GuideToPharmacologyInteractions DrugBank	10592235 17139284 17016423
PDE4D	PICLAMILAST	-	DrugBank	10592235 15765929
PDE4D	ETAZOLATE	-	TdgClinicalTrial	-
PDE4D	DIPYRIDAMOLE	inhibitor	ChemBlInteractions	-
PDE4D	CHEMBL1232082	inhibitor	GuideToPharmacologyInteractions	-
PDE4D	COP840	inhibitor	GuideToPharmacologyInteractions	-
PDE4D	ILOPROST	inducer	DrugBank	12952271 11551870 12441759 2461561
PDE4D	THEOPHYLLINE SODIUM GLYCINATE	inhibitor	ChemBlInteractions	-
PDE4D	CHEMBL74078	-	DrugBank	10592235
PDE4D	SODIUM PHENYL BUTYRATE	inhibitor	GuideToPharmacologyInteractions	-
PDE4D	CILOMILAST	inhibitor	DrugBank	17155857 10592235
PDE4D	THEOPHYLLINE	inhibitor	ChemBlInteractions	-
PDE4D	ZARDAVERINE	-	DrugBank	10592235
PDE4D	(-)-ROLIPRAM	-	DrugBank	-
PDE4D	APREMILAST	inhibitor antagonist	GuideToPharmacologyInteractions ChemBl	25864487 17352685
PDE4D	AMINOPHYLLINE	inhibitor	ChemBlInteractions	-
PDE4D	FLAVOXATE HYDROCHLORIDE	inhibitor	ChemBlInteractions	-
PDE4D	CRISABOROLE	inhibitor	ChemBlInteractions DrugBank	-
PDE4D	RESVERATROL	-	TdgClinicalTrial	-
PDE4D	TETOMILAST	-	DrugBank	-
PDE4D	CHEMBL1229585	-	DrugBank	10592235
WWOX	STAUROSPORINE	-	NCI	11058590
WWOX	GEMCITABINE	-	PharmGKB	-
GPHN	PROPIONIC ACID	-	DrugBank	10592235 17139284 17016423
GPHN	FORMIC ACID	-	DrugBank	10592235
KCNB2	DALFAMPRIDINE	blocker channel blocker antagonist	GuideToPharmacologyInteractions ChemBl	16472864
KCNB2	QUININE	channel blocker	GuideToPharmacologyInteractions	-
KCNB2	NERISPIRIDINE	blocker	ChemBlInteractions	-
KCNB2	GUANIDINE HYDROCHLORIDE	blocker	ChemBlInteractions	-
KCNB2	TEDISAMIL	blocker	ChemBlInteractions	-
GNAQ	SELUMETINIB	-	CKB CGI DoCM	2549426 22653968 22808163 18719078 21083380 22253748 19078957 22550165 25157968 1328859 22733540
GNAQ	PD-0325901	-	CKB CIVIC	24141786
GNAQ	PLX-4720	-	CIVIC	24504448
GPR39	ERGOALCIFEROL	agonist	GuideToPharmacologyInteractions	-
GPR39	CHEMBL3092413	agonist	GuideToPharmacologyInteractions	-
GPR39	ZINC ION	agonist	GuideToPharmacologyInteractions	-
ACACA	CHEMBL1562779	inhibitor	GuideToPharmacologyInteractions	-
ACACA	BIOTIN	-	DrugBank	17468269 16636450 16545081 16460018 16707089
EPHA5	VANDETANIB	inhibitor	ChemBlInteractions	-
ERBB4	AFATINIB	inhibitor	CKB CGI DrugBank	27207775
ERBB4	Pozotinib	inhibitor	GuideToPharmacologyInteractions ChemBl	-
ERBB4	PELITINIB	inhibitor	TALC MyCancerGenome	-
ERBB4	CANERTINIB DIHYDROCHLORIDE	inhibitor	ChemBlInteractions	-
ERBB4	AEE-788	inhibitor	GuideToPharmacologyInteractions	-
ERBB4	ERLOTINIB	-	CKB CIVIC	27207775 15329413
ERBB4	AFATINIB DIMALEATE	inhibitor	ChemBlInteractions	-
ERBB4	IBRUTINIB	inhibitor	GuideToPharmacologyInteractions	-
ERBB4	BMS-690514	inhibitor	TALC MyCancerGenome ChemBlInteractio	-
ERBB4	LAPATINIB	-	CKB CGI CIVIC DoCM	25590338 19718025
ERBB4	AC-480	inhibitor	TALC MyCancerGenome TdgClinicalTrial G	-
ERBB4	JNJ-26483327	inhibitor	ChemBlInteractions	-
ERBB4	GEFITINIB	inhibitor	MyCancerGenomeClinicalTrial	-
ERBB4	POTASSIUM CHLORIDE	-	GuideToPharmacologyInteractions	-
ERBB4	ACALABRUTINIB	inhibitor	GuideToPharmacologyInteractions	-
ERBB4	CIMAGLERMIN ALFA	-	TdgClinicalTrial	-
ERBB4	VANDETANIB	inhibitor	ChemBlInteractions	-
ERBB4	OSIMERTINIB MESYLATE	inhibitor	ChemBlInteractions	-
ERBB4	DACOMITINIB HYDRATE	inhibitor	ChemBlInteractions	-
ERBB4	CAPREOMYCINE	-	GuideToPharmacologyInteractions	-
ERBB4	CHEMBL1229592	inhibitor	GuideToPharmacologyInteractions	-
ERBB4	DACOMITINIB	inhibitor	TALC MyCancerGenome TdgClinicalTrial G	-
ERBB4	RABEPRAZOLE	-	GuideToPharmacologyInteractions	-
FANCC	MITOMYCIN	-	CIVIC	16243825
FANCC	CHLORAMBUCIL	-	CIVIC	16243825
FANCC	GEMCITABINE	-	CIVIC	16243825
FANCC	MELPHALAN	-	CIVIC	16243825
FHIT	FRUCTOSE	-	DrugBank	17139284 17016423
FHIT	TRICHOSTATIN	-	NCI	17019711
ITPR1	GLYCERIN	-	DrugBank	10592235 17139284 17016423
ITPR1	NITROPRUSSIDE	antagonist	TTD	-
NTRK2	CEP-2563	inhibitor	ChemBlInteractions	-
NTRK2	PILOCARPINE	-	NCI	15183516
NTRK2	MK-2461	inhibitor	GuideToPharmacologyInteractions	-
NTRK2	CHEMBL2007421	inhibitor	GuideToPharmacologyInteractions	-
NTRK2	AZD-7451	inhibitor	ChemBlInteractions	-
NTRK2	AZD-6918	inhibitor	ChemBlInteractions	-
NTRK2	PLX-7486	inhibitor	ChemBlInteractions	-
NTRK2	LESTAURTINIB	inhibitor	TdgClinicalTrial ChemBlInteractions	-
NTRK2	LITHIUM	-	NCI	16300803
NTRK2	ENTRECTINIB	-	OncoKB	26216294 28183697
NTRK2	CORTICOTROPIN	-	NCI	11360665
NTRK2	DOXORUBICIN	-	NCI	12438277
NTRK2	CEP-11981	inhibitor	GuideToPharmacologyInteractions	-
NTRK2	ALTIRATINIB	inhibitor	ChemBlInteractions	-
NTRK2	CYCLOSPORINE	-	NCI	11516824

NTRK2	DITIOCARB	-	NCI	17052849
NTRK2	LOXO-101	inhibitor	ChembInteractions	-
PDE7A	FLAVOXATE HYDROCHLORIDE	inhibitor	ChembInteractions	-
PDE7A	PENTOXIFYLLINE	inhibitor	ChembInteractions	-
PDE7A	CHEMBL484928	inhibitor	GuideToPharmacologyInteractions	-
PDE7A	CRISABOROLE	inhibitor	GuideToPharmacologyInteractions	-
PDE7A	DIPYRIDAMOLE	inhibitor	ChembInteractions	-
PDE7A	DYPHYLLINE	inhibitor	TdgClinicalTrial TEND DrugBank	17139284 17016423
PDE7A	ISOBUTYLMETHYLXANTHINE	-	DrugBank	10592235
PDE7A	CHEMBL1236215	-	DrugBank	10592235
CDK14	Roniciclib	inhibitor	ChembInteractions	-
CDK14	AT-7519	inhibitor	ChembInteractions	-
CDK14	AZD-5438	inhibitor	ChembInteractions	-
CDK14	PHA-793887	inhibitor	ChembInteractions	-
PRKG1	IPATASERTIB	inhibitor	GuideToPharmacologyInteractions	-
PRKG1	GSK-690693	inhibitor	GuideToPharmacologyInteractions	-
PTPN4	ALENDRONIC ACID	-	TEND	-
PTPRB	SUNITINIB	-	CIVIC	24633157
PTPRB	CHEMBL379000	-	DrugBank	10592235
PTPRD	TEPROTUMUMAB	-	CIVIC	23800680
PTPRD	CUCURBITACIN I	-	CIVIC	26267899
PTPRD	CIXUTUMUMAB	-	CIVIC	23800680
PVT1	IMATINIB MESYLATE	-	NCI	15251464
RPTOR	INK-128	inhibitor	MyCancerGenome	-
RPTOR	OSI-027	inhibitor	MyCancerGenome	-
RPTOR	AZD-8055	inhibitor	MyCancerGenome	-
ACAN	ILOMASTAT	-	DrugBank	10592235
ACVR1	DORSOMORPHIN	-	DrugBank	10592235
ACVR1	ADENOSINE TRIPHOSPHATE	-	DrugBank	17139284 17016423
ACVR1	CHEMBL3186227	inhibitor	GuideToPharmacologyInteractions	-
ADAM17	ADERBASIB	-	TdgClinicalTrial	-
ADAM17	APRATASITAT	inhibitor	GuideToPharmacologyInteractions	-
ADAM17	CHEMBL489100	inhibitor	GuideToPharmacologyInteractions	-
ADAM17	CHEMBL410462	-	DrugBank	10592235
ADAM17	ILOMASTAT	inhibitor	GuideToPharmacologyInteractions	-
ADAM17	CHEMBL1630098	inhibitor	TTD	-
ADAM17	CHEMBL207729	-	DrugBank	10592235
ADAM17	CHEMBL148169	inhibitor	GuideToPharmacologyInteractions DrugBank	10592235
ADAM17	CHEMBL202839	-	DrugBank	10592235
ADAM17	CHEMBL402747	-	DrugBank	10592235
ADAM17	CHEMBL514958	inhibitor	TTD	-
ADAM17	CHEMBL527018	-	DrugBank	10592235
ADAM17	CHEMBL243024	-	DrugBank	10592235
ADK	DIDANOSINE	-	NCI	3262616
ADK	ADENOSINE PHOSPHATE	product of	DrugBank	18560757 17065073
ADK	CHEMBL216697	-	DrugBank	10592235
ADK	BUSULFAN	-	NCI	6317371
ADK	CHEMBL23094	-	NCI	3262616
ADK	LOMUSTINE	-	NCI	6317371
ADK	RIBAVIRIN	activator	DrugBank	15917509 17379518
ADK	DACARBAZINE	-	NCI	6317371
ADK	BLEOMYCIN (CHEMBL3039590)	-	NCI	6317371
ADK	5-iodo,5'-deoxytubercidin	-	DrugBank	10592235
ADK	CHEMBL1591918	inhibitor	GuideToPharmacologyInteractions	-
ADK	CHEMBL66089	inhibitor	GuideToPharmacologyInteractions	-
AKR1C1	GONADOTROPIN, CHORIONIC	-	NCI	436730
AKR1C1	EPITESTOSTERONE	-	DrugBank	10592235
AKR1C1	ESTRONE	-	NCI	3859707
AKR1C1	SALICYLIC ACID	inhibitor	DrugBank	18045204
AKR1C1	CHEMBL1232243	-	DrugBank	18045204
AKR1C1	CHEMBL1161862	-	DrugBank	10592235 17139284 17016423
AKR1C1	ASPIRIN	inhibitor	DrugBank	18045204
AKR1C1	PROGESTERONE	-	NCI	6584862 12604236 3463506 2547059 6950669 3859707 179793 6288675
AKR1C1	CHEMBL1161866	-	DrugBank	3463506 11060293 17139284 2615366 17016423
AMPD1	FOLIC ACID	-	PharmGKB	-
ANGPT1	TREBANANIB	inhibitor	ChembInteractions	-
ANO1	MIBEFRADIL	channel blocker	GuideToPharmacologyInteractions	-
ANO1	TANNIC ACID	channel blocker	GuideToPharmacologyInteractions	-
ANO1	CHEMBL23050	channel blocker	GuideToPharmacologyInteractions	-
ANO1	ca2	activator	GuideToPharmacologyInteractions	-
ANO1	METRONIDAZOLE	channel blocker	GuideToPharmacologyInteractions	-
ANO1	CHEMBL1162149	channel blocker	GuideToPharmacologyInteractions	-
ANO1	NIFLUMIC ACID	channel blocker	GuideToPharmacologyInteractions	-
ANO1	FLUOXETINE	channel blocker	GuideToPharmacologyInteractions	-
ANO1	FLUFENAMIC ACID	channel blocker	GuideToPharmacologyInteractions	-
ANO1	CROFELEMER	blocker antagonist inhibitor	GuideToPharmacologyInteractions Chemb	19808995
ANO1	5-NITRO-2-PHENYLPROPYLAMINO BENZOIC ACID	channel blocker	GuideToPharmacologyInteractions	-
ANO1	ANTHRACENE-9-CARBOXYLIC ACID	channel blocker	GuideToPharmacologyInteractions	-
ASIC2	CHEMBL185515	channel blocker	GuideToPharmacologyInteractions	-
ASIC2	LITHIUM	-	PharmGKB	-
ASIC2	AMILORIDE	channel blocker	GuideToPharmacologyInteractions	-
ASIC2	GADDOBENATE DIMETHYLUMINE	activator	GuideToPharmacologyInteractions	-
ASIC2	LIXOXIN A4	agonist	GuideToPharmacologyInteractions	-
ASIC2	PYRIMETHAMINE	channel blocker	GuideToPharmacologyInteractions	-
ASIC2	CHEMBL482796	agonist	GuideToPharmacologyInteractions	-
ASIC2	NAFAMOSTAT	channel blocker	GuideToPharmacologyInteractions	-
ATP2A2	ENOXACIN	inhibitor	GuideToPharmacologyInteractions	-
ATP2A2	ISTAROXIME	-	TdgClinicalTrial	-
ATP2A2	CELECOXIB	-	PharmGKB	-
ATP2A3	CELECOXIB	-	PharmGKB	-
BCHE	MIVACURIUM	-	DrugBank	8922768
BCHE	EDROPHONIUM	inhibitor	DrugBank	9398183 1438284
BCHE	MALATHION	inhibitor	DrugBank	10592235 17139284 16782587 17016423 16716398 17364237
BCHE	HEXAFLUORENIUM BROMIDE	-	TdgClinicalTrial TEND	-
BCHE	DIPIVEFRIN	potentiator	DrugBank	8446367

BCHE	HEXAFLUORENIUM	inhibitor	DrugBank	11752352 948350
BCHE	RIVASTIGMINE TARTRATE	inhibitor	ChembIInteractions	-
BCHE	SUCCINYLCHOLINE CHLORIDE	-	PharmGKB	-
BCHE	TRIAMCINOLONE	-	NCI	7937594
BCHE	CHEMBL1208337	-	DrugBank	10592235
BCHE	ISOFUROPHATE	inhibitor	TdgClinicalTrial TEND DrugBank	11405252 12459190 1511344 1776688 2361169
BCHE	PYRIDOSTIGMINE	inhibitor	GuideToPharmacologyInteractions	-
BCHE	BAMBUTEROL	inhibitor	GuideToPharmacologyInteractions	-
BCHE	DONEPEZIL	-	NCI	15989517 16083542
BCHE	BUPIVACAINE	-	NCI	14631501
BCHE	IRINOTECAN	-	NCI	11345644
BCHE	DEMECARIUM	inhibitor	DrugBank	7196602 8430939
BCHE	PHENOTHIAZINE	-	NCI	12443046
BCHE	PHENSERINE	inhibitor	DrugBank	15620572
BCHE	ECHOTHIOPHATE IODIDE	inhibitor	TdgClinicalTrial TEND TTD	-
BCHE	CHOLINE	product of	DrugBank	16376069 16297435 17390078 17636231 17329059
BCHE	PHYSOSTIGMINE	inhibitor	GuideToPharmacologyInteractions	-
BCHE	CHEMBL215344	-	DrugBank	10592235 17139284 17016423
BCHE	BUTANOIC ACID	-	DrugBank	-
BCHE	RIVASTIGMINE	inhibitor	TdgClinicalTrial GuideToPharmacologyInteractions	-
BCHE	TACRINE	inhibitor	GuideToPharmacologyInteractions DrugBank	16860785 12871155 10375753 17218977
BCHE	SUXAMETHONIUM	-	FDA	-
BCHE	TACRINE HYDROCHLORIDE	inhibitor	ChembIInteractions	-
BCHE	ECHOTHIOPHATE	inhibitor	DrugBank	2481033 11752352
BCHE	DEMECARIUM BROMIDE	-	TdgClinicalTrial TEND	-
BIRC2	CHEMBL3108827	antagonist	GuideToPharmacologyInteractions	-
BIRC2	CHEMBL2063869	antagonist	GuideToPharmacologyInteractions	-
BIRC2	CHEMBL504559	antagonist	GuideToPharmacologyInteractions	-
BIRC2	BIRINAPANT	inhibitor antagonist	TALC ClarityFoundationClinicalTrial GuideToPharmacologyInteractions	-
BIRC2	CHEMBL2431768	inhibitor antagonist	TALC GuideToPharmacologyInteractions	-
BIRC2	CHEMBL481422	inhibitor	GuideToPharmacologyInteractions	-
BLVRA	CHEMBL1161866	-	DrugBank	17402939
BLVRA	URSODIOL	activator	TTD	-
BRCA2	PHENYLTHIOUREA	-	CIVIC	24240112
BRCA2	OLAPARIB	-	ClarityFoundationBiomarkers OncoKB CKB CIVIC	23346317 75 26510020 26546619 20609467 20609468 25366685 19553641 20406929 1682772 28792849 25218906 322 28578601 21862407 26116172 21097693 15
BRCA2	VELIPARIB	-	ClarityFoundationBiomarkers CKB CGI	26801247 25589624 26842236
BRCA2	CARBOPLATIN	-	CKB CIVIC	25847936
BRCA2	NIRAPARIB	-	ClarityFoundationBiomarkers OncoKB CKB CIVIC	28229583 27717299 27908594
BRCA2	CEDIRANIB	-	CIVIC	25218906
BRCA2	RUCAPARIB	-	ClarityFoundationBiomarkers OncoKB CKB CIVIC	28229583 27717299 27908594 26779812 27002934
BRCA2	TALAZOPARIB	-	ClarityFoundationBiomarkers CKB CIVIC	26546619 23881923 28242752
BRCA2	QUARFLOXIN	-	CIVIC	28211448
CACNA1C	DROTAVERINE	inhibitor	DrugBank	12163106 12823389
CACNA1C	CINNARIZINE	inhibitor	DrugBank	1281221 3530295
CACNA1C	ISRADIPINE	blocker inhibitor	TdgClinicalTrial ChembIInteractions TEND	12135765 10766758 9607315
CACNA1C	CELECOXIB	-	PharmGKB	-
CACNA1C	MIBEFRADIL	inhibitor channel blocker	GuideToPharmacologyInteractions DrugBank	10665814 10372226 16306443 16899990
CACNA1C	GABAPENTIN	modulator	ChembIInteractions	-
CACNA1C	CLEVIDIPINE	blocker	TdgClinicalTrial ChembIInteractions DrugBank	15492770
CACNA1C	GABAPENTIN ENACARBIL	modulator	ChembIInteractions	-
CACNA1C	DILTIAZEM HYDROCHLORIDE	blocker	ChembIInteractions	-
CACNA1C	NICARDIPINE	-	TdgClinicalTrial TEND	-
CACNA1C	AMLODIPINE MALEATE	blocker	ChembIInteractions	-
CACNA1C	IBUTILDE	-	TdgClinicalTrial TEND	-
CACNA1C	DILTIAZEM	channel blocker	GuideToPharmacologyInteractions	-
CACNA1C	NITRENDIPINE	inhibitor	DrugBank	11752352
CACNA1C	ATAGABALIN	modulator	ChembIInteractions	-
CACNA1C	ELPETRIGINE	blocker	ChembIInteractions	-
CACNA1C	AZD1305	blocker	ChembIInteractions	-
CACNA1C	CHEMBL57769	channel blocker	GuideToPharmacologyInteractions	-
CACNA1C	VERAPAMIL	channel blocker inhibitor	TdgClinicalTrial GuideToPharmacologyInteractions	15880143 19125880 9846638 15286207
CACNA1C	FELODIPINE	blocker inhibitor	TdgClinicalTrial ChembIInteractions DrugBank	10525060 17475903 11752352
CACNA1C	BEPRIDIL HYDROCHLORIDE	blocker	ChembIInteractions	-
CACNA1C	AMLODIPINE BESYLATE	blocker	ChembIInteractions	-
CACNA1C	NIFEDIPINE	blocker inhibitor	ChembIInteractions DrugBank	9846638 11752352
CACNA1C	DILTIAZEM MALATE	blocker	ChembIInteractions	-
CACNA1C	MAGNESIUM SULFATE	-	DrugBank	17139284 17016423
CACNA1C	AMLODIPINE	-	TdgClinicalTrial	-
CACNA1C	NIMODIPINE	blocker inhibitor	ChembIInteractions DrugBank	20661350 17705883 20335610 20334460 11752352 19844625 8731425
CACNA1C	NILVADIPINE	inhibitor	DrugBank	7898101 9846638
CACNA1C	IMAGABALIN	modulator	ChembIInteractions	-
CACNA1C	DRONEDARONE HYDROCHLORIDE	blocker	ChembIInteractions	-
CACNA1C	DRONEDARONE	-	DrugBank	-
CACNA1C	PREGABALIN	modulator	ChembIInteractions	-
CACNA1C	NICARDIPINE HYDROCHLORIDE	blocker	ChembIInteractions	-
CACNA1C	NISOLDIPINE	blocker gating inhibitor inhibitor	GuideToPharmacologyInteractions ChembIInteractions DrugBank	7592963 9584217 9846638 11752352
CACNA1C	VERAPAMIL HYDROCHLORIDE	blocker	ChembIInteractions	-
CACNA2D2	PREGABALIN	modulator	ChembIInteractions	-
CACNA2D2	IMAGABALIN	modulator	ChembIInteractions	-
CACNA2D2	CELECOXIB	-	PharmGKB	-
CACNA2D2	SAFINAMIDE	-	TdgClinicalTrial	-
CACNA2D2	GABAPENTIN ENACARBIL	modulator	TdgClinicalTrial ChembIInteractions DrugBank	-
CACNA2D2	ATAGABALIN	modulator	ChembIInteractions	-
CACNA2D2	FELODIPINE	inhibitor	DrugBank	18974361 1281221
CACNA2D2	MIROGABALIN BESYLATE	modulator	ChembIInteractions	-
CACNA2D2	BUDIODARONE	-	TdgClinicalTrial	-
CACNA2D2	BEPRIDIL	inhibitor	DrugBank	1281221 7565636
CACNA2D2	NITRENDIPINE	inhibitor	DrugBank	18974361
CACNA2D2	GABAPENTIN	modulator inhibitor	TdgClinicalTrial ChembIInteractions TEND	16899342 17982508 20588320 18299583
CACNA2D2	ISRADIPINE	inhibitor	DrugBank	18974361 1281221
CACNA2D2	BEPRIDIL HYDROCHLORIDE	blocker	ChembIInteractions	-
CACNG3	GABAPENTIN	modulator	ChembIInteractions	-
CACNG3	PREGABALIN	modulator	ChembIInteractions	-
CACNG3	BEPRIDIL HYDROCHLORIDE	blocker	ChembIInteractions	-
CACNG3	GABAPENTIN ENACARBIL	modulator	ChembIInteractions	-

CACNG3	ATAGABALIN	modulator	ChEMBLInteractions	-
CACNG3	IMAGABALIN	modulator	ChEMBLInteractions	-
CAMK1D	CHEMBL359482	-	DrugBank	10592235
CAMK1D	BOSUTINIB	inhibitor	GuideToPharmacologyInteractions	-
CARD9	STAUROSPORINE	-	NCI	17450144
CASK	FORMIC ACID	-	DrugBank	-
CDS8	ALBUMIN HUMAN	-	NCI	8697653
CDK6	PALBOCICLIB	Inhibitor inhibitor	TALC MyCancerGenome ClarityFoundatio	15542782
CDK6	ABEMACICLIB	inhibitor	ClarityFoundationClinicalTrial GuideToPh	-
CDK6	APREMILAST	inhibitor	TTD	-
CDK6	(7S)-HYDROXYL-STAUROSPORINE	inhibitor	ChEMBLInteractions	-
CDK6	AMINOPURVALANOL	-	DrugBank	10592235
CDK6	RGB-286638	inhibitor	GuideToPharmacologyInteractions	-
CDK6	AZD-5438	inhibitor	ChEMBLInteractions	-
CDK6	PHA-793887	inhibitor	ChEMBLInteractions	-
CDK6	AT-7519	inhibitor	GuideToPharmacologyInteractions Chemb	-
CDK6	RIBOCICLIB SUCCINATE	inhibitor	ChEMBLInteractions	-
CDK6	G1T28-1	inhibitor	ChEMBLInteractions	-
CDK6	ALVOCIDIB	inhibitor	MyCancerGenome TdgClinicalTrial Chemb	11752352
CDK6	FULVESTRANT	-	CIVIC	27252418
CDK6	Roniciclib	inhibitor	ChEMBLInteractions	-
CDK6	FISETIN	-	DrugBank	10592235
CDK6	Ribociclib	inhibitor antagonist	MyCancerGenome TdgClinicalTrial Chemb	24045179
CDK6	PENTOBARBITAL	inhibitor	GuideToPharmacologyInteractions	-
CDKN2A	ABEMACICLIB	-	ClarityFoundationBiomarkers CKB	27217383 26183925
CDKN2A	LETROZOLE	-	OncoKB CIVIC	26715889 25524798
CDKN2A	ILORESERTIB	-	CGI	-
CDKN2A	Ribociclib	-	ClarityFoundationBiomarkers	-
CDKN2A	Roniciclib	-	ClarityFoundationBiomarkers	-
CDKN2A	PALBOCICLIB	-	ClarityFoundationBiomarkers OncoKB CK	26715889 25524798 21278246 22711607 27488531 21871868 24495407 20952405 22983396 26528855 25156567 26380006 26183925 23898052
CDKN2A	PANITUMUMAB	-	CIVIC	23746666
CDKN2B	PALBOCICLIB	-	CIVIC	23898052
CDS1	PREXASERTIB	inhibitor	ChEMBLInteractions	-
CDS1	XL-844	inhibitor	ChEMBLInteractions TTD	-
CHRM3	SOLIFENACIN SUCCINATE	antagonist	ChEMBLInteractions	-
CHRM3	HEXOCYLIUM METHYLSULFATE	antagonist	ChEMBLInteractions	-
CHRM3	STRYCHNINE	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	CHEMBL130715	agonist	GuideToPharmacologyInteractions	-
CHRM3	PROPANTHELINE BROMIDE	antagonist	ChEMBLInteractions	-
CHRM3	CLOZAPINE	antagonist	DrugBank	17848919
CHRM3	CHEMBL343357	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	BRUCINE	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	DICYCLOMINE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	PROMAZINE	antagonist	TdgClinicalTrial TEND DrugBank	17139284 17016423
CHRM3	CHEMBL99521	agonist	GuideToPharmacologyInteractions	-
CHRM3	FURTRETIONIUM	agonist	GuideToPharmacologyInteractions	-
CHRM3	ARECOLINE	agonist	GuideToPharmacologyInteractions	-
CHRM3	OXYPHENCYCLIMINE HYDROCHLORIDE	antagonist	ChEMBLInteractions	-
CHRM3	REVATROPATE	antagonist	TTD	-
CHRM3	PROPANTHELINE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	CHEMBL523685	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	Afacifenacin	antagonist	ChEMBLInteractions	-
CHRM3	MIVACURIUM	antagonist	DrugBank	19020136
CHRM3	METHOCTRAMINE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	ACETYLCHOLINE	agonist	GuideToPharmacologyInteractions	-
CHRM3	VINCAMINE	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	ARIPIRAZOLE	antagonist	DrugBank	17848919
CHRM3	ERIBAXABAN	agonist	GuideToPharmacologyInteractions	-
CHRM3	IPRATROPIUM BROMIDE HYDRATE	antagonist	ChEMBLInteractions	-
CHRM3	OXYPHENONIUM BROMIDE	antagonist	ChEMBLInteractions	-
CHRM3	MILAMELINE	agonist	GuideToPharmacologyInteractions	-
CHRM3	CEVIMELINE HYDROCHLORIDE	agonist	ChEMBLInteractions	-
CHRM3	IPRATROPIUM	antagonist	GuideToPharmacologyInteractions	-
CHRM3	CHEMBL343796	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	FESOTERODINE FUMARATE	antagonist	ChEMBLInteractions	-
CHRM3	BROMPHENIRAMINE	antagonist	DrugBank	10212017
CHRM3	METHSCOPOLAMINE BROMIDE	antagonist	ChEMBLInteractions	-
CHRM3	CLUDINIUM BROMIDE	antagonist	ChEMBLInteractions	-
CHRM3	TOLTERODINE TARTRATE	antagonist	ChEMBLInteractions	-
CHRM3	COENZYME_A	antagonist	GuideToPharmacologyInteractions	-
CHRM3	MEPENZOLATE	antagonist	DrugBank	7122991 2791613 7623487
CHRM3	HIMBACINE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	CHEMBL1233686	antagonist	GuideToPharmacologyInteractions	-
CHRM3	ACLIDINIUM	antagonist	TdgClinicalTrial GuideToPharmacologyInter	-
CHRM3	ISOPROPAMIDE IODIDE	antagonist	ChEMBLInteractions	-
CHRM3	PIPECURONIUM	antagonist	DrugBank	12426786
CHRM3	DARIFENACIN	antagonist	TdgClinicalTrial GuideToPharmacologyInter	20395537 18046909 11752352 19416629
CHRM3	GLYCOPYRROLATE	antagonist	GuideToPharmacologyInteractions DrugBar	10385241
CHRM3	5-METHYLFURMETHIODIDE	agonist	GuideToPharmacologyInteractions	-
CHRM3	CHEMBL139677	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	BENZTROPINE MESYLATE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	GLYCOPYRROLATE BROMIDE	antagonist	ChEMBLInteractions	-
CHRM3	OXYBUTYNYN	antagonist	TdgClinicalTrial GuideToPharmacologyInter	-
CHRM3	PIRENZEPINE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	THIETHYLPERAZINE	-	TdgClinicalTrial TEND	-
CHRM3	ISOPROPAMIDE	antagonist	DrugBank	3580704 29133
CHRM3	OTENZEPAD	antagonist	GuideToPharmacologyInteractions	-
CHRM3	OXYPHENCYCLIMINE	antagonist	TdgClinicalTrial TEND DrugBank	1426023 17139284 17016423 3247303
CHRM3	CHEMBL580785	antagonist	GuideToPharmacologyInteractions	-
CHRM3	BETHANECHOL	agonist	GuideToPharmacologyInteractions	-
CHRM3	CHEMBL1256682	antagonist	GuideToPharmacologyInteractions	-
CHRM3	FESOTERODINE	antagonist	TdgClinicalTrial TEND DrugBank	12076307 11752352
CHRM3	DOTHIEPIN (CHEMBL1492500)	antagonist	GuideToPharmacologyInteractions	-
CHRM3	UMECLIDIUM BROMIDE	antagonist	ChEMBLInteractions	-
CHRM3	4-DAMP	antagonist	GuideToPharmacologyInteractions	-

CHRM3	PILOCARPINE	agonist	TdgClinicalTrial GuideToPharmacologyInter	18824613 19498041
CHRM3	CHEMBL1256845	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	METHACHOLINE	agonist	DrugBank	19460789 20347047 20888332 19951374
CHRM3	ASM-024	antagonist	ChemblInteractions	-
CHRM3	BENZQUINAMIDE	antagonist	TdgClinicalTrial TEND DrugBank	17139284 17016423
CHRM3	Tarafenacin	antagonist	TdgClinicalTrial ChemblInteractions	-
CHRM3	TERFENADINE	antagonist	DrugBank	10212017
CHRM3	MEPENZOLATE BROMIDE	antagonist	ChemblInteractions	-
CHRM3	METHIXENE	antagonist	TdgClinicalTrial TEND DrugBank	17139284 17016423
CHRM3	ANISOTROPINE METHYLBROMIDE	antagonist	TdgClinicalTrial ChemblInteractions TEND	4555460 17139284 17016423
CHRM3	DIPHENIDOL	antagonist	TdgClinicalTrial TEND DrugBank	10530931 1863523 12185001 17139284 17016423
CHRM3	ACLDINIUM BROMIDE	antagonist	ChemblInteractions TTD	-
CHRM3	LAS190792	antagonist	ChemblInteractions	-
CHRM3	TOLTERODINE	antagonist	TdgClinicalTrial GuideToPharmacologyInter	11193006 19168050 14769832 11752352
CHRM3	CHEMBL206331	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	PROCYCLIDINE	antagonist	DrugBank	20624420 1426023
CHRM3	CHEMBL1628667	antagonist	GuideToPharmacologyInteractions	-
CHRM3	PROPIOMAZINE	antagonist	TdgClinicalTrial TEND DrugBank	17139284 17016423
CHRM3	UMECLEIDIUM	antagonist	GuideToPharmacologyInteractions DrugBar	23435542
CHRM3	HOMATROPINE METHYLBROMIDE	-	TdgClinicalTrial TEND	-
CHRM3	SOLIFENACIN	antagonist	TdgClinicalTrial GuideToPharmacologyInter	-
CHRM3	ARECAIDINE PROPARGYL ESTER	agonist	GuideToPharmacologyInteractions	-
CHRM3	VINBURNINE	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	CHEMBL74300	agonist	GuideToPharmacologyInteractions	-
CHRM3	SCOPOLAMINE	antagonist	GuideToPharmacologyInteractions DrugBar	18045203
CHRM3	ALCURONIUM	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	ACETYLCHOLINE CHLORIDE	agonist	ChemblInteractions	-
CHRM3	DAROTROPIUM BROMIDE	antagonist	ChemblInteractions	-
CHRM3	TROPICAMIDE	antagonist	GuideToPharmacologyInteractions Chembl	17594079
CHRM3	OXOTREMORINE	agonist	GuideToPharmacologyInteractions	-
CHRM3	CYCLOPENTOLATE HYDROCHLORIDE	antagonist	ChemblInteractions	-
CHRM3	HYOSCYAMINE	antagonist	DrugBank	11495349
CHRM3	PROMETHAZINE	-	TdgClinicalTrial TEND	-
CHRM3	XANOMELINE	agonist	GuideToPharmacologyInteractions	-
CHRM3	CEVIMELINE	-	TdgClinicalTrial TEND	-
CHRM3	DICYCLOMINE HYDROCHLORIDE	antagonist	ChemblInteractions	-
CHRM3	TROSPIMUM CHLORIDE	antagonist	ChemblInteractions	-
CHRM3	LOXAPINE	binder	DrugBank	-
CHRM3	ITOPRIDE	-	DrugBank	17300287
CHRM3	SUXAMETHONIUM	antagonist	TTD	-
CHRM3	TRIDIHEXYL	antagonist	TdgClinicalTrial TEND DrugBank	17139284 17016423
CHRM3	CHLORPROTHIXENE	antagonist	DrugBank	7855217
CHRM3	AZD8683	antagonist	ChemblInteractions	-
CHRM3	BETHANECHOL CHLORIDE	agonist	ChemblInteractions	-
CHRM3	AMITRIPTYLINE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	CARBACHOL (CHEMBL14)	agonist	ChemblInteractions	-
CHRM3	DARIFENACIN HYDROBROMIDE	antagonist	ChemblInteractions	-
CHRM3	OLANZAPINE	antagonist	TdgClinicalTrial TEND DrugBank	17848919 10227113
CHRM3	PILOCARPINE HYDROCHLORIDE	agonist	ChemblInteractions	-
CHRM3	LEVOMEPROMAZINE	antagonist	TdgClinicalTrial TEND DrugBank	2870716 2899826
CHRM3	CHEMBL279453	antagonist	GuideToPharmacologyInteractions	-
CHRM3	METHACHOLINE CHLORIDE	agonist	ChemblInteractions	-
CHRM3	BATEFENTEROL	antagonist	TdgClinicalTrial ChemblInteractions	-
CHRM3	DIPHEMANIL METHYLSULFATE	antagonist	TdgClinicalTrial ChemblInteractions TEND	11752352 17139284 17016423
CHRM3	TRIPITRAMINE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	TRIDIHEXYL CHLORIDE	antagonist	ChemblInteractions	-
CHRM3	TIOTROPIUM (CHEMBL1900528)	antagonist	TdgClinicalTrial GuideToPharmacologyInter	-
CHRM3	BIPERIDEN (CHEMBL1101)	antagonist	GuideToPharmacologyInteractions	-
CHRM3	TIOTROPIUM BROMIDE	antagonist	ChemblInteractions TTD	-
CHRM3	SABCOMELINE	agonist	GuideToPharmacologyInteractions	-
CHRM3	CLIDINIUM	antagonist	GuideToPharmacologyInteractions	-
CHRM3	DOXEPIN	-	TdgClinicalTrial	-
CHRM3	QUINUCLIDINYL BENZILATE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	ATROPINE SULFATE	antagonist	ChemblInteractions	-
CHRM3	HYDROCHLORIC ACID	antagonist	GuideToPharmacologyInteractions	-
CHRM3	ATROPINE	antagonist	TdgClinicalTrial GuideToPharmacologyInter	-
CHRM3	OXYBUTYNYN CHLORIDE	antagonist	ChemblInteractions	-
CHRM3	HEXOCYLIUM	antagonist	GuideToPharmacologyInteractions	-
COL11A1	COLLAGENASE CLOSTRIDIUM HISTOLYTIC	-	ChemblInteractions	-
COL11A1	OCRIPLASMIN	-	ChemblInteractions	-
COL4A3	COLLAGENASE CLOSTRIDIUM HISTOLYTIC	-	ChemblInteractions	-
COL4A3	OCRIPLASMIN	-	ChemblInteractions	-
COL4A5	RIOCIGUAT	activator	GuideToPharmacologyInteractions	-
COL4A5	ISOSORBIDE MONONITRATE	activator	GuideToPharmacologyInteractions	-
COL4A5	ISOSORBIDE DINITRATE	activator	GuideToPharmacologyInteractions	-
COL4A5	CHEMBL1236936	activator	GuideToPharmacologyInteractions	-
COL4A5	COLLAGENASE CLOSTRIDIUM HISTOLYTIC	-	ChemblInteractions	-
COL4A5	CHEMBL598952	inhibitor	GuideToPharmacologyInteractions	-
COL4A5	ATACIGUAT	activator	GuideToPharmacologyInteractions	-
COL4A5	LATANOPROSTENE BUNOD	activator	GuideToPharmacologyInteractions	-
COL4A5	NITROGLYCERIN	activator	GuideToPharmacologyInteractions	-
COL4A5	CHEMBL353759	activator	GuideToPharmacologyInteractions	-
COL4A5	OCRIPLASMIN	-	ChemblInteractions	-
CPT1A	PERHEXILINE	inhibitor	TdgClinicalTrial TEND DrugBank	8694852 17445089 16306812 11752352 17139284 17016423 11117381
CPT1A	LEVOCARNITINE	activator	DrugBank	12705401 15647998 16362726 11752352 14711372 16283381
CPT1A	GLYBURIDE	-	DrugBank	3104327 3090894
DCP1B	GEMCITABINE	-	PharmGKB	-
DHRS4L1	CHEMBL389051	-	DrugBank	10592235
DHRS4L1	CHEMBL1161862	-	DrugBank	10592235
DHRS4L1	QUINAZOLINE-2,4,6-TRIAMINE	-	DrugBank	10592235
DHRS4L1	CHEMBL1232399	-	DrugBank	10592235
DHRS4L1	CHEMBL1232702	-	DrugBank	10592235
DOCK10	PYROXAMIDE	-	NCI	18499258
DSCAM	CARBOPLATIN	-	PharmGKB	-
DSCAM	PACUTAXEL	-	PharmGKB	-
DTNBP1	CLOZAPINE	-	PharmGKB	-
DTNBP1	METHAMPHETAMINE	-	PharmGKB	-
EPHA7	CHEMBL552425	-	DrugBank	10592235
EPHA7	VANDETANIB	inhibitor	ChemblInteractions	-
ESRRG	CHEMBL194805	-	DrugBank	10592235

CHRM3	PILOCARPINE	agonist	TdgClinicalTrial GuideToPharmacologyInter	18824613 19498041
CHRM3	CHEMBL1256845	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	METHACHOLINE	agonist	DrugBank	19460789 20347047 20888332 19951374
CHRM3	ASM-024	antagonist	ChembInteractions	-
CHRM3	BENZQUINAMIDE	antagonist	TdgClinicalTrial TEND DrugBank	17139284 17016423
CHRM3	Tarafenacin	antagonist	TdgClinicalTrial ChembInteractions	-
CHRM3	TERFENADINE	antagonist	DrugBank	10212017
CHRM3	MEPENZOLATE BROMIDE	antagonist	ChembInteractions	-
CHRM3	METHIXENE	antagonist	TdgClinicalTrial TEND DrugBank	17139284 17016423
CHRM3	ANISOTROPINE METHYLBROMIDE	antagonist	TdgClinicalTrial ChembInteractions TEND	4555460 17139284 17016423
CHRM3	DIPHENIDOL	antagonist	TdgClinicalTrial TEND DrugBank	10530931 1863523 12185001 17139284 17016423
CHRM3	ACLDINIUM BROMIDE	antagonist	ChembInteractions TTD	-
CHRM3	LAS190792	antagonist	ChembInteractions	-
CHRM3	TOLTERODINE	antagonist	TdgClinicalTrial GuideToPharmacologyInter	11193006 19168050 14769832 11752352
CHRM3	CHEMBL206331	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	PROCYCLIDINE	antagonist	DrugBank	20624420 1426023
CHRM3	CHEMBL1628667	antagonist	GuideToPharmacologyInteractions	-
CHRM3	PROPIOMAZINE	antagonist	TdgClinicalTrial TEND DrugBank	17139284 17016423
CHRM3	UMECLEIDIUM	antagonist	GuideToPharmacologyInteractions DrugBar	23435542
CHRM3	HOMATROPINE METHYLBROMIDE	-	TdgClinicalTrial TEND	-
CHRM3	SOLIFENACIN	antagonist	TdgClinicalTrial GuideToPharmacologyInter	-
CHRM3	ARECAIDINE PROPARGYL ESTER	agonist	GuideToPharmacologyInteractions	-
CHRM3	VINBURNINE	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	CHEMBL74300	agonist	GuideToPharmacologyInteractions	-
CHRM3	SCOPOLAMINE	antagonist	GuideToPharmacologyInteractions DrugBar	18045203
CHRM3	ALCUONIUM	allosteric modulator	GuideToPharmacologyInteractions	-
CHRM3	ACETYLCHOLINE CHLORIDE	agonist	ChembInteractions	-
CHRM3	DAROTROPIUM BROMIDE	antagonist	ChembInteractions	-
CHRM3	TROPICAMIDE	antagonist	GuideToPharmacologyInteractions Chemb	17594079
CHRM3	OXOTREMORINE	agonist	GuideToPharmacologyInteractions	-
CHRM3	CYCLOPENTOLATE HYDROCHLORIDE	antagonist	ChembInteractions	-
CHRM3	HYOSCYAMINE	antagonist	DrugBank	11495349
CHRM3	PROMETHAZINE	-	TdgClinicalTrial TEND	-
CHRM3	XANOMELINE	agonist	GuideToPharmacologyInteractions	-
CHRM3	CEVIMELINE	-	TdgClinicalTrial TEND	-
CHRM3	DICYCLOMINE HYDROCHLORIDE	antagonist	ChembInteractions	-
CHRM3	TROSPIMUM CHLORIDE	antagonist	ChembInteractions	-
CHRM3	LOXAPINE	binder	DrugBank	-
CHRM3	ITOPRIDE	-	DrugBank	17300287
CHRM3	SUXAMETHONIUM	antagonist	TTD	-
CHRM3	TRIDIHEXYL	antagonist	TdgClinicalTrial TEND DrugBank	17139284 17016423
CHRM3	CHLORPROTHIXENE	antagonist	DrugBank	7855217
CHRM3	AZD8683	antagonist	ChembInteractions	-
CHRM3	BETHANECHOL CHLORIDE	agonist	ChembInteractions	-
CHRM3	AMITRIPTYLINE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	CARBACHOL (CHEMBL14)	agonist	ChembInteractions	-
CHRM3	DARIFENACIN HYDROBROMIDE	antagonist	ChembInteractions	-
CHRM3	OLANZAPINE	antagonist	TdgClinicalTrial TEND DrugBank	17848919 10227113
CHRM3	PILOCARPINE HYDROCHLORIDE	agonist	ChembInteractions	-
CHRM3	LEVOMEPROMAZINE	antagonist	TdgClinicalTrial TEND DrugBank	2870716 2899826
CHRM3	CHEMBL279453	antagonist	GuideToPharmacologyInteractions	-
CHRM3	METHACHOLINE CHLORIDE	agonist	ChembInteractions	-
CHRM3	BATEFENTEROL	antagonist	TdgClinicalTrial ChembInteractions	-
CHRM3	DIPHEMANIL METHYLSULFATE	antagonist	TdgClinicalTrial ChembInteractions TEND	11752352 17139284 17016423
CHRM3	TRIPITRAMINE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	TRIDIHEXYL CHLORIDE	antagonist	ChembInteractions	-
CHRM3	TIOTROPIUM (CHEMBL1900528)	antagonist	TdgClinicalTrial GuideToPharmacologyInter	-
CHRM3	BIPERIDEN (CHEMBL1101)	antagonist	GuideToPharmacologyInteractions	-
CHRM3	TIOTROPIUM BROMIDE	antagonist	ChembInteractions TTD	-
CHRM3	SABCOMELINE	agonist	GuideToPharmacologyInteractions	-
CHRM3	CLIDINIUM	antagonist	GuideToPharmacologyInteractions	-
CHRM3	DOXEPIN	-	TdgClinicalTrial	-
CHRM3	QUINUCLIDINYL BENZILATE	antagonist	GuideToPharmacologyInteractions	-
CHRM3	ATROPINE SULFATE	antagonist	ChembInteractions	-
CHRM3	HYDROCHLORIC ACID	antagonist	GuideToPharmacologyInteractions	-
CHRM3	ATROPINE	antagonist	TdgClinicalTrial GuideToPharmacologyInter	-
CHRM3	OXYBUTYNYN CHLORIDE	antagonist	ChembInteractions	-
CHRM3	HEXOCYLIUM	antagonist	GuideToPharmacologyInteractions	-
COL11A1	COLLAGENASE CLOSTRIDIUM HISTOLYTIC	-	ChembInteractions	-
COL11A1	OCRIPLASMINE	-	ChembInteractions	-
COL4A3	COLLAGENASE CLOSTRIDIUM HISTOLYTIC	-	ChembInteractions	-
COL4A3	OCRIPLASMINE	-	ChembInteractions	-
COL4A5	RIOCIGUAT	activator	GuideToPharmacologyInteractions	-
COL4A5	ISOSORBIDE MONONITRATE	activator	GuideToPharmacologyInteractions	-
COL4A5	ISOSORBIDE DINITRATE	activator	GuideToPharmacologyInteractions	-
COL4A5	CHEMBL1236936	activator	GuideToPharmacologyInteractions	-
COL4A5	COLLAGENASE CLOSTRIDIUM HISTOLYTIC	-	ChembInteractions	-
COL4A5	CHEMBL598952	inhibitor	GuideToPharmacologyInteractions	-
COL4A5	ATACIGUAT	activator	GuideToPharmacologyInteractions	-
COL4A5	LATANOPROSTENE BUNOD	activator	GuideToPharmacologyInteractions	-
COL4A5	NITROGLYCERIN	activator	GuideToPharmacologyInteractions	-
COL4A5	CHEMBL353759	activator	GuideToPharmacologyInteractions	-
COL4A5	OCRIPLASMINE	-	ChembInteractions	-
CPT1A	PERHEXILINE	inhibitor	TdgClinicalTrial TEND DrugBank	8694852 17445089 16306812 11752352 17139284 17016423 11117381
CPT1A	LEVOCARNITINE	activator	DrugBank	12705401 15647998 16362726 11752352 14711372 16283381
CPT1A	GLYBURIDE	-	DrugBank	3104327 3090894
DCP1B	GEMCITABINE	-	PharmGKB	-
DHRS4L1	CHEMBL389051	-	DrugBank	10592235
DHRS4L1	CHEMBL1161862	-	DrugBank	10592235
DHRS4L1	QUINAZOLINE-2,4,6-TRIAMINE	-	DrugBank	10592235
DHRS4L1	CHEMBL1232399	-	DrugBank	10592235
DHRS4L1	CHEMBL1232702	-	DrugBank	10592235
DOCK10	PYROXAMIDE	-	NCI	18499258
DSCAM	CARBOPLATIN	-	PharmGKB	-
DSCAM	PACLITAXEL	-	PharmGKB	-

DTNBP1	CLOZAPINE	-	PharmGKB	-
DTNBP1	METHAMPHETAMINE	-	PharmGKB	-
EPHA7	CHEMBL552425	-	DrugBank	10592235
EPHA7	VANDETANIB	inhibitor	ChEMBLInteractions	-
ESRRG	CHEMBL194805	-	DrugBank	10592235
ESRRG	BISPHENOL A	-	DrugBank	10592235
ESRRG	TROGLITAZONE	inverse agonist	DrugBank	20298676
ESRRG	DIETHYLSTILBESTROL	agonist	NCI DrugBank	12579585 15161930 10592235
ESRRG	CHOLIC ACID	-	DrugBank	10592235
ESRRG	CHEMBL1231453	-	DrugBank	10592235
ESRRG	AFIMOXIFENE (CHEMBL10041)	antagonist	ChEMBLInteractions	-
FARS2	L-PHENYLANILINE	-	DrugBank	16969782 16338408 17139284 17016423
FIP1L1	IMATINIB	-	FDA	-
FTL	IRON DEXTRAN	other	DrugBank	17139284 17016423
FTL	PROTOPORPHYRIN IX	-	DrugBank	10592235 17139284 17016423
GABRB1	FLURAZEPAM HYDROCHLORIDE	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	TOPIRAMATE	-	ChEMBLInteractions	-
GABRB1	CHLORDIAZEPOXIDE HYDROCHLORIDE	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	METHOXYFLURANE	-	ChEMBLInteractions	-
GABRB1	CHLORDIAZEPOXIDE	positive allosteric modulator	TdgClinicalTrial ChEMBLInteractions TEND	-
GABRB1	ETAZOLATE	-	TdgClinicalTrial	-
GABRB1	ENFLURANE	-	ChEMBLInteractions	-
GABRB1	FLURAZEPAM	-	TdgClinicalTrial TEND	-
GABRB1	PROPOFOL	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	MEPROBAMATE	agonist	ChEMBLInteractions	-
GABRB1	CLORAZEPIC ACID	-	TdgClinicalTrial TEND	-
GABRB1	ETOMIDATE	-	ChEMBLInteractions	-
GABRB1	METHYPRYLON	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	FLUMAZENIL	-	ChEMBLInteractions	-
GABRB1	PRIMIDONE	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	PF-06372865	agonist	ChEMBLInteractions	-
GABRB1	DESFLURANE	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	CLOTIAZEPAM	potentiator	TdgClinicalTrial TEND DrugBank	18855614
GABRB1	LORAZEPAM	positive allosteric modulator	TdgClinicalTrial ChEMBLInteractions TEND	-
GABRB1	BUTALBITAL	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	HALOTHANE	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	SEVOFLURANE	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	CLOBAZAM	positive allosteric modulator	TdgClinicalTrial ChEMBLInteractions TEND	-
GABRB1	MIDAZOLAM	-	TdgClinicalTrial TEND	-
GABRB1	METHOHEXITAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	THIAMYLAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	CINOLAZEPAM	potentiator	TdgClinicalTrial TEND DrugBank	7849137
GABRB1	ESTAZOLAM	positive allosteric modulator potentiator	TdgClinicalTrial ChEMBLInteractions TEND	639854 2889803
GABRB1	BROMAZEPAM	potentiator	TdgClinicalTrial TEND DrugBank	18384456
GABRB1	ADIPILON	-	TdgClinicalTrial	-
GABRB1	OCINAPLON	-	TdgClinicalTrial	-
GABRB1	OXAZEPAM	positive allosteric modulator potentiator	TdgClinicalTrial ChEMBLInteractions TEND	18384456 11752090
GABRB1	ETHCHLORVYNOL	-	ChEMBLInteractions	-
GABRB1	CLORAZEPATE DIPOASSIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	TALBUTAL	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	ALPRAZOLAM	positive allosteric modulator	TdgClinicalTrial ChEMBLInteractions TEND	-
GABRB1	FLUDIAZEPAM	potentiator	TdgClinicalTrial TEND DrugBank	2857046
GABRB1	T-BUTYLBI-CYCLOPHOSPHOROTHIONATE	channel blocker	GuideToPharmacologyInteractions	-
GABRB1	ISOFLURANE	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	TEMAZEPAM	positive allosteric modulator potentiator	TdgClinicalTrial ChEMBLInteractions TEND	18384456 20138190
GABRB1	ADINAZOLAM	potentiator	TdgClinicalTrial TEND DrugBank	6148400 6320036
GABRB1	METHARBITAL	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	SECOBARBITAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	LINDANE	antagonist	DrugBank	12614680 7885191 12645305 7566682 20600211 10592235 17139284 14635176 17016423 9530529 8841090
GABRB1	PENTOBARBITAL	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	QUAZEPAM	positive allosteric modulator potentiator	TdgClinicalTrial ChEMBLInteractions TEND	3017690 2892106
GABRB1	GLUTETHIMIDE	-	ChEMBLInteractions	-
GABRB1	NITRAZEPAM	potentiator	TdgClinicalTrial TEND DrugBank	18384456 11752090
GABRB1	TRIAZOLAM	positive allosteric modulator potentiator	TdgClinicalTrial ChEMBLInteractions TEND	18384456 11752090
GABRB1	ZALEPLON	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	PENTOBARBITAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	TRICLOFOS SODIUM	-	ChEMBLInteractions	-
GABRB1	PRAZEPAM	positive allosteric modulator potentiator	TdgClinicalTrial ChEMBLInteractions TEND	7773620
GABRB1	CLONAZEPAM	positive allosteric modulator	TdgClinicalTrial ChEMBLInteractions TEND	-
GABRB1	HALAZEPAM	positive allosteric modulator potentiator	TdgClinicalTrial ChEMBLInteractions TEND	6738302 2867566
GABRB1	ESOPICLONE	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	BUTABARBITAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	ZOLPIDEM TARTRATE	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	PICROTOXIN	channel blocker	GuideToPharmacologyInteractions	-
GABRB1	GABOXADOL	agonist	TdgClinicalTrial ChEMBLInteractions	-
GABRB1	KETAZOLAM	potentiator	DrugBank	18384456 11752090 15009644 2874815
GABRB1	MIDAZOLAM HYDROCHLORIDE	positive allosteric modulator	ChEMBLInteractions	-
GABRB1	ACAMPROSATE CALCIUM	-	ChEMBLInteractions	-
GABRB1	DIAZEPAM	positive allosteric modulator potentiator	TdgClinicalTrial ChEMBLInteractions TEND	18384456 11752090
GABRB1	THIOPENTAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GC	ASPIRIN	-	NCI	17555340
GC	AFEGOSTAT TARTRATE	-	ChEMBLInteractions	-
GC	ANISINDIONE	inhibitor	ChEMBLInteractions	-
GHR	IBUTAMOREN	binder	TTD	-
GHR	PEGVISOMANT	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	19820031 17322491 11752352 20595800
GHR	SOMATROPIN	binder agonist	TdgClinicalTrial ChEMBLInteractions TEND	17133434 17082603 17128263 16917171 11752352 16965663
GHR	CHEMBL324218	agonist	TTD	-
GHR	SOMATREM	agonist	ChEMBLInteractions	-
GHR	CHEMBL18872	agonist	TTD	-
GLRB	ISOFLURANE	-	ChEMBLInteractions	-
GLRB	CHEMBL1179605	antagonist	GuideToPharmacologyInteractions	-
GLRB	PICROTIN	channel blocker	GuideToPharmacologyInteractions	-
GLRB	GLYCINE	-	DrugBank	16884688
GLRB	BILOBALIDE	antagonist	GuideToPharmacologyInteractions	-
GLRB	ZINC ION	allosteric modulator	GuideToPharmacologyInteractions	-

GLRB	DESFLURANE	-	ChembIInteractions	-
GLRB	HALOTHANE	-	ChembIInteractions	-
GLRB	MINOXIDIL	antagonist	GuideToPharmacologyInteractions	-
GLRB	NIFEDIPINE	antagonist	GuideToPharmacologyInteractions	-
GLRB	LINDANE	antagonist	DrugBank	12614680 20600211
GLRB	ENFLURANE	-	ChembIInteractions	-
GLRB	GW468816	antagonist	TTD	-
GLRB	METHOXYFLURANE	agonist	ChembIInteractions	-
GLRB	PICROTOXININ	channel blocker	GuideToPharmacologyInteractions	-
GLRB	PANITUMUMAB	antagonist	TTD	-
GLRB	PICROTOXIN	channel blocker	GuideToPharmacologyInteractions	-
GLRB	SEVOFLURANE	-	ChembIInteractions	-
GLRB	TROPISETRON	antagonist	GuideToPharmacologyInteractions	-
GLS	METHOTREXATE	-	NCI	15511236
GLS	GLUTAMINE	-	NCI	9124626 6146632 9392478 11533299 1174515 14722097
GLS	6-DIAZO-5-OXO-L-NORLEUCINE	-	NCI	7867599
GLS	L-GLUTAMATE	-	DrugBank	16824605 16720907 16952838 16861819 16815871
GLS	DEXAMETHASONE	-	NCI	7904483
GMD5	CHEMBL384759	-	DrugBank	10592235
GMD5	CHEMBL1233001	-	DrugBank	10592235 17139284 17016423
GRB2	DACTINOMYCIN	-	NCI	15964235
GRB2	CHEMBL291678	-	DrugBank	10592235 17139284 17016423
GRB2	PEGADEEMASE BOVINE	binder	DrugBank	9299436
GRIK2	KAINIC ACID	agonist	GuideToPharmacologyInteractions	-
GRIK2	APROBARBITAL	antagonist	DrugBank	11264449 10487207
GRIK2	TALBUTAL	antagonist	TdgClinicalTrial TEND DrugBank	11264449 10487207
GRIK2	DOMOIC ACID	agonist	GuideToPharmacologyInteractions DrugBank	10592235 17139284 17016423
GRIK2	MEPHOBARBITAL	antagonist	DrugBank	11264449 10487207
GRIK2	METHARBITAL	antagonist	TdgClinicalTrial TEND DrugBank	11264449 10487207
GRIK2	PHENOBARBITAL	antagonist	TdgClinicalTrial TEND DrugBank	11264449 10487207
GRIK2	METHYPRYLON	allosteric modulator	GuideToPharmacologyInteractions	-
GRIK2	BUTALBITAL	antagonist	TdgClinicalTrial TEND DrugBank	11264449 10487207
GRIK2	BUTETHAL	antagonist	TdgClinicalTrial TEND DrugBank	11264449 10487207
GRIK2	BARBITAL	antagonist	DrugBank	11264449 10487207
GRIK2	THIOPENTAL	antagonist	TdgClinicalTrial TEND DrugBank	11264449 10487207
GRIK2	2S,4R-4-METHYLGLUTAMATE	agonist	GuideToPharmacologyInteractions DrugBank	10592235 17139284 17016423
GRIK2	Selurampanel	antagonist	ChembIInteractions	-
GRIK2	HEPTABARBITAL	antagonist	DrugBank	11264449 10487207
GRIK2	L-GLUTAMATE	-	DrugBank	17581967
GRIK2	TOPIRAMATE	antagonist	ChembIInteractions	-
GRIK2	SECOBARBITAL	antagonist	TdgClinicalTrial TEND DrugBank	11264449 10487207
GRIK2	TEZAMPANEL	antagonist	TdgClinicalTrial ChembIInteractions	-
GRIK2	QUISQLALATE	-	DrugBank	10592235 17139284 17016423
GRIK2	AMOBARBITAL	antagonist	DrugBank	11264449 10487207
GRIK2	CHEMBL301536	agonist	GuideToPharmacologyInteractions	-
GRIK2	PRIMIDONE	antagonist	TdgClinicalTrial TEND DrugBank	11264449 10487207
GRIK2	PENTOBARBITAL	-	TdgClinicalTrial TEND	-
GRIK2	BUTABARBITAL	antagonist	TdgClinicalTrial TEND DrugBank	11264449 10487207
GRIK2	MESALAMINE	agonist	GuideToPharmacologyInteractions	-
GRIK2	HEXOBARBITAL	antagonist	TdgClinicalTrial TEND DrugBank	11264449 10487207
GRIN2A	LANICEMINE	blocker	ChembIInteractions	-
GRIN2A	CHEMBL140784	agonist	GuideToPharmacologyInteractions	-
GRIN2A	KETAMINE HYDROCHLORIDE	-	ChembIInteractions	-
GRIN2A	CHEMBL280828	agonist	GuideToPharmacologyInteractions	-
GRIN2A	GLYCINE	agonist antagonist	GuideToPharmacologyInteractions DrugBank	17360906 17405869 17646495 17513636 11752352 17403555
GRIN2A	NEBOGLAMINE	positive allosteric modulator	ChembIInteractions	-
GRIN2A	ACETYLCYSTEINE	activator	DrugBank	12183209
GRIN2A	MAGNESIUM	channel blocker	GuideToPharmacologyInteractions	-
GRIN2A	ORPHENADRINE CITRATE	antagonist	ChembIInteractions	-
GRIN2A	N-METHYL-D-ASPARTIC ACID (NMDA)	agonist	GuideToPharmacologyInteractions	-
GRIN2A	AZD8108	antagonist	ChembIInteractions	-
GRIN2A	HALOTHANE	antagonist	DrugBank	8968191
GRIN2A	NRX-1074	partial agonist	ChembIInteractions	-
GRIN2A	RAPASTINEL	partial agonist	ChembIInteractions	-
GRIN2A	CHEMBL31741	antagonist	GuideToPharmacologyInteractions	-
GRIN2A	CHEMBL1184349	channel blocker	GuideToPharmacologyInteractions	-
GRIN2A	GW468816	antagonist	ChembIInteractions	-
GRIN2A	AMANTADINE HYDROCHLORIDE	antagonist channel blocker	GuideToPharmacologyInteractions ChembI	-
GRIN2A	RALFINAMIDE	antagonist	ChembIInteractions	-
GRIN2A	DEXTROMETHORPHAN HYDROBROMIDE	antagonist	ChembIInteractions	-
GRIN2A	PHENCYCLIDINE	channel blocker	GuideToPharmacologyInteractions	-
GRIN2A	ORPHENADRINE (CHLORIDE)	antagonist	ChembIInteractions	-
GRIN2A	MEMANTINE	-	TEND	-
GRIN2A	ASPARTIC ACID	agonist	GuideToPharmacologyInteractions	-
GRIN2A	MEMANTINE HYDROCHLORIDE	-	ChembIInteractions	-
GRIN2A	MODAFINIL	antagonist	GuideToPharmacologyInteractions	-
GRIN2A	L-GLUTAMATE	-	DrugBank	8886398 12068077 17139284 17016423 11080203
GRIN2A	CGP-37849	antagonist	GuideToPharmacologyInteractions	-
GRIN2A	KETAMINE	channel blocker	GuideToPharmacologyInteractions	-
GRIN2A	TENOCCYCLIDINE	antagonist	DrugBank	17157509 2538766
GRIN2A	DEXTROMETHORPHAN POLISTIREX	antagonist	ChembIInteractions	-
GRIN2A	CNS-5161	blocker	ChembIInteractions	-
GRIN2A	NERAMEXANE MESYLATE	antagonist	ChembIInteractions	-
GRIN2A	CHEMBL191838	antagonist	GuideToPharmacologyInteractions	-
GRIN2A	FELBAMATE	antagonist	ChembIInteractions TEND DrugBank	11752352
GRIN2A	CHEMBL50267	antagonist	GuideToPharmacologyInteractions	-
GRIN2A	ESKETAMINE	-	ChembIInteractions	-
GRIN2A	SELFOTEL	antagonist	GuideToPharmacologyInteractions	-
GRIN2A	DIZOCLIPINE	channel blocker	GuideToPharmacologyInteractions	-
GRIN2A	ESKETAMINE HYDROCHLORIDE	-	ChembIInteractions	-
GRIN2A	CHEMBL233945	allosteric modulator	GuideToPharmacologyInteractions	-
GRIN2A	CHEMBL273636	antagonist	GuideToPharmacologyInteractions	-
GRIN2A	DELUCEMINE	antagonist	ChembIInteractions	-
GRIN2A	D-ASPARTATE	agonist	GuideToPharmacologyInteractions	-
GRIN2A	CHEMBL22304	antagonist	GuideToPharmacologyInteractions	-

GRIN2A	CHEMBL287327	antagonist	GuideToPharmacologyInteractions	-
GRIN2A	AV-101	antagonist	ChemblInteractions	-
GRIN2A	CHEMBL173031	antagonist	GuideToPharmacologyInteractions	-
GRIN2A	(D)-SERINE	agonist	GuideToPharmacologyInteractions	-
GRIN2A	MESORIDAZINE	antagonist	GuideToPharmacologyInteractions	-
GRIN2A	CONANTOKIN G	antagonist	GuideToPharmacologyInteractions	-
GRIN2A	Indantadol	antagonist	ChemblInteractions	-
GRIN2A	ACAMPROSATE CALCIUM	antagonist	ChemblInteractions	-
GRM8	CHEMBL277475	agonist	GuideToPharmacologyInteractions	-
GRM8	TRIAMCINOLONE DIACETATE	allosteric modulator	GuideToPharmacologyInteractions	-
GRM8	CHEMBL284193	antagonist	GuideToPharmacologyInteractions	-
GRM8	CHEMBL34453	agonist	GuideToPharmacologyInteractions	-
GRM8	CHEMBL33567	agonist	GuideToPharmacologyInteractions	-
GRM8	CHEMBL143210	agonist	GuideToPharmacologyInteractions	-
GRM8	CHEMBL1319383	agonist	GuideToPharmacologyInteractions	-
GRM8	L-GLUTAMATE	-	DrugBank	17360958 1695773
GRM8	DEXFOSFOSERINE	agonist	GuideToPharmacologyInteractions	-
GRM8	EGLUMEGAD	agonist	GuideToPharmacologyInteractions	-
GRM8	CHEMBL86508	antagonist	GuideToPharmacologyInteractions	-
GRM8	CHEMBL432038	antagonist	GuideToPharmacologyInteractions	-
HIBCH	QUERCETIN	-	DrugBank	10592235
HPSE	THROMBIN	-	NCI	1612123
HPSE	HEPARIN	-	TdgClinicalTrial	-
HPSE	MUPARFOSTAT (CHEMBL1615835)	inhibitor	ChemblInteractions	-
HTR2C	LOXAPINE	antagonist	GuideToPharmacologyInteractions Chembl	10991983
HTR2C	VABICASERIN HYDROCHLORIDE	agonist	ChemblInteractions	-
HTR2C	CHEMBL297784	antagonist	GuideToPharmacologyInteractions	-
HTR2C	QUIPAZINE	agonist	GuideToPharmacologyInteractions	-
HTR2C	APOMORPHINE	antagonist agonist	GuideToPharmacologyInteractions DrugBank	18691132
HTR2C	RITANSERIN	antagonist	GuideToPharmacologyInteractions	-
HTR2C	[3H]LSD	agonist	GuideToPharmacologyInteractions	-
HTR2C	DERAMCICLANE	inverse agonist	DrugBank	9551765
HTR2C	MIRTAZAPINE	antagonist	GuideToPharmacologyInteractions Chembl	16433010 11271412 10762339 9832994 11752352 14615872
HTR2C	THIORIDAZINE HYDROCHLORIDE	antagonist	ChemblInteractions	-
HTR2C	MESORIDAZINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	CHEMBL1628670	agonist	GuideToPharmacologyInteractions	-
HTR2C	AMOXAPINE	antagonist	DrugBank	10821800
HTR2C	TRAMADOL	-	TdgClinicalTrial TEND	-
HTR2C	DAPOXETINE	-	DrugBank	17624269
HTR2C	METHYLENEDI-OXYMETHAMPHETAMINE	agonist	DrugBank	2871581 7824160
HTR2C	SPIRAMIDE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	CHEMBL14276	antagonist	GuideToPharmacologyInteractions	-
HTR2C	VORTIOXETINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	METHYSERGIDE	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	12555241 11752352
HTR2C	METHYSERGIDE MALEATE	antagonist	ChemblInteractions	-
HTR2C	CHEMBL316069	antagonist	GuideToPharmacologyInteractions	-
HTR2C	ZIPRASIDONE MESYLATE	antagonist	ChemblInteractions	-
HTR2C	AMISULPRIDE	-	PharmGKB	-
HTR2C	DOXEPIN	-	TdgClinicalTrial	-
HTR2C	ROXINDOLE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	GLEMANSERIN	antagonist	GuideToPharmacologyInteractions	-
HTR2C	LEVOMEPROMAZINE	antagonist	DrugBank	15701205
HTR2C	TERGURIDE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	METERGOLINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	5-MEO-DMT	agonist	GuideToPharmacologyInteractions	-
HTR2C	8-OH-DPAT	agonist	GuideToPharmacologyInteractions	-
HTR2C	ZOTEPINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	ROPINIROLE	agonist	DrugBank	18691132
HTR2C	CHLORPROMAZINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	CHEMBL1600780	agonist	GuideToPharmacologyInteractions	-
HTR2C	TRAZODONE HYDROCHLORIDE	antagonist	ChemblInteractions	-
HTR2C	TRIFLUOPERAZINE HYDROCHLORIDE	antagonist	ChemblInteractions	-
HTR2C	METHYLERGONOVINE	agonist	GuideToPharmacologyInteractions	-
HTR2C	EPLIVANSERIN FUMARATE	binder	TTD	-
HTR2C	QUETIAPINE FUMARATE	antagonist	ChemblInteractions	-
HTR2C	NEFAZODONE	antagonist	TTD	-
HTR2C	CHEMBL20963	agonist	GuideToPharmacologyInteractions	-
HTR2C	MESULERGINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	LISURIDE	agonist	GuideToPharmacologyInteractions DrugBank	18691132 9600588
HTR2C	CAPTODIAME	antagonist	DrugBank	23863923
HTR2C	CHEMBL133455	agonist	GuideToPharmacologyInteractions	-
HTR2C	CHEMBL407909	agonist	GuideToPharmacologyInteractions	-
HTR2C	CHEMBL473186	antagonist	GuideToPharmacologyInteractions	-
HTR2C	TIOSPIRONE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	ZIPRASIDONE	antagonist	GuideToPharmacologyInteractions TEND	-
HTR2C	SB-224289	antagonist	GuideToPharmacologyInteractions	-
HTR2C	CHLORPROTHIXENE	antagonist	TdgClinicalTrial ChemblInteractions TEND	17139284 17016423
HTR2C	XANOMELINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	LOXAPINE SUCCINATE	antagonist	ChemblInteractions	-
HTR2C	MK-212	agonist	GuideToPharmacologyInteractions	-
HTR2C	THIORIDAZINE	antagonist	GuideToPharmacologyInteractions Chembl	-
HTR2C	PERPHENAZINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	PALIPERIDONE	antagonist	DrugBank	11132243
HTR2C	TRIMIPRAMINE MALEATE	antagonist	ChemblInteractions	-
HTR2C	CHEMBL186179	agonist	GuideToPharmacologyInteractions	-
HTR2C	CLOZAPINE	antagonist	PharmGKB TdgClinicalTrial GuideToPharmacologyInteractions	16182256 15917433
HTR2C	SEROTONIN	agonist	GuideToPharmacologyInteractions	-
HTR2C	5-METHOXYTRYPTAMINE	agonist	GuideToPharmacologyInteractions	-
HTR2C	CARPHENAZINE MALEATE	antagonist	ChemblInteractions	-
HTR2C	ZIPRASIDONE HYDROCHLORIDE	antagonist	ChemblInteractions	-
HTR2C	SB-242084	antagonist	GuideToPharmacologyInteractions	-
HTR2C	QUINPIROLE	agonist	GuideToPharmacologyInteractions	-
HTR2C	CHEMBL309760	agonist	GuideToPharmacologyInteractions	-
HTR2C	BIFEPRUNOX	-	TdgClinicalTrial	-
HTR2C	METITEPINE	antagonist	GuideToPharmacologyInteractions	-

HTR2C	CHEMBL506999	agonist	GuideToPharmacologyInteractions	-
HTR2C	CABERGOLINE	agonist	GuideToPharmacologyInteractions DrugBank	18691132 18992242 20426763 10641988
HTR2C	SPIPERONE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	LOXAPINE HYDROCHLORIDE	antagonist	ChEMBLInteractions	-
HTR2C	SERTINDOLE	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	16925508 11594443
HTR2C	GR-127935	agonist	GuideToPharmacologyInteractions	-
HTR2C	CHEMBL65280	antagonist	GuideToPharmacologyInteractions	-
HTR2C	BRL-15,572	agonist	GuideToPharmacologyInteractions	-
HTR2C	KETANSERIN	antagonist	GuideToPharmacologyInteractions	-
HTR2C	DEXFENFLURAMINE	agonist	DrugBank	11888565 11198050 12678838 11489456 10353435
HTR2C	LORCASERIN	agonist	TdgClinicalTrial GuideToPharmacologyInteractions	16259227 16625817
HTR2C	ASENAPINE (CHEMBL3187365)	-	TdgClinicalTrial	-
HTR2C	IDALOPIRDINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	ERGOTAMINE	agonist	GuideToPharmacologyInteractions DrugBank	12525272
HTR2C	RISPERIDONE	antagonist	PharmGKB GuideToPharmacologyInteractions	7898773 11132243
HTR2C	PERGOLIDE	agonist	GuideToPharmacologyInteractions	-
HTR2C	ESMIRTAZAPINE MALEATE	antagonist	ChEMBLInteractions	-
HTR2C	FENFLURAMINE	agonist	DrugBank	16973729 15869562 10617681 12708517 16249524
HTR2C	CYCLOBENZAPRINE HYDROCHLORIDE	antagonist	ChEMBLInteractions	-
HTR2C	OLANZAPINE	antagonist	PharmGKB TdgClinicalTrial GuideToPharmacologyInteractions	16983399 16336943 16918396 11752352 16952163 10227113 117624999
HTR2C	TRAZODONE	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	-
HTR2C	CHEMBL609728	-	DrugBank	-
HTR2C	BROLAMFETAMINE	agonist	GuideToPharmacologyInteractions	-
HTR2C	SARPOGRELATE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	LORCASERIN HYDROCHLORIDE	agonist	ChEMBLInteractions	-
HTR2C	RS-102,221	antagonist	GuideToPharmacologyInteractions	-
HTR2C	RU-24969	agonist	GuideToPharmacologyInteractions	-
HTR2C	YOHIMBINE	antagonist	DrugBank	8032658 6136920
HTR2C	NEFAZODONE HYDROCHLORIDE	antagonist	ChEMBLInteractions	-
HTR2C	DULOXETINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	Capeserod	agonist	GuideToPharmacologyInteractions	-
HTR2C	QUETIAPINE	-	TdgClinicalTrial TEND	-
HTR2C	MINAPRINE	antagonist	TdgClinicalTrial TEND DrugBank	17139284 2975224 1361012 17016423
HTR2C	METHIXENE HYDROCHLORIDE	antagonist	ChEMBLInteractions	-
HTR2C	BROMOCRIPTINE	agonist	GuideToPharmacologyInteractions	-
HTR2C	AGOMELATINE	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	15289999
HTR2C	PROMAZINE	antagonist	TdgClinicalTrial TEND DrugBank	17139284 17016423
HTR2C	SB-243213	antagonist	GuideToPharmacologyInteractions	-
HTR2C	PROPIOMAZINE	antagonist	TdgClinicalTrial TEND DrugBank	17139284 17016423
HTR2C	TEDATIOXETINE	antagonist	TdgClinicalTrial ChEMBLInteractions	-
HTR2C	TRIFLUOPERAZINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	CHLOROPHENYLPYPERAZINE	agonist	GuideToPharmacologyInteractions	-
HTR2C	THIETHYLPERAZINE	-	TdgClinicalTrial TEND	-
HTR2C	TRYPTAMINE	agonist	GuideToPharmacologyInteractions	-
HTR2C	OLANZAPINE PAMOATE	antagonist	ChEMBLInteractions	-
HTR2C	RENZAPRIDE	-	TdgClinicalTrial	-
HTR2C	CHEMBL323356	antagonist	GuideToPharmacologyInteractions	-
HTR2C	VOLINANSERIN	antagonist	GuideToPharmacologyInteractions	-
HTR2C	ACETIC ACID	antagonist	GuideToPharmacologyInteractions	-
HTR2C	MIANSERIN	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	11004734
HTR2C	CHEMBL76781	agonist	GuideToPharmacologyInteractions	-
HTR2C	LYSERGIDE	agonist	GuideToPharmacologyInteractions	-
HTR2C	ILOPERIDONE	-	PharmGKB	-
HTR2C	OXYMETAZOLINE	agonist	GuideToPharmacologyInteractions	-
HTR2C	CHEMBL134519	agonist	GuideToPharmacologyInteractions	-
HTR2C	ARIPRAZOLE	agonist antagonist	GuideToPharmacologyInteractions DrugBank	17848919
HTR2C	CYAMEMAZINE	antagonist	GuideToPharmacologyInteractions	-
HTR2C	CHEMBL6616	agonist	GuideToPharmacologyInteractions	-
HTR2C	TEGASEROD	antagonist	DrugBank	15466450
IL1R1	TRETINOIN	-	NCI	2465548
IL1R1	ALCOHOL	-	NCI	16272348
IL1R1	GENISTEIN	-	NCI	10400830
IL1R1	CHLORFENSON	-	NCI	7539780
IL1R1	ANAKINRA	inhibitor antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	17083033 9555664 12355453 12817089 10210771 17498496 17352828 11752352
IL1R1	AMG-108	antagonist	ChEMBLInteractions	-
IL1R1	HEMIN	agonist	GuideToPharmacologyInteractions	-
IL1R1	OXANDROLONE	antagonist	GuideToPharmacologyInteractions	-
IL1R1	EPOETIN ALFA	-	NCI	16337691
IL7	SODIUM beta-NICOTINAMIDE ADENINE	-	NCI	17215438
IL7	SIROLIMUS	-	NCI	14657335
IL7	EDARAVONE	-	NCI	12885363
ITGAL	BUSULFAN	-	NCI	9389690
ITGAL	MYCOPHENOLATE MOFETIL	-	NCI	14550820
ITGAL	LIFITEGRAST	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	27883115
ITGAL	RESINIFERATOXIN	-	NCI	9374538
ITGAL	CYCLOPHOSPHAMIDE	-	NCI	9389690
ITGAL	EPOETIN ALFA	-	NCI	9310190
ITGAL	FLUOROURACIL	-	NCI	8888499
ITGAL	ROVELIZUMAB	antagonist antibody	GuideToPharmacologyInteractions ChEMBL	-
ITGAL	BELAPERIDONE	-	TdgClinicalTrial	-
ITGAL	ATPGAMMAS	-	NCI	9389690
ITGAL	CLOBETASOL PROPIONATE	-	NCI	11555673
ITGAL	ETOPOSIDE	-	NCI	9389690
ITGAL	LOVASTATIN	-	DrugBank	10493852
ITGAL	ODULIMOMAB	inhibitor	ChEMBLInteractions	-
ITGAL	INTERFERON BETA-1A	-	NCI	11412874
ITGAL	TACROLIMUS	-	NCI	14550820
ITGAL	EFALIZUMAB	inhibitor antibody	TdgClinicalTrial GuideToPharmacologyInteractions	19170413 11752352 17053736
ITGAL	PHORBOL MYRISTATE ACETATE	-	NCI	2564369 8104888 2547869 7693806
ITGAL	THROMBIN	-	NCI	8598231
ITGAL	CHEMBL232942	-	DrugBank	10592235
ITGAL	CHEMBL478464	-	DrugBank	10592235
ITGAL	SIROLIMUS	-	NCI	10515383
ITGAL	HYDROGEN PEROXIDE	-	NCI	9624736
ITGAL	STAUROSPORINE	-	NCI	1356124

ITGAL	CYCLOSPORINE	-	NCI	7907109 14550820 11555673 10515383
ITGAV	BELAPERIDONE	-	TdgClinicalTrial	-
ITGAV	INTETUMUMAB	antagonist	TdgClinicalTrial ChembInteractions	-
ITGAV	CYTARABINE	-	NCI	9252649
ITGAV	CILENGITIDE	antagonist inhibitor	TALC TdgClinicalTrial GuideToPharmacology	-
ITGAV	DI17E6	inhibitor	ChembInteractions	-
ITGAV	VOLOCIXIMAB	-	TdgClinicalTrial	-
ITGAV	ETARACIZUMAB	antagonist antibody	GuideToPharmacologyInteractions Chemb	-
ITGAV	ABCIXIMAB	inhibitor	ChembInteractions	-
ITGAV	STX-100	inhibitor	ChembInteractions	-
ITGAV	RUSALATIDE ACETATE	activator	GuideToPharmacologyInteractions	-
ITPR2	SODIUM ORTHOVANAD	antagonist	GuideToPharmacologyInteractions	-
ITPR2	CHEMBL420806	activator	GuideToPharmacologyInteractions	-
ITPR2	INS(1,4,5)P3	activator	GuideToPharmacologyInteractions	-
ITPR2	ADENOPHOSTIN A	activator	GuideToPharmacologyInteractions	-
ITPR2	ca2	activator	GuideToPharmacologyInteractions	-
ITPR3	INS(1,4,5)P3	activator	GuideToPharmacologyInteractions	-
ITPR3	ca2	activator	GuideToPharmacologyInteractions	-
ITPR3	SODIUM ORTHOVANAD	antagonist	GuideToPharmacologyInteractions	-
JAK2	LS-104	inhibitor	ChembInteractions	-
JAK2	RUXOLITINIB	inhibitor	MyCancerGenome TdgClinicalTrial Oncok	18805579 16293597 24398328 25260694 25515960 20339092 21926964 23400675 22829971 15781101 16081687 22271575 22955920 20631743 25207766 19287384 20585391 21120162 22041374 16709929 24251790 23061804 22875628 19470474 18394554 21689158 23115274 21393331 23514013 22368270 25157968 22818858 23630205 24986690 24404189 22422826 26472029 22899477 22571758
JAK2	CT-1578	inhibitor	ChembInteractions	-
JAK2	ENMD-2076	-	TdgClinicalTrial	-
JAK2	DECERNOTINIB	inhibitor	GuideToPharmacologyInteractions	-
JAK2	AT-9283	inhibitor	TALC MyCancerGenome GuideToPharmac	-
JAK2	CHEMBL480411	-	DrugBank	10592235
JAK2	CHEMBL316050	inhibitor	GuideToPharmacologyInteractions	-
JAK2	RGB-286638	inhibitor	GuideToPharmacologyInteractions	-
JAK2	ITACITINIB	inhibitor	GuideToPharmacologyInteractions	-
JAK2	TG-02	inhibitor	GuideToPharmacologyInteractions Chemb	-
JAK2	XL-019	inhibitor	TdgClinicalTrial GuideToPharmacologyInter	-
JAK2	CHEMBL500779	-	DrugBank	10592235
JAK2	CHEMBL2062804	inhibitor	GuideToPharmacologyInteractions	-
JAK2	FEDRATINIB	inhibitor	MyCancerGenome TdgClinicalTrial CKB Gu	24398328 21926964 18394554
JAK2	PEFICITINIB	inhibitor	ChembInteractions	-
JAK2	Cerdulatinib	inhibitor	GuideToPharmacologyInteractions	-
JAK2	PIBOSEROD	inhibitor	TTD	-
JAK2	RUXOLITINIB PHOSPHATE	inhibitor	ChembInteractions MyCancerGenomeClin	-
JAK2	NS-018	inhibitor	GuideToPharmacologyInteractions Chemb	-
JAK2	TOFACITINIB CITRATE	inhibitor	ChembInteractions	-
JAK2	BARICITINIB	inhibitor	TdgClinicalTrial GuideToPharmacologyInter	-
JAK2	PEMBROLIZUMAB	-	CKB CIViC	27433843
JAK2	PACRITINIB	inhibitor	TdgClinicalTrial GuideToPharmacologyInter	-
JAK2	CHEMBL21156	inhibitor	CKB GuideToPharmacologyInteractions Dr	22916261 10592235
JAK2	MOMELTINIB	inhibitor	CKB GuideToPharmacologyInteractions Ch	24398328 21926964
JAK2	BMS-911543	inhibitor	GuideToPharmacologyInteractions Chemb	-
JAK2	LESTAUTINIB	inhibitor	TdgClinicalTrial CKB ChembInteractions	21926964
JAK2	TOFACITINIB	inhibitor antagonist	DrugBank	10592235
JAK2	PAROXETINE	inhibitor	GuideToPharmacologyInteractions	-
JAK2	FILGOTINIB	inhibitor	TdgClinicalTrial GuideToPharmacologyInter	-
JAK2	GANDOTINIB	inhibitor	MyCancerGenome GuideToPharmacologyInter	-
JAK2	CHEMBL1213492	inhibitor	TTD	-
JAK2	AC-430	inhibitor	TdgClinicalTrial ChembInteractions	-
JAK2	AZD-1480	inhibitor	MyCancerGenome CKB GuideToPharmacol	21926964
KDM7A	CHEMBL2164243	inhibitor	GuideToPharmacologyInteractions	-
KCNH8	GUANIDINE HYDROCHLORIDE	blocker	ChembInteractions	-
KCNH8	TEDISAMIL	blocker	ChembInteractions	-
KCNH8	CHEMBL116590	channel blocker	GuideToPharmacologyInteractions	-
KCNH8	DALFAMPRIDINE	blocker	ChembInteractions	-
KCNH8	NERISPIRIDINE	blocker	ChembInteractions	-
KCNMB4	MICONAZOLE	inhibitor	DrugBank	1376313 8760033
KCNN3	MICONAZOLE	inhibitor	DrugBank	1376313 8760033
KCNT1	LOXAPINE	activator	GuideToPharmacologyInteractions	-
KCNT1	CLOFILUM	channel blocker	GuideToPharmacologyInteractions	-
KCNT1	NICLOSAMIDE	activator	GuideToPharmacologyInteractions	-
KDM4C	VASOPRESSIN TANNATE	inhibitor	GuideToPharmacologyInteractions	-
LAMA3	OCRIPLASMIN	-	ChembInteractions	-
LRP2	CARBOQUONE	-	PharmGKB	-
LRP2	INSULIN HUMAN	-	DrugBank	17139284 17016423
LRP2	UROKINASE	-	DrugBank	7959795 17139284 8241286 1280065 17016423
LSS	MEDROXYPROGESTERONE ACETATE	inhibitor	GuideToPharmacologyInteractions	-
LSS	CHEMBL481608	inhibitor	GuideToPharmacologyInteractions	-
LSS	CHEMBL2164238	inhibitor	GuideToPharmacologyInteractions	-
LSS	CHEMBL304858	inhibitor	GuideToPharmacologyInteractions DrugBar	17139284 17016423
LSS	LANOSTEROL	-	DrugBank	17139284 17016423
LSS	CHEMBL516921	inhibitor	GuideToPharmacologyInteractions	-
LSS	VISNAGIN	inhibitor	GuideToPharmacologyInteractions	-
LSS	CHEMBL2219824	inhibitor	GuideToPharmacologyInteractions	-
PLIN3	IDURSULFASE	-	TdgClinicalTrial TEND DrugBank	18201153 17139284 17016423 18038146 19707363
PLIN3	GALSULFASE	-	TdgClinicalTrial DrugBank	17016423 18709516
MAP3K10	CEP-1347	inhibitor	ChembInteractions	-
MAP3K5	2-ETHOXYETHANOL	inhibitor	GuideToPharmacologyInteractions	-
MAP3K5	GS-4997	inhibitor	ChembInteractions	-
MGA	MIGLITOL	inhibitor	ChembInteractions	-
MGA	ACARBOSE	inhibitor	ChembInteractions	-
MKL1	LATRUNCULIN B	-	DrugBank	10592235
MMP20	CHEMBL311932	-	DrugBank	10592235
MMP20	FENOFIBRATE	inhibitor	DrugBank	17606858 17353509
MMP20	MARIMASTAT	inhibitor	DrugBank	10852638 10669951
MTAP	CHEMBL551561	-	DrugBank	10592235 17139284 17016423

MTAP	FORMYCIN	-	DrugBank	17139284 17016423
MTAP	ADENINE	-	DrugBank	16631464 17041099 17090056
MTAP	LALANOSINE	-	NCI	16505107
MTAP	L-FLORNITHINE	-	NCI	15534104
MTAP	METHYLTHIOADENOSINE	-	DrugBank	17139284 17016423
MYLK	BEPRIDIL	activator	GuideToPharmacologyInteractions	-
NADSYN1	L-GLUTAMATE	-	DrugBank	17139284 17016423
NDUFB5	NV-128	inhibitor	ChemblInteractions	-
NDUFB5	METFORMIN HYDROCHLORIDE	inhibitor	ChemblInteractions	-
NDUFB5	ME-344	inhibitor	ChemblInteractions	-
NDUFB5	CHEMBL1161866	-	DrugBank	17139284 17016423
NGF	TANEZUMAB	inhibitor	TdgClinicalTrial ChemblInteractions	-
NGF	Fasinumab	inhibitor	ChemblInteractions	-
NGF	FULRANUMAB	inhibitor	ChemblInteractions	-
NGF	PG-110	-	TdgClinicalTrial	-
NGF	CLENBUTEROL	stimulator	DrugBank	10525174 10403429 11146120 10637819 11221812
NGF	METHADONE	-	PharmGKB	-
NLGN1	FLUOROURACIL	-	PharmGKB	-
NOTCH1	HYDROCORTISONE	-	NCI	11948681
NOTCH1	REGN-421	antibody	MyCancerGenome	-
NOTCH1	NIROGACESTAT	inhibitor	MyCancerGenome CKB	26202948 25564152 23868008
NP5R1	HALOTHANE	-	DrugBank	10913255 12826849 11961111
NTRK3	ALTIRATINIB	inhibitor	ChemblInteractions	-
NTRK3	AZD-6918	inhibitor	ChemblInteractions	-
NTRK3	CHEMBL2007421	inhibitor	GuideToPharmacologyInteractions	-
NTRK3	LOXO-101	inhibitor	ChemblInteractions	-
NTRK3	MIDOSTAURIN	-	CGI	23131561 21148487
NTRK3	AZD-7451	inhibitor	ChemblInteractions	-
NTRK3	ENTRECTINIB	-	OncoKB CIVIC	26884591 26216294 28183697
NTRK3	PLX-3397	inhibitor	GuideToPharmacologyInteractions	-
NTRK3	RADICICOL	-	GuideToPharmacologyInteractions	-
NTRK3	CEP-2563	inhibitor	ChemblInteractions	-
NTRK3	LESTAURTINIB	inhibitor	TdgClinicalTrial ChemblInteractions	-
NTRK3	PLX-7486	inhibitor	ChemblInteractions	-
NTRK3	THYROXINE	-	NCI	10452218
NUBPL	ILOPERIDONE	-	PharmGKB	-
PARD3B	OXALUPLATIN	-	PharmGKB	-
PARD3B	FLUOROURACIL	-	PharmGKB	-
PBRM1	EVEROLIMUS	-	CGI	-
PCSK1	CHEMBL566340	inhibitor	GuideToPharmacologyInteractions	-
PCSK1	CALCITONIN	-	NCI	14566018
PCSK1	INSULIN HUMAN	-	DrugBank	17139284 17016423
PDE2A	PENTOXIFYLLINE	inhibitor	ChemblInteractions	-
PDE2A	EHNA	inhibitor	GuideToPharmacologyInteractions	-
PDE2A	TOFISOPAM	inhibitor	DrugBank	20967473
PDE2A	MILRINONE	inhibitor	GuideToPharmacologyInteractions	-
PDE2A	CHEMBL395336	activator	GuideToPharmacologyInteractions DrugBank	10592235 17139284 17016423
PDE2A	CHEMBL370962	inhibitor	GuideToPharmacologyInteractions	-
PDE2A	ISOBUTYLMETHYLXANTHINE	-	DrugBank	10592235
PDE2A	DIPYRIDAMOLE	inhibitor	ChemblInteractions	-
PDGFD	TANDUTINIB	-	DrugBank	-
PDGFD	SUNITINIB	inhibitor	MyCancerGenomeClinicalTrial	-
CPQ	L-GLUTAMATE	-	DrugBank	10592235 17139284 17016423
PIK3C2G	SONOLISIB	inhibitor	MyCancerGenome	-
PIK3C2G	APITOLISIB	inhibitor	MyCancerGenome	-
PIK3C2G	SF-1126	inhibitor	MyCancerGenome	-
PIK3C2G	PICTILISIB	inhibitor	MyCancerGenome	-
PIK3C2G	PI-103	inhibitor	MyCancerGenome	-
PIK3C2G	ALPELISIB	inhibitor	MyCancerGenome	-
PIK3C2G	COPANLISIB	inhibitor	MyCancerGenome	-
PIK3C2G	QUERCETIN	inhibitor	MyCancerGenome	-
PIK3C2G	GSK-2636771	inhibitor	MyCancerGenome	-
PIK3C2G	BUPARLISIB	inhibitor	MyCancerGenome	-
PIK3C2G	PF-04691502	inhibitor	MyCancerGenome	-
PIK3C2G	DACTOLISIB	inhibitor	MyCancerGenome	-
PIK3C2G	GEDATOLISIB	inhibitor	MyCancerGenome	-
PIK3C2G	PILARALISIB (CHEMBL3218575)	inhibitor	MyCancerGenome	-
PIK3C2G	VOXTALISIB	inhibitor	MyCancerGenome	-
PLCG2	IBRUTINIB	-	CGI DoCM	24869598
PLCL1	QUINACRINE	inhibitor	DrugBank	8469910 11207202 7573467 1860838 2551803
PPP1CC	CALYCULIN A	-	DrugBank	17139284 17016423
PPP1CC	MOTUPORIN	-	DrugBank	16343532
PRKCA	SEBACIC ACID	inhibitor	GuideToPharmacologyInteractions	-
PRKCA	GSK-690693	inhibitor	ChemblInteractions	-
PRKCA	CEP-2563	inhibitor	ChemblInteractions	-
PRKCA	INGENOL MEBUTATE	activator ligand	TdgClinicalTrial GuideToPharmacologyInteractions	15126366
PRKCA	BALANOL	inhibitor	GuideToPharmacologyInteractions	-
PRKCA	MIDOSTAURIN	inhibitor	MyCancerGenome ChemblInteractions	-
PRKCA	APRINOCARSEN SODIUM	antisense oligonucleotide	TALC	-
PRKCA	RUBOXISTAURIN	inhibitor	GuideToPharmacologyInteractions	-
PRKCA	TAMOXIFEN	-	DrugBank	3157445
PRKCA	CHEMBL1236539	inhibitor	GuideToPharmacologyInteractions	-
PRKCA	ENZASTAURIN	inhibitor	MyCancerGenome GuideToPharmacologyInteractions	-
PRKCA	(7S)-HYDROXYL-STAUROSPORINE	inhibitor	ChemblInteractions	-
PRKCA	BRVOSTATIN	-	TdgClinicalTrial	-
PRKCA	SOTRASTAURIN ACETATE	inhibitor	TTD	-
PRKCA	GO-6976	inhibitor	GuideToPharmacologyInteractions	-
PRKCA	DEXFOSFOSERINE	-	DrugBank	16114872 14698304 17367165 12269833
PRKCA	QUERCETIN	inhibitor	MyCancerGenome	-
PRKCA	SOTRASTAURIN	inhibitor	GuideToPharmacologyInteractions Chembl	-
PRKCA	VITAMIN E	-	DrugBank	9430404 11736999 17139284 17016423 11850093
PRKCA	ELLAGIC ACID	inhibitor, competitive	DrugBank	9581512
PRKCH	SOTRASTAURIN	inhibitor	GuideToPharmacologyInteractions Chembl	-
PRKCH	TRAMETINIB	-	CGI	-
PRKCH	BALANOL	inhibitor	GuideToPharmacologyInteractions	-

PRKCH	IMATINIB	-	CGI	-
PRKCH	BRYOSTATIN	-	TdgClinicalTrial	-
PRKCH	GSK-690693	inhibitor	ChEMBLInteractions	-
PRKCH	INGENOL MEBUTATE	-	TdgClinicalTrial	-
PRKCH	MIDOSTAURIN	inhibitor	ChEMBLInteractions	-
PRKCH	QUERCETIN	inhibitor	MyCancerGenome	-
PRKCH	(7S)-HYDROXYL-STAUROSPORINE	inhibitor	ChEMBLInteractions	-
PRKCH	CEP-2563	inhibitor	ChEMBLInteractions	-
PRKD1	QUERCETIN	inhibitor	MyCancerGenome	-
PRKD1	GSK-690693	inhibitor	ChEMBLInteractions	-
PRKD1	SOTRASTAUURIN	inhibitor	ChEMBLInteractions	-
PRKD1	BRYOSTATIN	-	TdgClinicalTrial	-
PRKD1	RESVERATROL	-	NCI	11008129
PRKD1	VASOPRESSIN	-	NCI	11514571
PRKD1	MIDOSTAURIN	inhibitor	ChEMBLInteractions	-
PRKD1	(7S)-HYDROXYL-STAUROSPORINE	inhibitor	ChEMBLInteractions	-
PRKD1	CEP-2563	inhibitor	ChEMBLInteractions	-
PRKD1	GO-6976	inhibitor	GuideToPharmacologyInteractions	-
PRKDC	WORTMANNIN	inhibitor	GuideToPharmacologyInteractions	-
PRKDC	CC-115	inhibitor	ChEMBLInteractions	-
PRKDC	CHEMBL188678	inhibitor	GuideToPharmacologyInteractions	-
PRKDC	CHEMBL1086377	inhibitor	GuideToPharmacologyInteractions	-
PRKDC	PI-103	inhibitor	GuideToPharmacologyInteractions	-
PRKDC	CHEMBL1081312	inhibitor	GuideToPharmacologyInteractions	-
PRKDC	SF-1126	-	TdgClinicalTrial DrugBank	-
PRMT8	PREGNENOLONE	inhibitor	GuideToPharmacologyInteractions	-
PTDSS1	DEXFOSFOSERINE	-	DrugBank	15130088 12912985 12761285 16627002
PTGER3	ENPROSTIL	agonist	GuideToPharmacologyInteractions	-
PTGER3	CHEMBL1317823	antagonist	GuideToPharmacologyInteractions	-
PTGER3	CLOPROSTENOL (CHEMBL2220404)	agonist	GuideToPharmacologyInteractions	-
PTGER3	CARBACYCLIN	agonist	GuideToPharmacologyInteractions	-
PTGER3	CHEMBL1628262	agonist	GuideToPharmacologyInteractions	-
PTGER3	ILOPROST	agonist	GuideToPharmacologyInteractions	-
PTGER3	CHEMBL357834	agonist	GuideToPharmacologyInteractions	-
PTGER3	BERAPROST	agonist	GuideToPharmacologyInteractions	-
PTGER3	CHEMBL565591	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	-
PTGER3	CICAPROST	agonist	GuideToPharmacologyInteractions	-
PTGER3	BIMATOPROST	agonist	TdgClinicalTrial DrugBank	14733708 16877408 19232013
PTGER3	DINOPROSTONE	agonist	TdgClinicalTrial GuideToPharmacologyInteractions	17329241 18715952 20599704 19788928
PTGER3	CHEMBL358653	antagonist	GuideToPharmacologyInteractions	-
PTGER3	DINOPROST	agonist	GuideToPharmacologyInteractions	-
PTGER3	SULPROSTONE	agonist	GuideToPharmacologyInteractions	-
PTGER3	MISOPROSTOL	agonist	GuideToPharmacologyInteractions ChEMBL	18472336 16039053 12611496 12097143 9313928 11602631
PTGER3	FLUPROSTENOL	agonist	GuideToPharmacologyInteractions	-
PTGER3	TREPROSTINIL	agonist	GuideToPharmacologyInteractions	-
RAD52	HYDROCHLOROTHIAZIDE	-	PharmGKB	-
RAPGEF4	CHEMBL2313646	inhibitor	GuideToPharmacologyInteractions	-
RB1	PALBOCICLIB	-	CKB CGI CIVIC	27012813 22711607 20473330 27020857 26649278 27488531 120354191
RB1	TRETINOIN	-	NCI	7521842
RB1	INSULIN HUMAN	-	DrugBank	17139284 17016423
RFC1	PRALATREXATE	-	ClarityFoundationClinicalTrial	-
RICTOR	INK-128	inhibitor	MyCancerGenome	-
RICTOR	OSI-027	inhibitor	MyCancerGenome	-
RICTOR	AZD-2014	-	CIVIC	28028034
RICTOR	AZD-8055	inhibitor	MyCancerGenome	-
RUSC1	MEDRONIC ACID	-	PharmGKB	-
RVR3	RUTHENIUM RED	channel blocker	GuideToPharmacologyInteractions	-
RVR3	MAGNESIUM	antagonist	GuideToPharmacologyInteractions	-
RVR3	CAFFEINE	activator	GuideToPharmacologyInteractions	-
RVR3	DANTROLENE	antagonist	GuideToPharmacologyInteractions	-
RVR3	ca2	activator antagonist	GuideToPharmacologyInteractions	-
RVR3	ADENOSINE TRIPHOSPHATE	activator	GuideToPharmacologyInteractions	-
RVR3	DANTROLENE SODIUM	antagonist	ChEMBLInteractions	-
RVR3	RYANODINE	activator	GuideToPharmacologyInteractions	-
SBF2	PAROXETINE	-	PharmGKB	-
SCN1A	NW-3509	blocker	ChEMBLInteractions	-
SCN1A	TETRACAINE	blocker	ChEMBLInteractions	-
SCN1A	ROPIVACAINE HYDROCHLORIDE	blocker	ChEMBLInteractions	-
SCN1A	PROCAINAMIDE HYDROCHLORIDE	blocker	ChEMBLInteractions	-
SCN1A	PROCAINE HYDROCHLORIDE	blocker	ChEMBLInteractions	-
SCN1A	PHENYTOIN	blocker	TdgClinicalTrial ChEMBLInteractions TEND	-
SCN1A	INDECAINIDE HYDROCHLORIDE	blocker	ChEMBLInteractions	-
SCN1A	PROPOXYCAINE HYDROCHLORIDE	blocker	ChEMBLInteractions	-
SCN1A	PHENYTOIN SODIUM	blocker	ChEMBLInteractions	-
SCN1A	DISOPYRAMIDE PHOSPHATE	blocker	ChEMBLInteractions	-
SCN1A	ORPHENADRINE CITRATE	blocker	ChEMBLInteractions	-
SCN1A	PRILOCAINE	blocker	ChEMBLInteractions	-
SCN1A	LAMOTRIGINE	blocker	PharmGKB ChEMBLInteractions	-
SCN1A	ORPHENADRINE (CHLORIDE)	blocker	ChEMBLInteractions	-
SCN1A	LACOSAMIDE	blocker	ChEMBLInteractions	-
SCN1A	LEVETIRACETAM	blocker	TTD	-
SCN1A	SAFINAMIDE	-	TdgClinicalTrial	-
SCN1A	PROPAPENONE HYDROCHLORIDE	blocker	ChEMBLInteractions	-
SCN1A	BENOXINATE HYDROCHLORIDE	blocker	ChEMBLInteractions	-
SCN1A	DYCLONINE HYDROCHLORIDE	blocker	ChEMBLInteractions	-
SCN1A	PRIMIDONE	blocker	ChEMBLInteractions	-
SCN1A	IRAMPANEL	blocker	ChEMBLInteractions	-
SCN1A	OXCARBAZEPINE	blocker	ChEMBLInteractions	-
SCN1A	ETHOTOIN	blocker	ChEMBLInteractions	-
SCN1A	CHLOROPROCAINE HYDROCHLORIDE	blocker	ChEMBLInteractions	-
SCN1A	TOCAINIDE HYDROCHLORIDE	blocker	ChEMBLInteractions	-
SCN1A	QUINIDINE POLYGALACTURONATE	blocker	ChEMBLInteractions	-
SCN1A	VERATRIDINE	activator	GuideToPharmacologyInteractions	-
SCN1A	FOSPHENYTOIN SODIUM	blocker	ChEMBLInteractions	-
SCN1A	LIDOCAINE	blocker	ChEMBLInteractions	-

SCN1A	HEXYLCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN1A	RUFINAMIDE	blocker	ChemblInteractions	-
SCN1A	SAXITOXIN	channel blocker	GuideToPharmacologyInteractions	-
SCN1A	PHENAZOPYRIDINE HYDROCHLORIDE	blocker inhibitor	ChemblInteractions DrugBank	8799190 20976818
SCN1A	TETRACAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN1A	ZONISAMIDE	blocker inhibitor	TdgClinicalTrial ChemblInteractions TEND	19557119 20001433 19948168 15511691 11752352 20025128 14704463 18433351
SCN1A	CARBAMAZEPINE	blocker	ChemblInteractions	-
SCN1A	DRONEDARONE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN1A	NITRAZEPAM	-	TdgClinicalTrial TEND DrugBank	2450203
SCN1A	QUINIDINE SULFATE	blocker	ChemblInteractions	-
SCN1A	ARTICAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN1A	ETIDOCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN1A	MEPIVACAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN1A	NKTR-171	blocker	ChemblInteractions	-
SCN1A	RALFINAMIDE	blocker	ChemblInteractions	-
SCN1A	PRILOCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN1A	RILUZOLE	blocker	ChemblInteractions	-
SCN1A	PHENACEMIDE	blocker inhibitor	TdgClinicalTrial ChemblInteractions TEND	3959032 11752352 17139284 17016423
SCN1A	PERMETHRIN	inhibitor	DrugBank	19766671 19960691 14651650 19171193 20881019
SCN1A	ESLICARBAZEPINE ACETATE	blocker	ChemblInteractions	-
SCN1A	PROPARACAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN1A	LIDOCAINE HYDROCHLORIDE HYDRATE	blocker	ChemblInteractions	-
SCN1A	MORICIZINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN1A	MEPHENYTOIN	blocker	ChemblInteractions	-
SCN1A	TOPIRAMATE	blocker inhibitor	TdgClinicalTrial ChemblInteractions TEND	15508261 15526956 11948006 17621480 12861512
SCN1A	MERETHOXYLLINE PROCAINE	blocker	ChemblInteractions	-
SCN1A	TETRODOTOXIN	channel blocker	TdgClinicalTrial GuideToPharmacologyInteractions	17663442
SCN1A	QUINIDINE GLUCONATE	blocker	ChemblInteractions	-
SCN1A	MEXILETINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN1A	DRONEDARONE	inhibitor	DrugBank	12890054
SCN1A	NERISPIRDINE	blocker	ChemblInteractions	-
SCN1A	CHEMBL270497	gating inhibitor	GuideToPharmacologyInteractions	-
SCN1A	ESLICARBAZEPINE	blocker	ChemblInteractions	-
SCN9A	CARBAMAZEPINE	blocker	ChemblInteractions	-
SCN9A	VERATRIDINE	activator	GuideToPharmacologyInteractions	-
SCN9A	PRILOCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	ESLICARBAZEPINE ACETATE	blocker	ChemblInteractions	-
SCN9A	PRILOCAINE	blocker	ChemblInteractions	-
SCN9A	RG6029	blocker	ChemblInteractions	-
SCN9A	DISOPYRAMIDE PHOSPHATE	blocker	ChemblInteractions	-
SCN9A	ARTICAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	NERISPIRDINE	blocker	ChemblInteractions	-
SCN9A	RUFINAMIDE	blocker modulator	ChemblInteractions DrugBank	23221868
SCN9A	AZD3161	blocker	ChemblInteractions	-
SCN9A	PHENYTOIN SODIUM	blocker	ChemblInteractions	-
SCN9A	ORPHENADRINE CITRATE	blocker	ChemblInteractions	-
SCN9A	PRIMIDONE	blocker	ChemblInteractions	-
SCN9A	PROPARACAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	RALFINAMIDE	blocker	ChemblInteractions	-
SCN9A	PF-05089771	blocker	ChemblInteractions	-
SCN9A	MORICIZINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	QUINIDINE POLYGALACTURONATE	blocker	ChemblInteractions	-
SCN9A	RILUZOLE	blocker	ChemblInteractions	-
SCN9A	PROCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	IRAMPANEL	blocker	ChemblInteractions	-
SCN9A	DYCLONINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	ROPIVACAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	RAXATRIGINE	blocker	ChemblInteractions	-
SCN9A	PHENACEMIDE	blocker	ChemblInteractions	-
SCN9A	PYRIMETHAMINE	channel blocker	GuideToPharmacologyInteractions	-
SCN9A	PHENAZOPYRIDINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	LIDOCAINE	blocker	TdgClinicalTrial ChemblInteractions TEND	-
SCN9A	NW-3509	blocker	ChemblInteractions	-
SCN9A	TOPIRAMATE	blocker	ChemblInteractions	-
SCN9A	TOCAINIDE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	HEXYLCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	RANOLAZINE	blocker inhibitor	TdgClinicalTrial DrugBank TTD	19077543 11752352
SCN9A	PROCAINAMIDE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	XEN403	blocker	ChemblInteractions	-
SCN9A	ESLICARBAZEPINE	blocker	ChemblInteractions	-
SCN9A	TETRACAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	FOSPHENYTOIN SODIUM	blocker	ChemblInteractions	-
SCN9A	DSP-2230	blocker	ChemblInteractions	-
SCN9A	MEPIVACAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	MERETHOXYLLINE PROCAINE	blocker	ChemblInteractions	-
SCN9A	QUINIDINE SULFATE	blocker	ChemblInteractions	-
SCN9A	PROPOXYCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	FUNAPIDE	-	TdgClinicalTrial	-
SCN9A	LAMOTRIGINE	blocker	ChemblInteractions	-
SCN9A	SAXITOXIN	channel blocker	GuideToPharmacologyInteractions	-
SCN9A	CHEMBL120768	channel blocker	GuideToPharmacologyInteractions	-
SCN9A	MEPHENYTOIN	blocker	ChemblInteractions	-
SCN9A	ZONISAMIDE	blocker inhibitor	TdgClinicalTrial ChemblInteractions DrugBank	19557119 20001433 19948168 15511691 20025128 14704463 18433351
SCN9A	PHENYTOIN	blocker	ChemblInteractions	-
SCN9A	RG7893	blocker	ChemblInteractions	-
SCN9A	LACOSAMIDE	blocker channel blocker	GuideToPharmacologyInteractions Chembl	-
SCN9A	CHLOROPROCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	DRONEDARONE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	TETRODOTOXIN	channel blocker	TdgClinicalTrial GuideToPharmacologyInteractions	-
SCN9A	ORPHENADRINE (CHLORIDE)	blocker	ChemblInteractions	-
SCN9A	INDECAINIDE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	LIDOCAINE HYDROCHLORIDE HYDRATE	blocker	ChemblInteractions	-
SCN9A	TETRACAINE	blocker	ChemblInteractions	-

SCN9A	PROPAFENONE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	SAFINAMIDE	-	TdgClinicalTrial	-
SCN9A	ETIDOCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	MEXILETINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	QUINIDINE GLUCONATE	blocker	ChemblInteractions	-
SCN9A	ETHOTOIN	blocker	ChemblInteractions	-
SCN9A	NKTR-171	blocker	ChemblInteractions	-
SCN9A	BENOXINATE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	OXCARBAZEPINE	blocker	ChemblInteractions	-
SELP	BIMOSIAMOSE	inhibitor	TdgClinicalTrial ChemblInteractions	-
SELP	RO-4905417	inhibitor	ChemblInteractions	-
SELP	DALTEPARIN SODIUM	inhibitor	DrugBank	11044537
SELP	CHEMBL1234621	-	DrugBank	17139284 17016423
SELP	NADROPARIN CALCIUM	inhibitor	DrugBank	16525583 17629851
SELP	RIVIPANSEL	antagonist	ChemblInteractions	-
SELP	RG-1512	inhibitor	ChemblInteractions	-
SLC16A7	PYRUVATE	-	DrugBank	16604139 15953344 17556391 16766717 16597615
SLC5A1	STREPTOZOTOCIN	-	NCI	1722397
SLC5A1	SERGLUFLOZIN ETABONATE	inhibitor	GuideToPharmacologyInteractions	-
SLC5A1	GLUFOSFAMIDE	-	TdgClinicalTrial	-
SLC5A1	SOTAGLUFLOZIN	inhibitor	TdgClinicalTrial GuideToPharmacologyInteractions	-
SLC5A1	EMPAGLUFLOZIN	inhibitor	GuideToPharmacologyInteractions	-
SLC5A1	TOFOGLUFLOZIN	inhibitor	GuideToPharmacologyInteractions	-
SLC5A1	DAPAGLUFLOZIN	inhibitor	GuideToPharmacologyInteractions	-
SLC5A1	CANAGLUFLOZIN	inhibitor	GuideToPharmacologyInteractions DrugBank	23590413
SLC5A1	ERTUGLUFLOZIN	inhibitor	GuideToPharmacologyInteractions	-
SLC5A1	REMOGLUFLOZIN	inhibitor	GuideToPharmacologyInteractions	-
SLC5A1	CHEMBL2018096	inhibitor	GuideToPharmacologyInteractions	-
SLK	DANUSERIB	inhibitor	GuideToPharmacologyInteractions	-
SLK	DASATINIB	inhibitor	TTD	-
SLK	CHEMBL261720	-	DrugBank	10592235
SLK	TOZASERTIB	inhibitor	TTD	-
SRPK2	CHEMBL1230589	-	DrugBank	10592235
SRPK2	ADENINE	-	DrugBank	10592235
TACR1	CHEMBL1965818	-	DrugBank	-
TACR1	SERLOPITANT	antagonist	GuideToPharmacologyInteractions	-
TACR1	VAPREOTIDE	antagonist	TEND DrugBank	11752352 7556407
TACR1	CHEMBL129683	antagonist	GuideToPharmacologyInteractions	-
TACR1	CHEMBL319118	-	DrugBank	-
TACR1	ANASTROZOLE	antagonist	GuideToPharmacologyInteractions	-
TACR1	LANEPITANT	antagonist	GuideToPharmacologyInteractions	-
TACR1	VOFOPITANT	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	-
TACR1	CASOPITANT	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	-
TACR1	VASOPRESSIN	-	NCI	18195491
TACR1	CHEMBL417572	antagonist	GuideToPharmacologyInteractions	-
TACR1	SAREDUTANT	antagonist	GuideToPharmacologyInteractions	-
TACR1	NEUROKININ A	agonist	GuideToPharmacologyInteractions	-
TACR1	MITOMYCIN	antagonist	GuideToPharmacologyInteractions	-
TACR1	VESTIPITANT	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	-
TACR1	EZLOPITANT	antagonist	GuideToPharmacologyInteractions	-
TACR1	CHEMBL1885865	agonist	GuideToPharmacologyInteractions	-
TACR1	BEFETUPITANT	antagonist	GuideToPharmacologyInteractions	-
TACR1	CHEMBL131171	antagonist	GuideToPharmacologyInteractions	-
TACR1	HYDROCORTISONE	antagonist	GuideToPharmacologyInteractions	-
TACR1	NOLPITANTIUM	antagonist	GuideToPharmacologyInteractions	-
TACR1	OSANETANT	antagonist	GuideToPharmacologyInteractions	-
TACR1	NETUPITANT	antagonist	GuideToPharmacologyInteractions DrugBank	25687374
TACR1	ROLAPITANT	antagonist	GuideToPharmacologyInteractions	-
TACR1	APREPITANT	antagonist	TdgClinicalTrial GuideToPharmacologyInteractions	12590540 15121485 12784346 12227806 11752352 17643344
TACR1	KASSININ	agonist	GuideToPharmacologyInteractions	-
TACR1	TRADIPITANT	antagonist	GuideToPharmacologyInteractions	-
TACR1	NALOXONE	antagonist	GuideToPharmacologyInteractions	-
TACR1	NEUROKININ B	agonist	GuideToPharmacologyInteractions	-
TACR1	CHEMBL339486	antagonist	GuideToPharmacologyInteractions	-
TACR1	PHYSALAEMIN	agonist	GuideToPharmacologyInteractions	-
TACR1	FOSAPREPITANT	antagonist	GuideToPharmacologyInteractions	-
TACR1	CHEMBL38763	-	DrugBank	-
TACR1	ELEDOISIN	agonist	GuideToPharmacologyInteractions	-
TACR1	SUBSTANCE P	agonist	GuideToPharmacologyInteractions	-
TGFBR1	CHEMBL570533	-	DrugBank	10592235
TGFBR1	TRIHEXYPHENIDYL	inhibitor	GuideToPharmacologyInteractions	-
TGFBR1	NEOSTIGMINE BROMIDE	inhibitor	GuideToPharmacologyInteractions	-
TGFBR1	CHEMBL537968	-	DrugBank	10592235
TGFBR1	CHEMBL519939	-	DrugBank	10592235
TGFBR1	CHEMBL261454	inhibitor	GuideToPharmacologyInteractions DrugBank	10592235
TGFBR1	GALUNISERTIB	inhibitor	GuideToPharmacologyInteractions Chembl	-
TGFBR1	SB-431542	inhibitor	GuideToPharmacologyInteractions	-
TGFBR1	CHEMBL1824446	inhibitor	GuideToPharmacologyInteractions	-
TGFBR1	CHEMBL121790	-	DrugBank	10592235
TP53	TIRAPAZAMINE	-	NCI	9647614
TP53	DOCEAXEL	-	CKB CIVIC	21399868 22425996
TP53	RITUXIMAB	-	NCI	11895917
TP53	INTERFERON ALFA-2B	-	NCI	16001656
TP53	METHYLPREDNISOLONE	-	NCI	16684279
TP53	FLUOROURACIL	-	PharmGKB	-
TP53	RIZATRIPTAN	-	NCI	14614330
TP53	PUROMYCIN	-	NCI	11866936
TP53	PRAMLINTIDE	-	CGI	-
TP53	TARENFLURBIL	-	NCI	15710360
TP53	CETUXIMAB	-	CIVIC	24957073
TP53	ZINC CHLORIDE	-	NCI	16585387
TP53	BEVACIZUMAB	-	CKB NCI	27466356 21399868 23670029 11720743 17145525 15579019
TP53	INOSITOL	-	NCI	16733561
TP53	CHEMBL1221512	-	NCI	16224182
TP53	PROPYLTHIOURACIL	-	NCI	7790147
TP53	BORTEZOMIB	inhibitor	TALC	-
TP53	GOSSYPOL	-	NCI	16020667

TP53	DOXORUBICIN	-	CKB CGI CIVIC	25658463 21399868 16243804 23165797 26826118 22698404 19569050
TP53	ABEMACICLUB	-	CKB CGI	27271383
TP53	Lesogaberan	-	DrugBank	-
TP53	CHEMBL1235116	-	DrugBank	10592235
TP53	GARLIC	-	NCI	16351512
TP53	GEMCITABINE	-	CKB CGI	27167172 23520471 21389100 27815358 26228206
TP53	AZD-1775	-	CKB CGI	27601554 27196784 21992793 23520471 21389100 19887545 21799033 28652249 22713237 27998224
TP53	DIETHYLSTILBESTROL	-	NCI	15545218
TP53	SIROLIMUS	-	CKB NCI	26144316 16651424
TP53	DECITABINE	-	CGI	-
TP53	OXALIPLATIN	-	CKB CIVIC	24957073 21468686
TP53	SELUMETINIB	-	CKB CIVIC	26343583 26272063 22425996
TP53	TRIFLUOPERAZINE	-	NCI	12415616
TP53	ASPIRIN	acetylation	DrugBank	21475861
TP53	TAMOXIFEN	-	CIVIC	10786679
TP53	CAPECITABINE	-	CIVIC	24957073
TP53	METHIMAZOLE	-	NCI	7790147
TP53	AZD-6738	-	CKB CGI	26563132 28062704
TP53	CARBOPLATIN	-	CKB CIVIC	25567130 25658463 11595686 26494859 27998224
TP53	YONDELIS	-	NCI	16888811
TP53	GRANISETRON	-	ClarityFoundationClinicalTrial	-
TP53	MYCOPHENOLIC ACID	-	NCI	16684279
TP53	THIOTEPA	-	NCI	12058967
TP53	PACLITAXEL	-	PharmGKB CKB NCI	16459017
TP53	MITOMYCIN	-	CGI	-
TP53	PROXYPHYLLINE	-	NCI	16751417
TP53	VESNARINONE	-	NCI	7750082
TP53	URSODIOL	-	NCI	15885361
TP53	STREPTONIGRIN	-	NCI	12027749
TP53	ENALAPRIL	-	NCI	16900775
TP53	HALOPERIDOL	-	NCI	16476148
TXK	ACALABRUTINIB	inhibitor	GuideToPharmacologyInteractions	-
TXK	IBRUTINIB	inhibitor	GuideToPharmacologyInteractions	-
TXK	BOSUTINIB	inhibitor	GuideToPharmacologyInteractions	-
TXNDC12	GLUTATHIONE	-	DrugBank	17139284 17016423
UPP2	FLUOROURACIL	-	PharmGKB	-
UPP2	BRIVUDINE	-	DrugBank	-
UST	NORTRIPTYLINE	-	PharmGKB	-
VAMP1	BOTULINUM TOXIN TYPE B	binder	TdgClinicalTrial TEND DrugBank TTD	11752352 17139284 17016423
WRAP53	CARBOQUONE	-	PharmGKB	-
WRAP53	FLUOROURACIL	-	PharmGKB	-
WRAP53	CYCLOPHOSPHAMIDE	-	PharmGKB	-

Table S9: Results of Drug-Gene interactions analysis by DGIdb. Target genes were altered by SVs in ESCC.

Gene	Drug	Interaction_types	Sources	PMIDs
KCNV2	TEDISAMIL	blocker	ChEMBLInteractions	-
KCNV2	GUANIDINE HYDROCHLORIDE	blocker	ChEMBLInteractions	-
KCNV2	NERISPIRIDINE	blocker	ChEMBLInteractions	-
KCNV2	DALFAMPRIDINE	blocker	ChEMBLInteractions	-
JAK2	CT-1578	inhibitor	ChEMBLInteractions	-
JAK2	AT-9283	inhibitor	TALC MyCancerGenome Gu	-
JAK2	BARICITINIB	inhibitor	TdG ClinicalTrial GuideToPha	-
JAK2	RUXOLITINIB	inhibitor	MyCancerGenome TdG Clini	18805579 16293597 24398328 25260694 25515960 20339092 21926964 23400675 22829971 15781101 16081687 22271575 22955920 20631743 25207766 19287384 20585391 21120162 22041374 16709929 24251790 23061804 22875628 19470474 18394554 21689158 23115274 21393331 23514013 22368270 25157968 22818858 23630205 24986690 24404189 22422826 26472029 22899477 22571758
JAK2	TOFACITINIB	antagonist inhibitor	DrugBank	10592235
JAK2	AZD-1480	inhibitor	MyCancerGenome CKB Gui	21926964
JAK2	BMS-911543	inhibitor	GuideToPharmacologyIntera	-
JAK2	CHEMBL2062804	inhibitor	GuideToPharmacologyIntera	-
JAK2	Cerdulatinib	inhibitor	GuideToPharmacologyIntera	-
JAK2	CHEMBL3116050	inhibitor	GuideToPharmacologyIntera	-
JAK2	DECERNOTINIB	inhibitor	GuideToPharmacologyIntera	-
JAK2	FEDRATINIB	inhibitor	MyCancerGenome TdG Clini	24398328 21926964 18394554
JAK2	FILGOTINIB	inhibitor	TdG ClinicalTrial GuideToPha	-
JAK2	GANDOTINIB	inhibitor	MyCancerGenome GuideTo	-
JAK2	ITACITINIB	inhibitor	GuideToPharmacologyIntera	-
JAK2	CHEMBL21156	inhibitor	CKB GuideToPharmacology	22916261 10592235
JAK2	PAROXETINE	inhibitor	GuideToPharmacologyIntera	-
JAK2	MOMELTOTINIB	inhibitor	CKB GuideToPharmacology	24398328 21926964
JAK2	NS-018	inhibitor	GuideToPharmacologyIntera	-
JAK2	PACRITINIB	inhibitor	TdG ClinicalTrial GuideToPha	-
JAK2	RGB-286638	inhibitor	GuideToPharmacologyIntera	-
JAK2	TG-02	inhibitor	GuideToPharmacologyIntera	-
JAK2	XL-019	inhibitor	TdG ClinicalTrial GuideToPha	-
JAK2	AC-430	inhibitor	TdG ClinicalTrial ChEMBLInte	-
JAK2	PEFICITINIB	inhibitor	ChEMBLInteractions	-
JAK2	RUXOLITINIB PHOSPHATE	inhibitor	ChEMBLInteractions MyCanc	-
JAK2	CHEMBL213492	inhibitor	TTD	-
JAK2	PIBOSEROD	inhibitor	TTD	-
JAK2	LESTAUTINIB	inhibitor	TdG ClinicalTrial CKB Chemb	21926964
JAK2	LS-104	inhibitor	ChEMBLInteractions	-
JAK2	TOFACITINIB CITRATE	inhibitor	ChEMBLInteractions	-
JAK2	IMATINIB	-	CKB	21224473
JAK2	AZD-1208	-	CKB	26472029
JAK2	PICTILISIB	-	CKB	24251790
JAK2	GO-6976	-	CKB	16956345
JAK2	ZSTK-474	-	CKB	24251790
JAK2	SGI-1776	-	CKB	26472029
JAK2	PACLITAXEL	-	CKB	27075627
JAK2	NVP-AU922	-	CKB	24398328
JAK2	PEMBROLIZUMAB	-	CKB CIVIC	27433843
JAK2	CHEMBL500779	-	DrugBank	10592235
JAK2	ENMD-2076	-	TdG ClinicalTrial	-
JAK2	CHEMBL480411	-	DrugBank	10592235
JAK2	DACTOLISIB	-	CKB	24251790
JAK2	RP-6530	-	CKB	-
CCL21	BROMOACETIC ACID	-	NCI	14610196
CCL21	HEPARIN	-	NCI	11286540
COLSA1	COLLAGENASE CLOSTRIDIUM HISTOLYTICUM	-	ChEMBLInteractions	-
COLSA1	OCRIPLASMINE	-	ChEMBLInteractions	-
MAP4K5	BOSUTINIB	inhibitor	GuideToPharmacologyIntera	-
FAS	CHOLECALCIFEROL	-	NCI	9811059
FAS	TESTOSTERONE	-	NCI	10809356
FAS	ASPIRIN	-	NCI	15200494
FAS	SODIUM BUTYRATE	-	NCI	10444408 10720760
FAS	FLUOROURACIL	-	NCI	12845662
FAS	VALPROIC ACID	-	NCI	16328060
FAS	CHLORFENSON	-	NCI	9759874
FAS	ATORVASTATIN	-	NCI	16796407
FAS	RIZATRIPTAN	-	GuideToPharmacologyIntera	12660450 10974031
FAS	TRETINOIN	-	NCI	9792441
FAS	VESNARINONE	-	NCI	9226479
FAS	THROMBIN	-	NCI	16271051
FAS	ARSENIC TRIOXIDE	-	NCI	14719092
FAS	FLOXURIDINE	-	NCI	11115403
FAS	LITHIUM	-	NCI	15475000
FAS	CYCLOPHOSPHAMIDE	-	NCI	11437491
FAS	VITAMIN K	-	NCI	10930097
FAS	TENIPOSIDE	-	NCI	9543255
FAS	DAUNORUBICIN	-	NCI	10216102
FAS	MYCOPHENOLIC ACID	-	NCI	14659903
FAS	EDELFSOSINE	-	NCI	16540473
FOLH1	CAPROMAB	antibody	TdG ClinicalTrial GuideToPha	11016653 9792131 15882479 11752352 9508077
FOLH1	DOCETAXEL	inhibitor	ClarityFoundationClinicalTri	-
FOLH1	CLAVULANIC ACID	-	TdG ClinicalTrial	-
FOLH1	L-GLUTAMATE	-	DrugBank	11916141 15336276 15837926 17139284 17016423
FOLH1	MDX-070	-	ChEMBLInteractions	-
FOLH1	SURAMIN	-	NCI	10861758
FOLH1	STANOLONE	-	NCI	8753752
FOLH1	METHOTREXATE	-	NCI	9816319
AVPR1A	DESMOPRESSIN ACETATE	agonist	ChEMBLInteractions DrugBa	8957254 10731046 10594321 15613460
AVPR1A	LYPRESSIN	agonist	ChEMBLInteractions	-
AVPR1A	FELYPRESSIN	agonist	TdG ClinicalTrial TEND Drug	18655903 11752352 17139284 17016423
AVPR1A	CONIVAPTAN	antagonist	TdG ClinicalTrial GuideToPha	19057376 17919259 16522696 20054444 17202666 11752352 17428103 19663609 17592003 19695403
AVPR1A	TERLIPRESSIN	stimulator	TdG ClinicalTrial TEND Drug	17275806 16011575 16511036 16532916 11752352 17303660
AVPR1A	TOLVAPTAN	antagonist	GuideToPharmacologyIntera	20637957
AVPR1A	ARGIPRESTOCIN	agonist	GuideToPharmacologyIntera	-
AVPR1A	CHEMBL265859	agonist	GuideToPharmacologyIntera	-
AVPR1A	CHEMBL435323	agonist	GuideToPharmacologyIntera	-

Gene	Drug	Interaction_types	Sources	PMIDs
AVPR1A	CHEMBL32447	agonist	GuideToPharmacologyIntera	
AVPR1A	OXYTOCIN	agonist	GuideToPharmacologyIntera	
AVPR1A	AMSACRINE	agonist	GuideToPharmacologyIntera	
AVPR1A	CHEMBL3274309	agonist	GuideToPharmacologyIntera	
AVPR1A	VASOPRESSIN	agonist	TdgClinicalTrial GuideToPha	17275806 16011575 16511036 16532916 17303660
AVPR1A	ATOSIBAN	antagonist	GuideToPharmacologyIntera	
AVPR1A	CHEMBL70099	antagonist	GuideToPharmacologyIntera	
AVPR1A	APRACLONIDINE	antagonist	GuideToPharmacologyIntera	
AVPR1A	APRINDINE	antagonist	GuideToPharmacologyIntera	
AVPR1A	CHEMBL1254024	antagonist	GuideToPharmacologyIntera	
AVPR1A	MOZAVAPTAN	antagonist	GuideToPharmacologyIntera	
AVPR1A	NELIVAPTAN	antagonist	GuideToPharmacologyIntera	
AVPR1A	CHEMBL296908	antagonist	GuideToPharmacologyIntera	
AVPR1A	MERCAPTOPYRINE	antagonist	GuideToPharmacologyIntera	
AVPR1A	RELCOVAPTAN	antagonist	GuideToPharmacologyIntera	
AVPR1A	SATAVAPTAN	antagonist	GuideToPharmacologyIntera	
AVPR1A	ANTHRACENE-9-CARBOXYLIC ACID	antagonist	GuideToPharmacologyIntera	
AVPR1A	ANTIPYRINE	antagonist	GuideToPharmacologyIntera	
AVPR1A	K-252A	antagonist	GuideToPharmacologyIntera	
AVPR1A	CHEMBL307200	antagonist	GuideToPharmacologyIntera	
AVPR1A	CHEMBL307483	antagonist	GuideToPharmacologyIntera	
AVPR1A	CONIVAPTAN HYDROCHLORIDE	antagonist	ChembllInteractions	-
AVPR1A	SELEPRESSIN	agonist	ChembllInteractions	-
AVPR1A	RG7314	antagonist	ChembllInteractions	-
AVPR1A	SRX246	antagonist	ChembllInteractions	-
AVPR1A	SRX251	antagonist	ChembllInteractions	-
AVPR1A	VASOPRESSIN TANNATE	agonist	ChembllInteractions	-
COL4A1	OCRIPLASMIN	-	ChembllInteractions	-
COL4A1	COLLAGENASE CLOSTRIDIUM HISTOLYTICUM	-	ChembllInteractions	-
ACAN	ILOMASTAT	-	DrugBank	10592235
IL21R	DENENICOKIN	-	TdgClinicalTrial	-
TAOK2	DEXFOSFOSERINE	-	DrugBank	10592235
ITGAX	PHORBOL MYRISTATE ACETATE	-	NCI	15665425
MINK1	PF-03715455	inhibitor	GuideToPharmacologyIntera	
AOC3	VEPALIMOMAB	inhibitor	ChembllInteractions	-
AOC3	CEFAZOLIN	antibody	GuideToPharmacologyIntera	
AOC3	PHENELZINE	inhibitor	GuideToPharmacologyIntera	
AOC3	NOVOBIOCIN	inhibitor	GuideToPharmacologyIntera	
AOC3	HYDRALAZINE	-	TdgClinicalTrial	-
FASN	CERULENIN	inhibitor	DrugBank TTD	15878185 10102370 17168665 12181752 20373869 11245456 11752352
FASN	ORLISTAT	inhibitor	TdgClinicalTrial DrugBank	16749788 15138278 15870086 11752352 16091048 15026345
FASN	LIOTHYRONINE SODIUM	-	NCI	9770474
FASN	PALIFERMIN	-	TdgClinicalTrial	-
FASN	CLOZAPINE	-	NCI	17052361
FASN	PACLITAXEL	-	NCI	15657900
FASN	RISPERIDONE	-	NCI	17052361
LAMA3	OCRIPLASMIN	-	ChembllInteractions	-
MEX3C	MEDRONIC ACID	-	PharmGKB	-
SCN1B	ZONISAMIDE	inhibitor	TdgClinicalTrial DrugBank	19557119 20001433 19948168 15511691 20025128 14704463 18433351
ACSS2	ADENOSINE PHOSPHATE	product of	DrugBank	17497934 17350930 17303131 16981708
ACSS2	ADENOSINE TRIPHOSPHATE	-	DrugBank	12493915 17139284 14704009 17016423
TP53	ASPIRIN	acetylation	DrugBank	21475861
TP53	BORTEZOMIB	inhibitor	TALC	-
TP53	AMG-900	-	CKB	24091768
TP53	EPIRUBICIN	-	CKB	17388661 22903472
TP53	DECITABINE	-	CGI	-
TP53	IRINOTECAN	-	CKB	25567130
TP53	TRAMETINIB	-	CKB	27659046
TP53	CYCLOPHOSPHAMIDE	-	CKB	17388661 16243804 26438783
TP53	RIZATRIPTAN	-	NCI	14614330
TP53	LORLATINIB	-	CKB	28285684
TP53	METHYLPREDNISOLONE	-	NCI	16684279
TP53	AMG-337	-	CKB	26432108
TP53	METHIMAZOLE	-	NCI	7790147
TP53	ETOPOSIDE	-	CKB	25964101
TP53	RG-547	-	CKB	17121911
TP53	VEMURAFENIB	-	CKB	26343583 28514312
TP53	CHEMBL303958	-	CKB	21730979
TP53	PANITUMUMAB	-	CKB	28514312
TP53	INTERFERON ALFA-2B	-	NCI	16001656
TP53	GRANISETRON	-	ClarityFoundationClinicalTr	-
TP53	PF-04217903	-	CKB	27659046
TP53	SIROLIMUS	-	CKB NCI	26144316 16651424
TP53	PACLITAXEL	-	PharmGKB CKB NCI	16459017
TP53	DUVELISIB	-	CKB	-
TP53	PD-0325901	-	CKB	26272063
TP53	GANETESPIB	-	CKB	26009011
TP53	OLAPARIB	-	CKB	22172724
TP53	CAPMATINIB	-	CKB	25971938
TP53	PAZOPANIB	-	CKB	26646755 25669829
TP53	ENALAPRIL	-	NCI	16900775
TP53	HALOPERIDOL	-	NCI	16476148
TP53	BEVACIZUMAB	-	CKB NCI	27466356 21399868 23670029 11720743 17145525 15579019
TP53	STREPTONIGRIN	-	NCI	12027749
TP53	URSODIOL	-	NCI	15885361
TP53	SELICICLUB	-	CKB	22862161 26826118
TP53	AZD-5363	-	CKB	26910118
TP53	NAVITOCILAX	-	CKB	27659046 26474387
TP53	SP-600125	-	CKB	22438244
TP53	VX-970	-	CKB	-
TP53	DS-7423	-	CKB	24504419
TP53	TOPOTECAN	-	CKB	26438783
TP53	Tepotinib	-	CKB	26358474
TP53	CARBOPLATIN	-	CKB CIVIC	25567130 25658463 11595686 26494859 27998224
TP53	PROPYLTHIOURACIL	-	NCI	7790147
TP53	DOCETAXEL	-	CKB CIVIC	21399868 22425996

Gene	Drug	Interaction_types	Sources	PMIDs
TP53	RITUXIMAB	-	NCI	11895917
TP53	ALPELISIB	-	CKB	27659046
TP53	DASATINIB	-	CKB	26855149
TP53	TRIFLURIDINE	-	CKB	25700705
TP53	ALVESPIMYCIN	-	CKB	26009011
TP53	CYTARABINE	-	CKB	-
TP53	CHEMBL1221512	-	NCI	16224182
TP53	AZD-1775	-	CKB CGI	27601554 27196784 21992793 23520471 21389100 19887545 21799033 28652249 22713237 27998224
TP53	CETUXIMAB	-	CIViC	24957073
TP53	RG-7602	-	CKB	27815358
TP53	TIRAPAZAMINE	-	NCI	9647614
TP53	LY-3009120	-	CKB	26343583
TP53	PROXYPHYLLINE	-	NCI	16751417
TP53	DIETHYLSTILBESTROL	-	NCI	15545218
TP53	AZD-6738	-	CKB CGI	26563132 28062704
TP53	Lesogaberan	-	DrugBank	-
TP53	GEDATOUSIB	-	CKB	23980093 21325073
TP53	PRAMLINTIDE	-	CGI	-
TP53	DAUNORUBICIN	-	CKB	16243804
TP53	THIOTEPA	-	NCI	12058967
TP53	PUROMYCIN	-	NCI	11866936
TP53	VESNARINONE	-	NCI	7750082
TP53	AZD-7762	-	CKB	23839309
TP53	ZINC CHLORIDE	-	NCI	16585387
TP53	TRIFLUOPERAZINE	-	NCI	12415616
TP53	CHEMBL1235116	-	DrugBank	10592235
TP53	IFOSFAMIDE	-	CKB	23165797
TP53	PEMBROLIZUMAB	-	CKB	28039262
TP53	MYCOPHENOLIC ACID	-	NCI	16684279
TP53	PIMASERTIB	-	CKB	26228206
TP53	CAPECITABINE	-	CIViC	24957073
TP53	TAMOXIFEN	-	CIViC	10786679
TP53	VORINOSTAT	-	CKB	26009011 25669829
TP53	TARENFLURBIL	-	NCI	15710360
TP53	OXALIPLATIN	-	CKB CIViC	24957073 21468686
TP53	DABRAFENIB	-	CKB	27659046
TP53	INK-128	-	CKB	26272063 25261369
TP53	ERLOTINIB	-	CKB	27659046
TP53	GEMCITABINE	-	CKB CGI	27167172 23520471 21389100 27815358 26228206
TP53	YONDELIS	-	NCI	16888811
TP53	FLUOROURACIL	-	PharmGKB	-
TP53	HEMICHOLINIUM-3	-	CKB	21980130
TP53	DEMCIZUMAB	-	CKB	26855149
TP53	PRODIGIOSIN	-	CKB	26759239
TP53	DOXORUBICIN	-	CKB CGI CIViC	25658463 21399868 16243804 23165797 26826118 22698404 19569050
TP53	ABEMACICLIB	-	CKB CGI	27217383
TP53	AZD-6482	-	CKB	26563132
TP53	SELUMETINIB	-	CKB CIViC	26343583 26272063 22425996
TP53	GARLIC	-	NCI	16351512
TP53	ENCORAFENIB	-	CKB	-
TP53	PF-0047736	-	CKB	22713237
TP53	PHA-680632	-	CKB	18026198
TP53	INOSITOL	-	NCI	16733561
TP53	IBRUTINIB	-	CKB	26563132
TP53	TEMOZOLOMIDE	-	CKB	21730979
TP53	MITOMYCIN	-	CGI	-
TP53	GOSSYPOL	-	NCI	16020667
TP53	CRIZOTINIB	-	CKB	25971938 27149990 26438783
TP53	CHEMBL376408	-	CKB	21468686
TP53	NUTLIN-3	-	CKB	25964101 26494859 26883273
TP53	CHEMBL392068	-	CKB	26855149
TP53	TANESPIMYCIN	-	CKB	26009011
TP53	DACTOLISIB	-	CKB	26272063
COL18A1	ASCORBATE	-	NCI	12792883
COL18A1	THROMBIN	-	NCI	15615851
COL18A1	ANTAZOLINE HYDROCHLORIDE	-	NCI	15181823
COL18A1	VITAMIN E	-	NCI	12792883
COL18A1	TAMOXIFEN	-	NCI	16651433
COL18A1	BEVACIZUMAB	-	PharmGKB	-
COL18A1	ASPIRIN	-	NCI	11353854
COL18A1	PEMETREXED DISODIUM	-	PharmGKB	-
COL18A1	COLLAGENASE CLOSTRIDIUM HISTOLYTICUM	-	ChEMBLInteractions	-
COL18A1	HYDROGEN PEROXIDE	-	NCI	12832291
COL18A1	GLUTAMINE	-	NCI	16572858
COL18A1	CELECOXIB	-	NCI	12232050
COL18A1	CAMPTOTHECIN	-	NCI	15069724
COL18A1	OCRIPLASMIN	-	ChEMBLInteractions	-
CPD	CHEMBL560871	-	DrugBank	10592235 17139284 17016423
CYP2D6	GLUTETHIMIDE	inducer	TTD	-
CYP2D6	CODEINE	-	PharmGKB FDA	-
CYP2D6	FLUPENTIXOL	-	PharmGKB	-
CYP2D6	SPARTEINE	-	PharmGKB	-
CYP2D6	FLUVOXAMINE	-	FDA	-
CYP2D6	ALBUMIN HUMAN	-	NCI	11246175
CYP2D6	HYDROXYCHLOROQUINE	-	NCI	10848718
CYP2D6	PROPRANOLOL	-	PharmGKB FDA	-
CYP2D6	CLOZAPINE	-	PharmGKB FDA	-
CYP2D6	PAROXETINE	-	PharmGKB FDA	-
CYP2D6	ACETAMINOPHEN	-	PharmGKB	-
CYP2D6	ARFORMOTEROL	-	FDA	-
CYP2D6	ATOMOXETINE	-	PharmGKB FDA	-
CYP2D6	GINGKO	-	NCI	17611934
CYP2D6	HYPERICIN	-	NCI	15100173
CYP2D6	CHLORPROMAZINE	-	PharmGKB	-
CYP2D6	DOXEPIIN	-	PharmGKB FDA	-
CYP2D6	VALBENZAZINE	-	FDA	-
CYP2D6	PALONOSETRON	-	FDA	-

Gene	Drug	Interaction_types	Sources	PMIDs
CYP2D6	RISPERIDONE	-	PharmGKB FDA	-
CYP2D6	MIANSERIN	-	PharmGKB	-
CYP2D6	FESOTERODINE	-	FDA	-
CYP2D6	DARIFENACIN	-	FDA	-
CYP2D6	NEFAZODONE	-	FDA	-
CYP2D6	GALANTAMINE	-	PharmGKB FDA	-
CYP2D6	PERPHENAZINE	-	PharmGKB FDA	-
CYP2D6	DESIPRAMINE	-	PharmGKB FDA	-
CYP2D6	LOPERIDONE	-	PharmGKB FDA	-
CYP2D6	VENLAFAXINE	-	PharmGKB FDA	-
CYP2D6	ERLOTINIB	-	NCI	17575239
CYP2D6	METOPROLOL	-	FDA	-
CYP2D6	NEBIVOLOL	-	FDA	-
CYP2D6	GEFITINIB	-	PharmGKB	-
CYP2D6	THIORIDAZINE	-	FDA	-
CYP2D6	DEBRSOQUIN	-	PharmGKB	-
CYP2D6	DULOXETINE	-	FDA	-
CYP2D6	YOHIMBINE	-	PharmGKB	-
CYP2D6	CELECOXIB	-	PharmGKB	-
CYP2D6	CARVEDILOL	-	PharmGKB FDA	-
CYP2D6	TRAMADOL	-	FDA	-
CYP2D6	DEXTROMETHORPHAN	-	PharmGKB FDA	-
CYP2D6	FLUOXETINE	-	PharmGKB FDA	-
CYP2D6	MIRTAZAPINE	-	PharmGKB	-
CYP2D6	ESCITALOPRAM	-	FDA	-
CYP2D6	OLANZAPINE	-	PharmGKB	-
CYP2D6	PIMOZIDE	-	PharmGKB FDA	-
CYP2D6	TACROLIMUS	-	NCI	17202802
CYP2D6	FLIBANSERIN	-	FDA	-
CYP2D6	TOLTERODINE	-	PharmGKB FDA	-
CYP2D6	GARLIC	-	NCI	15974642
CYP2D6	MODAFINIL	-	PharmGKB NCI FDA	10820139
CYP2D6	METHYLPHENIDATE	-	NCI	10831022
CYP2D6	PERHEXILINE	-	PharmGKB	-
CYP2D6	IMIPRAMINE	-	FDA	-
CYP2D6	TRIMIPRAMINE	-	PharmGKB FDA	-
CYP2D6	CITALOPRAM	-	FDA	-
CYP2D6	ARIPIPIRAZOLE	-	PharmGKB FDA	-
CYP2D6	TERBINAFINE	-	PharmGKB	-
CYP2D6	AMPHETAMINE	-	NCI	9264312
CYP2D6	TETRABENAZINE	-	PharmGKB FDA	-
CYP2D6	STREPTOZOTOCIN	-	NCI	6305526
CYP2D6	PROTRIPTYLINE	-	PharmGKB FDA	-
CYP2D6	ELIGLUSTAT	-	FDA	-
CYP2D6	PROPAFENONE	-	FDA	-
CYP2D6	PALIPERIDONE	-	DrugBank	15767244
CYP2D6	NORTRIPTYLINE	-	PharmGKB FDA	-
CYP2D6	TIOTROPIUM BROMIDE	-	PharmGKB	-
CYP2D6	DESLOMATADINE	-	PharmGKB	-
CYP2D6	VORICONAZOLE	-	NCI	16141569
CYP2D6	FLECAINIDE	-	PharmGKB	-
CYP2D6	MEXILETINE	-	PharmGKB NCI	9806111
CYP2D6	ONDANSETRON	-	FDA	-
CYP2D6	CLOMIPRAMINE	-	PharmGKB FDA	-
CYP2D6	MAPROTIline	-	PharmGKB	-
CYP2D6	CORTICOTROPIN	-	NCI	12571407
CYP2D6	VORTIOXETINE	-	FDA	-
CYP2D6	CEVIMELINE	-	FDA	-
CYP2D6	RUCAPARIB	-	FDA	-
CYP2D6	ZUCLOPENTHIXOL	-	PharmGKB	-
CYP2D6	QUININE SULFATE	-	FDA	-
CYP2D6	AMITRIPTYLINE	-	FDA	-
CYP2D6	BREXPIPIRAZOLE	-	FDA	-
NOTCH1	REGN-421	antibody	MyCancerGenome	-
NOTCH1	NIROGACESTAT	inhibitor	MyCancerGenome CKB	26202948 25564152 23868008
NOTCH1	PACLITAXEL	-	CKB	25104330
NOTCH1	PREDNISOLONE	-	CKB	28151717
NOTCH1	BORTEZOMIB	-	CKB	28151717
NOTCH1	HYDROCORTISONE	-	NCI	11948681
NOTCH1	MERCAPTOPURINE	-	CKB	28151717
NOTCH1	EVEROLIMUS	-	CKB	28151717
NOTCH1	ASPARAGINASE	-	CKB	28151717
NOTCH1	METHOTREXATE	-	CKB	28151717
NOTCH1	TEMOZOLOMIDE	-	CKB	27154916
NOTCH1	DEKAMETHASONE	-	CKB	28151717
NOTCH1	Ribociclib	-	CKB	28151717
NOTCH1	DOCETAXEL	-	CKB	26202948
NOTCH1	BRONITICUZUMAB	-	CKB	23774673
HCAR1	NIACIN	agonist	GuideToPharmacologyIntera	-
HCAR1	3,5-DIHYDROXYBENZOIC ACID	agonist	GuideToPharmacologyIntera	-
HCAR1	AMSACRINE	agonist	GuideToPharmacologyIntera	-
HCAR1	L-LACTIC ACID	agonist	GuideToPharmacologyIntera	-
HCAR1	D-LACTIC ACID	agonist	GuideToPharmacologyIntera	-
XRCC1	FLUOROURACIL	-	PharmGKB	-
XRCC1	DOCETAXEL	-	CIViC	19157633
XRCC1	VINORELBINE BASE	-	CIViC	19157633
XRCC1	VITAMIN E	-	NCI	12618330
XRCC1	GEMCITABINE	-	CIViC	19157633
XRCC1	OXALIPLATIN	-	PharmGKB	-
XRCC1	PHENYLTHIOUREA	-	PharmGKB	-
XRCC1	CARBOPLATIN	-	PharmGKB CIViC	16875718
PIK3CD	RG-7666	inhibitor	ChEMBLInteractions	-
PIK3CD	PF-04691502	inhibitor	MyCancerGenome ChEMBL	-
PIK3CD	RECLISIB	inhibitor	ChEMBLInteractions	-
PIK3CD	PA-799	inhibitor	GuideToPharmacologyIntera	-
PIK3CD	ALPELISIB	inhibitor	MyCancerGenome GuideTo	-
PIK3CD	AMG-319	inhibitor	GuideToPharmacologyIntera	-
PIK3CD	APITOLISIB	inhibitor	MyCancerGenome GuideTo	-
PIK3CD	AZD-6482	inhibitor	GuideToPharmacologyIntera	-

Gene	Drug	Interaction_types	Sources	PMIDs
PIK3CD	AZD-8186	inhibitor	GuideToPharmacologyIntera	
PIK3CD	CANDICIDIN	inhibitor	GuideToPharmacologyIntera	
PIK3CD	CUDC-907	inhibitor	GuideToPharmacologyIntera	
PIK3CD	DACTOLISIB	inhibitor	MyCancerGenome GuideTo	
PIK3CD	DUVELSIB	inhibitor	GuideToPharmacologyIntera	
PIK3CD	PHENMETRAZINE	inhibitor	GuideToPharmacologyIntera	
PIK3CD	IDELALISIB	inhibitor	MyCancerGenome TdgClinic	
PIK3CD	INK-128	inhibitor	GuideToPharmacologyIntera	
PIK3CD	OXAZEPAM	inhibitor	GuideToPharmacologyIntera	
PIK3CD	CHEMBL1086377	inhibitor	GuideToPharmacologyIntera	
PIK3CD	LY-294002	inhibitor	GuideToPharmacologyIntera	
PIK3CD	LY-3023414	inhibitor	GuideToPharmacologyIntera	
PIK3CD	OMIPALISIB	inhibitor	ClarityFoundationClinicalTr	
PIK3CD	PI-103	inhibitor	MyCancerGenome GuideTo	
PIK3CD	CHEMBL568150	inhibitor	GuideToPharmacologyIntera	
PIK3CD	PICTULISIB	inhibitor	MyCancerGenome GuideTo	
PIK3CD	PILARALISIB (CHEMBL3360203)	inhibitor	GuideToPharmacologyIntera	
PIK3CD	CHEMBL1081312	inhibitor	GuideToPharmacologyIntera	
PIK3CD	YOHIMBINE	inhibitor	GuideToPharmacologyIntera	
PIK3CD	TASELSIB	inhibitor	GuideToPharmacologyIntera	
PIK3CD	TG100-115	inhibitor	GuideToPharmacologyIntera	
PIK3CD	VS-5584	inhibitor	GuideToPharmacologyIntera	
PIK3CD	ZSTK-474	inhibitor	ClarityFoundationClinicalTr	
PIK3CD	DS-7423	inhibitor	ChembllInteractions	-
PIK3CD	GSK-1059615	inhibitor	ChembllInteractions	-
PIK3CD	RP-6530	inhibitor	ChembllInteractions	-
PIK3CD	TGR-1202	inhibitor	ChembllInteractions	-
PIK3CD	WX-037	inhibitor	ChembllInteractions	-
PIK3CD	INCB-040093	inhibitor	ChembllInteractions	-
PIK3CD	Puquritinib	inhibitor	ChembllInteractions	-
PIK3CD	COPANLISIB	inhibitor	MyCancerGenome Chembll	-
PIK3CD	Acalisib	inhibitor	ChembllInteractions	-
PIK3CD	GEDATOLISIB	inhibitor	MyCancerGenome Chembll	-
PIK3CD	SONOLISIB	inhibitor	MyCancerGenome Chembll	-
PIK3CD	VOXTALISIB	inhibitor	MyCancerGenome TdgClinic	-
PIK3CD	GSK-2269557	inhibitor	ChembllInteractions	-
PIK3CD	SF-1126	inhibitor	MyCancerGenome TdgClinic	-
PIK3CD	QUERCETIN	inhibitor	MyCancerGenome	-
PIK3CD	PILARALISIB (CHEMBL3218575)	inhibitor	MyCancerGenome Clarityf	-
PIK3CD	CAL-263	inhibitor	ChembllInteractions	-
PIK3CD	BGT-226 (CHEMBL3545096)	inhibitor	ChembllInteractions	-
PIK3CD	BUPARLISIB	inhibitor	MyCancerGenome Clarityf	-
PIK3CD	GSK-2636771	inhibitor	MyCancerGenome	-
PIK3CD	Panulisib	inhibitor	ChembllInteractions	-
PIK3CD	PWT-33587	inhibitor	ChembllInteractions	-
PIK3CD	INCB-40093	inhibitor	ChembllInteractions	-
PIK3CD	ME-401	inhibitor	ChembllInteractions	-
PIK3CD	BUPARLISIB HYDROCHLORIDE	inhibitor	MyCancerGenomeClinicalTri	-
PIK3CD	RIGOSERTIB	-	TdgClinicalTrial	-
PIK3CD	CHEMBL1213083	-	DrugBank	12113647
MTOR	PIMECROLIMUS	potentiator	TdgClinicalTrial DrugBank	10592235
MTOR	SIROUMUS	inhibitor	TALC MyCancerGenome Td	26619011 24631838 12742462 20005306 27482884 27279227 11752352 19620795
MTOR	AZD-8055	inhibitor	TALC MyCancerGenome Gu	27279227
MTOR	EVEROLIMUS	inhibitor	TALC MyCancerGenome Td	26859683 19344392 20531964 27482884 19774211 11010 20155724 18466433 24625776 11752352 20569080 24622468 25295501 2015
MTOR	TEMSIROLIMUS	inhibitor	TALC MyCancerGenome Td	27482884 17935273 11752352 18265991
MTOR	APITOLISIB	inhibitor	MyCancerGenome GuideTo	
MTOR	CC-223	inhibitor	GuideToPharmacologyIntera	
MTOR	PA-799	inhibitor	GuideToPharmacologyIntera	
MTOR	DACTOLISIB	inhibitor	TALC MyCancerGenome Gu	
MTOR	GEDATOLISIB	inhibitor	MyCancerGenome GuideTo	
MTOR	INK-128	inhibitor	MyCancerGenome GuideTo	
MTOR	METFORMIN	inhibitor	GuideToPharmacologyIntera	
MTOR	LY-3023414	inhibitor	GuideToPharmacologyIntera	
MTOR	OMIPALISIB	inhibitor	GuideToPharmacologyIntera	
MTOR	PF-04691502	inhibitor	TALC MyCancerGenome Gu	
MTOR	PI-103	inhibitor	MyCancerGenome GuideTo	
MTOR	CHEMBL1081312	inhibitor	GuideToPharmacologyIntera	
MTOR	SPARFLOXACIN	inhibitor	GuideToPharmacologyIntera	
MTOR	RIDAFOROLIMUS	inhibitor	TALC MyCancerGenome Td	
MTOR	YOHIMBINE	inhibitor	GuideToPharmacologyIntera	
MTOR	TORIN1	inhibitor	GuideToPharmacologyIntera	
MTOR	BENZONATATE	inhibitor	GuideToPharmacologyIntera	
MTOR	VS-5584	inhibitor	GuideToPharmacologyIntera	
MTOR	CHEMBL561708	inhibitor	GuideToPharmacologyIntera	
MTOR	VOXTALISIB	inhibitor	TALC MyCancerGenome Td	
MTOR	OSI-027	inhibitor	TALC MyCancerGenome Td	
MTOR	ALPELSIB	inhibitor	CancerCommons	
MTOR	SF-1126	inhibitor	MyCancerGenome TdgClinic	
MTOR	DS-3078a	inhibitor	ChembllInteractions Cancere	
MTOR	Panulisib	inhibitor	ChembllInteractions	
MTOR	Palomid-529	inhibitor	TdgClinicalTrial ChembllInte	
MTOR	PKI-179	inhibitor	ChembllInteractions	
MTOR	RG-7603	inhibitor	ChembllInteractions	
MTOR	AZD-2014	inhibitor	ChembllInteractions	
MTOR	PWT-33579	inhibitor	ChembllInteractions	
MTOR	CC-115	inhibitor	ChembllInteractions	
MTOR	BGT-226 (CHEMBL3545096)	inhibitor	ChembllInteractions	
MTOR	MLN-0128	inhibitor	ChembllInteractions	
MTOR	DS-7423	inhibitor	ChembllInteractions	
MTOR	PWT-33587	inhibitor	ChembllInteractions	
MTOR	AZD-5363	-	CIViC	26490311
MTOR	LY-294002	-	CIViC	26490311
MTOR	CHEMBL269259	-	DrugBank	
MTOR	PAZOPANIB	-	CIViC	24625776
BAZ2B	GEMCITABINE	-	PharmGKB	
NMNAT3	BETANMIN	-	DrugBank	17139284 17016423

Gene	Drug	Interaction_types	Sources	PMIDs
NMNA3	DIPHOSPHOMETHYLPHOSPHONIC ACID ADENOSYL ESTER	-	DrugBank	17139284 17016423
EPHA5	VANDETANIB	inhibitor	ChEMBLInteractions	-
GABRG2	ZALEPLON	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	Loretiaplon	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	TEMAZEPAM	potentiator positive allosteric modulator	ChEMBLInteractions TEND	18384456 20138190
GABRG2	ADINAZOLAM	potentiator	TEND DrugBank	6148400 6320036
GABRG2	HALAZEPAM	potentiator positive allosteric modulator	ChEMBLInteractions TEND	6738302 2867566
GABRG2	DIAZEPAM	potentiator positive allosteric modulator	ChEMBLInteractions TEND	18384456 11752090
GABRG2	OXAZEPAM	potentiator positive allosteric modulator	ChEMBLInteractions TEND	18384456 11752090
GABRG2	TRIAZOLAM	potentiator positive allosteric modulator	ChEMBLInteractions TEND	18384456 11752090
GABRG2	FLUMAZENIL	antagonist	ChEMBLInteractions DrugBa	17974564 8693922 11864636
GABRG2	ESTAZOLAM	potentiator positive allosteric modulator	ChEMBLInteractions TEND	639854 2889803
GABRG2	GINKGO	negative modulator	DrugBank	12824018
GABRG2	BROMAZEPAM	potentiator	TEND DrugBank	18384456
GABRG2	CLOTIAZEPAM	potentiator	TEND DrugBank	18855614 10592235 18604239
GABRG2	FLUDIAZEPAM	potentiator	TEND DrugBank	2857046
GABRG2	PRAZEPAM	potentiator positive allosteric modulator	ChEMBLInteractions TEND	7773620
GABRG2	QUAZEPAM	potentiator positive allosteric modulator	ChEMBLInteractions TEND	3017690 2892106
GABRG2	CINOLAZEPAM	potentiator	TEND DrugBank	7849137
GABRG2	NITRAZEPAM	potentiator	TEND DrugBank	18384456 11752090
GABRG2	CLOBAZAM	positive allosteric modulator	ChEMBLInteractions TEND	-
GABRG2	CLOAZEPATE DIPOTASSIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	CHLORDIAZEPOXIDE	positive allosteric modulator	ChEMBLInteractions TEND	-
GABRG2	CHLORDIAZEPOXIDE HYDROCHLORIDE	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	MEPROBAMATE	agonist	ChEMBLInteractions	-
GABRG2	ALPRAZOLAM	positive allosteric modulator	ChEMBLInteractions TEND	-
GABRG2	BUTALBITAL	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	CLONAZEPAM	positive allosteric modulator	ChEMBLInteractions TEND	-
GABRG2	DESFLURANE	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	TALBUTAL	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	LORAZEPAM	positive allosteric modulator	ChEMBLInteractions TEND	-
GABRG2	METHARBITAL	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	METHOHEXITAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	METHYRYLON	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	PROPOFOL	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	PENTOBARBITAL	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	PENTOBARBITAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	SEVOFLURANE	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	THIAMYLAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	THIOPENTAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	HALOTHANE	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	ZOLPIDEM TARTRATE	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	ADIPLON	partial agonist	ChEMBLInteractions	-
GABRG2	PF-06372865	agonist	ChEMBLInteractions	-
GABRG2	BUTABARBITAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	MIDAZOLAM HYDROCHLORIDE	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	SECOBARBITAL SODIUM	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	PRIMIDONE	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	FLURAZEPAM HYDROCHLORIDE	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	ISOFLURANE	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	ESZOPICLONE	positive allosteric modulator	ChEMBLInteractions	-
GABRG2	RESEQUINIL	inverse agonist	ChEMBLInteractions	-
GABRG2	GLUTETHIMIDE	-	ChEMBLInteractions	-
GABRG2	CLOAZEPIC ACID	-	TEND	-
GABRG2	METHOXYFLURANE	-	ChEMBLInteractions	-
GABRG2	ENFLURANE	-	ChEMBLInteractions	-
GABRG2	ACAMPROSATE CALCIUM	-	ChEMBLInteractions	-
GABRG2	ETHCHLORVYNOL	-	ChEMBLInteractions	-
GABRG2	TOPIRAMATE	-	ChEMBLInteractions	-
GABRG2	TRICLOFOS SODIUM	-	ChEMBLInteractions	-
GABRG2	MIDAZOLAM	-	TEND	-
GABRG2	ETOMIDATE	-	ChEMBLInteractions	-
GABRG2	FLURAZEPAM	-	TEND	-
WRN	UREA	-	NCI	17312972
WRN	CAMPOTHECIN	-	NCI	17303082
WRN	BLEOMYCIN (CHEMBL3039590)	-	NCI	15149862
GRIN3A	GW468816	antagonist	ChEMBLInteractions	-
GRIN3A	ORPHENADRINE (CHLORIDE)	antagonist	ChEMBLInteractions	-
GRIN3A	METHADONE	antagonist	DrugBank	19717013 17139284 17016423
GRIN3A	ETHOPROPAZINE	antagonist	DrugBank	2849655 12681372 17139284 17016423
GRIN3A	PROCAINE	antagonist	DrugBank	11812692 17139284 17016423 16299047
GRIN3A	AMANTADINE HYDROCHLORIDE	antagonist	ChEMBLInteractions DrugBa	10443547 15800186
GRIN3A	FELBAMATE	antagonist	TdgClinicalTrial ChEMBLInte	17139284 17016423
GRIN3A	HALOTHANE	antagonist	DrugBank	8968191
GRIN3A	TENOXYCLIDINE	antagonist	DrugBank	17157509 2538766
GRIN3A	PHENCYCLIDINE	antagonist	DrugBank	17139284 17016423
GRIN3A	ACETYLCYSTEINE	activator	DrugBank	12183209
GRIN3A	AZD8108	antagonist	ChEMBLInteractions	-
GRIN3A	NRX-1074	partial agonist	ChEMBLInteractions	-
GRIN3A	RAPASTINEL	partial agonist	ChEMBLInteractions	-
GRIN3A	CNS-5161	blocker	TdgClinicalTrial ChEMBLInte	-
GRIN3A	Indantadol	antagonist	TdgClinicalTrial ChEMBLInte	-
GRIN3A	RALFINAMIDE	antagonist	ChEMBLInteractions	-
GRIN3A	NERAMEXANE MESYLATE	antagonist	ChEMBLInteractions	-
GRIN3A	NEBOGLAMINE	positive allosteric modulator	ChEMBLInteractions	-
GRIN3A	ACAMPROSATE CALCIUM	antagonist	ChEMBLInteractions	-
GRIN3A	AV-101	antagonist	ChEMBLInteractions	-
GRIN3A	ORPHENADRINE CITRATE	antagonist	ChEMBLInteractions	-
GRIN3A	LANICEMINE	blocker	TdgClinicalTrial ChEMBLInte	-
GRIN3A	DELUCEMINE	antagonist	ChEMBLInteractions	-
GRIN3A	CHEMBL334533	-	TdgClinicalTrial	-
GRIN3A	MEMANTINE	-	TdgClinicalTrial TEND	-
GRIN3A	ESKETAMINE HYDROCHLORIDE	-	ChEMBLInteractions	-
GRIN3A	LATREPIRIDINE	-	TdgClinicalTrial	-
GRIN3A	KETAMINE	-	TdgClinicalTrial TEND	-
GRIN3A	DEXTROMETHORPHAN	-	TdgClinicalTrial TEND	-
GRIN3A	KETAMINE HYDROCHLORIDE	-	ChEMBLInteractions	-
GRIN3A	ESKETAMINE	-	ChEMBLInteractions	-
GRIN3A	ORPHENADRINE	-	TdgClinicalTrial TEND	-

Gene	Drug	Interaction_types	Sources	PMIDs
GRIN3A	MEMANTINE HYDROCHLORIDE	-	ChemblInteractions	-
GRIN3A	L-GLUTAMATE	-	DrugBank	17139284 17016423
GRIN3A	ACAMPROSATE	-	TdgClinicalTrial	-
GRIN3A	NERAMEXANE	-	TdgClinicalTrial DrugBank	-
GRIN3A	ROLICYCLIDINE	-	DrugBank	20613880 20641908
CUBN	HYDROXOCOBALAMIN	other	DrugBank	14585166 17139284 17016423
NRP1	PALIFERMIN	-	TdgClinicalTrial DrugBank	9890894 10821861 9094999
NRP1	PEGAPTANIB OCTASODIUM	-	TEND	-
XPNPEP1	TOSEDOSTAT	inhibitor	ChemblInteractions	-
GANC	MIGLITOL	antagonist	DrugBank	19085811 19818342
EPRS	L-GLUTAMATE	-	DrugBank	17139284 17016423 9063462 8132637
EPRS	L-PROLINE	-	DrugBank	17139284 17016423
EPRS	HALOFUGINONE	-	TdgClinicalTrial	-
EPRS	CHEMBL1163074	-	DrugBank	10592235 17139284 17016423
KCNJ2	DRONEDARONE HYDROCHLORIDE	blocker	ChemblInteractions	-
ISYNA1	GLYCERIN	-	DrugBank	10592235 17139284 17016423
KCNQ5	FLINDOKALNER	activator	GuideToPharmacologyIntera	-
KCNQ5	EZOAGABINE	activator blocker	TdgClinicalTrial GuideToPha	16713428 12545144 17184917
KCNQ5	CHEMBL317935	activator	GuideToPharmacologyIntera	-
KCNQ5	LINOPIRDINE	channel blocker	GuideToPharmacologyIntera	-
KCNQ5	CHEMBL342375	channel blocker	GuideToPharmacologyIntera	-
KCNQ5	DALFAMPRIDINE	blocker	ChemblInteractions	-
KCNQ5	GUANIDINE HYDROCHLORIDE	blocker	ChemblInteractions	-
KCNQ5	TEDISAMIL	blocker	ChemblInteractions	-
KCNQ5	NERISPIRIDINE	blocker	ChemblInteractions	-
KCNQ5	CELECOXIB	-	PharmGKB	-
SLC9A3	TENAPANOR HYDROCHLORIDE	inhibitor	ChemblInteractions	-
SLC9A3	SQUALAMINE LACTATE	inhibitor	ChemblInteractions	-
SLC9A3	ALBUMIN HUMAN	-	NCI	11251045 11698229
XPO1	SELINEXOR	inhibitor	ChemblInteractions	-
EPHB3	VANDETANIB	inhibitor	ChemblInteractions	-
NPY1R	CHEMBL422942	antagonist	TTD	-
NPY1R	CHEMBL435278	-	DrugBank	-
VCAN	HYALURONIC ACID	binder	DrugBank	2466833 2469524
VCAN	CYCLOSPORINE	-	NCI	14974815
TBP	TRETINOIN	-	NCI	8413615
TBP	ETOPOSIDE	-	NCI	1646402
TRPM6	CHEMBL169233	activator	GuideToPharmacologyIntera	-
TRPM6	MAGNESIUM	activator channel blocker	GuideToPharmacologyIntera	-
TRPM6	GADOBENATE DIMEGLUMINE	activator	GuideToPharmacologyIntera	-
TRPM6	RUTHENIUM RED	channel blocker	GuideToPharmacologyIntera	-
TRPM6	ca2	channel blocker	GuideToPharmacologyIntera	-
DRD4	LOXAPINE HYDROCHLORIDE	antagonist	ChemblInteractions	-
DRD4	SARIZOTAN HYDROCHLORIDE	agonist	ChemblInteractions	-
DRD4	AMOXAPINE	antagonist	ChemblInteractions DrugBa	16135699
DRD4	APOMORPHINE	agonist	TdgClinicalTrial GuideToPha	17067298 18691132 17164075 15007532 9871530 11752352 9497025
DRD4	CABERGOLINE	agonist	GuideToPharmacologyIntera	12388667 18691132
DRD4	LISURIDE	agonist	GuideToPharmacologyIntera	18691132
DRD4	PERGLIDE	agonist	GuideToPharmacologyIntera	-
DRD4	ROXINDOLE	agonist	GuideToPharmacologyIntera	-
DRD4	BENPERIDOL	antagonist	GuideToPharmacologyIntera	-
DRD4	BROMOCRIPTINE	antagonist	GuideToPharmacologyIntera	-
DRD4	ARIPIPRAZOLE	partial agonist antagonist	DrugBank	17848919
DRD4	ROPINIROLE	agonist	TdgClinicalTrial DrugBank	18691132 11752352
DRD4	OLANZAPINE	antagonist	TdgClinicalTrial ChemblInte	11752352 16237394
DRD4	CLOZAPINE	antagonist	TdgClinicalTrial GuideToPha	15886414 13129658 15992586 16223700 11752352 12763097
DRD4	THIETHYLPRAZINE	antagonist	TdgClinicalTrial TEND DrugB	17139284 17016423
DRD4	LOXAPINE	binder antagonist	GuideToPharmacologyIntera	-
DRD4	REMOXIPRIDE	antagonist	DrugBank	9015795
DRD4	PROMAZINE	antagonist	TdgClinicalTrial TEND DrugB	17139284 17016423
DRD4	RISPERIDONE	antagonist	DrugBank	7520908 7531353
DRD4	PROPIOMAZINE	antagonist	TdgClinicalTrial TEND DrugB	17139284 17016423
DRD4	LEVODOPA	agonist	TdgClinicalTrial DrugBank	11978145 18549347 9633680
DRD4	ROTIHOTINE	agonist	TdgClinicalTrial GuideToPha	18691132
DRD4	CHEMBL219182	agonist	GuideToPharmacologyIntera	-
DRD4	DOPAMINE	agonist	GuideToPharmacologyIntera	-
DRD4	FENOLDOPAM	agonist	GuideToPharmacologyIntera	-
DRD4	QUINPIROLE	agonist	GuideToPharmacologyIntera	-
DRD4	CHEMBL1255588	antagonist	GuideToPharmacologyIntera	-
DRD4	CHLORPROMAZINE	antagonist	GuideToPharmacologyIntera	-
DRD4	ETICLOPRIDE	antagonist	GuideToPharmacologyIntera	-
DRD4	HALOPERIDOL	antagonist inverse agonist	GuideToPharmacologyIntera	-
DRD4	CHEMBL444309	antagonist	GuideToPharmacologyIntera	-
DRD4	CHEMBL25918	antagonist	GuideToPharmacologyIntera	-
DRD4	NEMONAPRIDE	antagonist	GuideToPharmacologyIntera	-
DRD4	PEROSPIRONE	antagonist	GuideToPharmacologyIntera	-
DRD4	PIRIBEDIL (CHEMBL1371770)	antagonist	GuideToPharmacologyIntera	-
DRD4	PROCHLORPERAZINE	antagonist	GuideToPharmacologyIntera	-
DRD4	SERTINDOLE	antagonist	GuideToPharmacologyIntera	-
DRD4	SONEPIPRAZOLE	antagonist binder	GuideToPharmacologyIntera	-
DRD4	SPIPERONE	antagonist	GuideToPharmacologyIntera	-
DRD4	SULPIRIDE	antagonist	GuideToPharmacologyIntera	-
DRD4	CHEMBL196677	antagonist	GuideToPharmacologyIntera	-
DRD4	CHEMBL103772	antagonist	GuideToPharmacologyIntera	-
DRD4	TERGURIDE	antagonist	GuideToPharmacologyIntera	-
DRD4	TRIFLUOPERAZINE	antagonist	GuideToPharmacologyIntera	-
DRD4	CHEMBL64119	antagonist	GuideToPharmacologyIntera	-
DRD4	ZOTEPINE	antagonist	GuideToPharmacologyIntera	-
DRD4	PALIPERIDONE	antagonist	DrugBank	7520908 7531353
DRD4	LEVOMEPRIMAZINE	antagonist	ChemblInteractions DrugBa	15701205
DRD4	FLIBANSERIN	antagonist	DrugBank	26412054 12890707 12177684
DRD4	ILOPERIDONE	antagonist	DrugBank	23272794
DRD4	BROMOCRIPTINE MESYLATE	agonist	ChemblInteractions	-
DRD4	CHLORPROMAZINE HYDROCHLORIDE	antagonist	ChemblInteractions	-
DRD4	OLANZAPINE PAMOATE	antagonist	ChemblInteractions	-
DRD4	PRAMIPEXOLE DIHYDROCHLORIDE	agonist	ChemblInteractions	-
DRD4	LOXAPINE SUCCINATE	antagonist	ChemblInteractions	-

Gene	Drug	Interaction_types	Sources	PMIDs
DRD4	PROMAZINE HYDROCHLORIDE	antagonist	ChemblInteractions	-
DRD4	THIORIDAZINE HYDROCHLORIDE	antagonist	ChemblInteractions	-
DRD4	THIORIDAZINE	antagonist	ChemblInteractions	-
DRD4	APOMORPHINE HYDROCHLORIDE	agonist	ChemblInteractions	-
DRD4	TRIFLUOPERAZINE HYDROCHLORIDE	antagonist	ChemblInteractions	-
DRD4	DROPERIDOL	antagonist	ChemblInteractions	-
DRD4	BELAPERIDONE	antagonist	TTD	-
DRD4	TIANEPTINE	binder	TTD	-
DRD4	ROPINIROLE HYDROCHLORIDE	agonist	ChemblInteractions	-
DRD4	CHEMBL332154	antagonist	TTD	-
DRD4	SARIZOTAN	agonist	TTD	-
DRD4	HALOPERIDOL DECANOATE	inverse agonist	ChemblInteractions	-
DRD4	PALBOCICLUB	antagonist	TTD	-
DRD4	PERGOLIDE MESYLATE	agonist	ChemblInteractions	-
DRD4	PIMOZIDE	antagonist	ChemblInteractions	-
DRD4	HALOPERIDOL LACTATE	inverse agonist	ChemblInteractions	-
DRD4	ERGOLOID MESYLATES	agonist	ChemblInteractions	-
DRD4	ZICRONAPINE	-	TdgClinicalTrial	-
DRD4	DEXPRAMIPEXOLE	-	TdgClinicalTrial	-
DRD4	ZIPRASIDONE	-	TEND	-
DRD4	ETILEVODOPA	-	TdgClinicalTrial	-
DRD4	MELEVODOPA	-	TdgClinicalTrial	-
DRD4	PARDOPRUNOX HYDROCHLORIDE	-	DrugBank	-
DRD4	PARDOPRUNOX	-	TdgClinicalTrial	-
DRD4	ASENAPINE (CHEMBL3187365)	-	TdgClinicalTrial	-
DRD4	PRAMIPEXOLE	-	TdgClinicalTrial TEND	-
ITPR3	CA2	activator	GuideToPharmacologyIntera	-
ITPR3	INS(1,4,5)P3	activator	GuideToPharmacologyIntera	-
ITPR3	SODIUM ORTHOVANAD	antagonist	GuideToPharmacologyIntera	-
PMEL	HEXAMETHYLENEBISACETAMIDE	-	NCI	11310793
PSMA3	BORTEZOMIB	inhibitor	MyCancerGenome Chembl	-
PSMA3	CARFILZOMIB	inhibitor	MyCancerGenome Chembl	-
PSMA3	IXAZOMIB CITRATE	inhibitor	ChemblInteractions	-
PSMA3	OPROZOMIB	inhibitor	ChemblInteractions	-
PSMA3	MARIZOMIB	inhibitor	ChemblInteractions	-
NF1	TRAMETINIB	-	ClarityFoundationBiomarke	24576830 21245089 25243813 26936308 24583796 2524381
NF1	NILOTINIB	-	CGI	-
NF1	SELUMETINIB	-	ClarityFoundationBiomarke	28029918
NF1	EVEROLIMUS	-	CGI	26859683 11010 2016 17557 2015
NF1	PIMASERTIB	-	ClarityFoundationBiomarke	-
NF1	IMATINIB	-	CGI	-
NF1	BEVACIZUMAB	-	CGI	24232489 2485933
NF1	VINBLASTINE	-	CGI	-
NF1	COBIMETINIB	-	ClarityFoundationBiomarke	-
NF1	PLX-3397	-	OncoKB CGI	26925841 24718867
NF1	ERLOTINIB	-	CGI	-
NF1	CEDIRANIB	-	CGI	-
NF1	DASATINIB	-	CGI	-
NF1	PAZOPANIB	-	CGI	-
NF1	VENMURAFENIB	-	CGI CIVIC	23288408 231718
NF1	SORAFENIB	-	CGI	-
NF1	TAMOXIFEN	-	CGI	-
NF1	PD-0325901	-	ClarityFoundationBiomarke	23171796
NF1	BINIMETINIB	-	ClarityFoundationBiomarke	26925841 24718867
NF1	SIROLIMUS	-	CGI CIVIC	23171796
NF1	DABRAFENIB	-	CIVIC	23171796
NF1	TIPIFARNIB	-	CGI	-
CACNA1G	PREGABALIN	modulator	ChemblInteractions	-
CACNA1G	GABAPENTIN ENACARBIL	modulator	ChemblInteractions	-
CACNA1G	MIBEFRADIL DIHYDROCHLORIDE	blocker	ChemblInteractions	-
CACNA1G	TRIMETHADIONE	inhibitor blocker	TdgClinicalTrial ChemblInte	17291698 16171802 11752352 17139284 17016423
CACNA1G	CINNARIZINE	inhibitor	DrugBank	1281221 3530295
CACNA1G	ETHOSUXIMIDE	inhibitor blocker	TdgClinicalTrial ChemblInte	11752352 1174992 19005061 11641441
CACNA1G	VERAPAMIL	inhibitor	TEND DrugBank	16699084 19125880 11752352
CACNA1G	ZONISAMIDE	inhibitor	TdgClinicalTrial TEND DrugB	19557119 20001433 17762320 19948168 15511691 14965331 17139284 20025128 17016423 20502722 14704463 18433351
CACNA1G	ANANDAMIDE	channel blocker	GuideToPharmacologyIntera	-
CACNA1G	MIBEFRADIL	channel blocker inhibitor	GuideToPharmacologyIntera	9481612 10692398 11752352 9375939 1689990 15562257
CACNA1G	CHEMBL1684954	channel blocker	GuideToPharmacologyIntera	-
CACNA1G	FLUNARIZINE	inhibitor	TdgClinicalTrial TEND DrugB	19582593 11784784 17139284 17016423
CACNA1G	METHSUXIMIDE	inhibitor blocker	ChemblInteractions DrugBa	2545161 11274992 19005061 11641441
CACNA1G	BEPRIDIL HYDROCHLORIDE	blocker	ChemblInteractions	-
CACNA1G	GABAPENTIN	modulator	ChemblInteractions	-
CACNA1G	PHENSUXIMIDE	blocker	ChemblInteractions	-
CACNA1G	PARAMETHADIONE	blocker	ChemblInteractions	-
CACNA1G	ATAGABALIN	modulator	ChemblInteractions	-
CACNA1G	IMAGABALIN	modulator	ChemblInteractions	-
CACNA1G	CELECOXIB	-	PharmGKB	-
RAMP3	PRAMLINTIDE	agonist	TdgClinicalTrial GuideToPha	15494035 18593822 11772274 20357016 20015292 17139284 19273748 17016423
RAMP3	PRAMLINTIDE ACETATE	agonist	ChemblInteractions	-
RAMP3	ALCOHOL	agonist	GuideToPharmacologyIntera	-
RAMP3	MONOETHANOLAMINE	antagonist	GuideToPharmacologyIntera	-
RAMP3	AMYLIN	agonist	GuideToPharmacologyIntera	-
RAMP3	CALCITONIN	agonist	GuideToPharmacologyIntera	-
RAMP3	STREPTOZOTOCIN	-	NCI	14717924
MUC16	OREGOVOMAB	-	TdgClinicalTrial ChemblInte	17073521 15268682 9671143
MUC16	ABAGOVOMAB	-	TdgClinicalTrial ChemblInte	-
MUC16	SODIUM BUTYRATE	-	NCI	1720110 1645702
MUC16	TOPOTECAN	-	NCI	17227902
MUC16	TAMOXIFEN	-	NCI	10629663
MUC16	BUSERELIN ACETATE	-	NCI	1533376
MUC16	CYCLOSPORINE	-	NCI	12169874
MUC16	DOCETAXEL	-	NCI	9288793 14756546
MUC16	ETOPOSIDE	-	NCI	1988893
KCNH2	DOFETILIDE	inhibitor channel blocker blocker	PharmGKB TdgClinicalTrial	10648647 15548764 9486667 11732241 11166283 10712445 11752352 11698075
KCNH2	AMSACRINE	inhibitor	DrugBank	15148258
KCNH2	TERFENADINE	inhibitor channel blocker	PharmGKB GuideToPharma	15102940 11752352 20636881

Gene	Drug	Interaction_types	Sources	PMIDs
KCNH2	CISAPRIDE	inhibitor channel blocker	PharmGKB GuideToPharma	12209010 15967876 9374794 17408310 10510456
KCNH2	ASTEMIZOLE	inhibitor channel blocker	PharmGKB GuideToPharma	10376921 10422790 10444235 11575008 15272206
KCNH2	VERAPAMIL	inhibitor	DrugBank	15814090 19125880 15135665 15892662 17588331 16507347
KCNH2	PIMOZIDE	inhibitor	PharmGKB DrugBank	11377395 11511086 11296551 10762666
KCNH2	MICONAZOLE	inhibitor	DrugBank	15778703 8760033
KCNH2	CARVEDILOL	inhibitor	DrugBank	11164846 16314852
KCNH2	HALOFANTRINE	inhibitor	DrugBank	12176129 10952689
KCNH2	SERTINDOLE	inhibitor	PharmGKB TdgClinicalTrial	11689132 11511086 9694935
KCNH2	CHEMBL157885	activator	GuideToPharmacologyIntera	-
KCNH2	ROTLERIN	activator	GuideToPharmacologyIntera	-
KCNH2	CHEMBL1418045	activator	GuideToPharmacologyIntera	-
KCNH2	CHEMBL521083	activator	GuideToPharmacologyIntera	-
KCNH2	CHEMBL406931	activator	GuideToPharmacologyIntera	-
KCNH2	CHEMBL2158814	channel blocker	GuideToPharmacologyIntera	-
KCNH2	DISOPYRAMIDE	channel blocker	GuideToPharmacologyIntera	-
KCNH2	CEFADROXIL	channel blocker	GuideToPharmacologyIntera	-
KCNH2	IBUTILIDE	channel blocker	TdgClinicalTrial GuideToPha	-
KCNH2	CHEMBL1474918	gating inhibitor	GuideToPharmacologyIntera	-
KCNH2	PROPAFENONE	blocker	TdgClinicalTrial TEND TTD	-
KCNH2	AMIODARONE	blocker	TdgClinicalTrial TEND TTD	-
KCNH2	NERISPIRIDINE	blocker	TTD	-
KCNH2	PYRILAMINE	-	PharmGKB	-
KCNH2	DESMETHEYLSTEMIZOLE	-	PharmGKB	-
KCNH2	PERHEXILIENE	-	PharmGKB	-
KCNH2	AZIMILIDE	-	DrugBank	11573692 11060832
KCNH2	CLARITHROMYCIN	-	DrugBank	12873512
KCNH2	PROBUCOL	-	PharmGKB	-
KCNH2	DRONEDARONE	-	TdgClinicalTrial TEND Drug	17896959
KCNH2	LIDOFLAZINE	-	PharmGKB	-
KCNH2	SPARFLOXACIN	-	PharmGKB	-
KCNH2	TELITHROMYCIN	-	PharmGKB	-
KCNH2	FLUOXETINE	-	PharmGKB	-
KCNH2	METHADONE	-	PharmGKB	-
KCNH2	ESTRADIOL	-	NCI	18440994
KCNH2	SOTALOL	-	PharmGKB TdgClinicalTrial	-
KCNH2	MOXIFLOXACIN	-	PharmGKB NCI	16474415
KCNH2	LORATADINE	-	PharmGKB	-
KCNH2	PROPOFOL	-	NCI	16368812
KCNH2	LOVASTATIN	-	PharmGKB	-
KCNH2	CIMETIDINE	-	PharmGKB	-
KCNH2	PROCAINAMIDE	-	PharmGKB	-
KCNH2	PRENYLAMINE	-	PharmGKB	-
KCNH2	TERODILINE	-	PharmGKB	-
KCNH2	RISPERIDONE	-	PharmGKB	-
KCNH2	GREPAFLOXACIN	-	PharmGKB	-
KCNH2	LEVOMETHADYL ACETATE	-	PharmGKB	-
KCNH2	OLANZAPINE	-	PharmGKB	-
KCNH2	MIBEFRADIL	-	PharmGKB	-
KCNH2	BUDIODARONE	-	TdgClinicalTrial	-
KCNH2	DOXEPIN	-	PharmGKB	-
NDUFB10	METFORMIN HYDROCHLORIDE	inhibitor	ChemblInteractions	-
NDUFB10	ME-344	inhibitor	ChemblInteractions	-
NDUFB10	NV-128	inhibitor	ChemblInteractions	-
NDUFB10	CHEMBL1161866	-	DrugBank	17139284 17016423
ABL1	ADENOSINE TRIPHOSPHATE	inhibitor	DrugBank	11752352 17139284 17016423
ABL1	DASATINIB	multitarget inhibitor	PharmGKB MyCancerGenom	11287973 14745431 20537386 15256422 26758680 23676790 11853795 20697894 19466505 17496201 20367437 17701954 15381060 21895409 18818391 11964322 11752352 24456693 18615627 25157968 14559829 17016423 21562040 21505103 19652056 20131302 12399961 12200353
ABL1	NILOTINIB	inhibitor	MyCancerGenome TdgClini	17715389 11287973 20537386 17929114 20525993 23502220 19075254 23676790 16721371 12623848 20367437 17114651 18828913 12637609 28514312 21895409 11287972 21489624 11964322 20525995 25157968 21605905 19822896 21562040 22160483 19920925
ABL1	BOSUTINIB	inhibitor	MyCancerGenome TdgClini	14745431 15256422 23676790 11853795 20697894 12623848 19466505 20367437 17114651 18828913 15381060 21895409 21489624 11964322 24456693 18615627 25157968 14559829 21605905 21562040 21505103 19652056 12399961
ABL1	REGORAFENIB	inhibitor	ChemblInteractions DrugBa	-
ABL1	PONATINIB	inhibitor	MyCancerGenome TdgClini	20512393 14745431 20537386 11861307 15256422 11423618 20963643 22772060 22306673 23676790 11853795 23190221 22870928 20697894 21872826 12623848 19466505 12130516 20367437 17114651 18828913 24236021 15381060 23540562 21895409 21489624 23355941 11964322 25349473 24456693 18615627 25157968 23409026 14559829 21605905 21562040 21505103 19652056 15194504 21762985 12399961
ABL1	AT-9283	inhibitor	MyCancerGenome ChemblI	-
ABL1	XL-228	inhibitor	MyCancerGenome TdgClini	-
ABL1	IMATINIB	inhibitor	MyCancerGenome TdgClini	11287973 20537386 26758680 20525993 23502220 19075254 15930265 17496201 12637609 11287972 20525995 22160483 12476305 20131302 15194504 12200353
ABL1	BAFETINIB	inhibitor	MyCancerGenome GuideTo	-
ABL1	KW-2449	inhibitor	GuideToPharmacologyIntera	-
ABL1	PILOCARPINE	inhibitor	GuideToPharmacologyIntera	-
ABL1	CHEMBL1081312	inhibitor	GuideToPharmacologyIntera	-
ABL1	REBASTINIB	inhibitor	GuideToPharmacologyIntera	-
ABL1	SARACATINIB	inhibitor	GuideToPharmacologyIntera	-
ABL1	ABL-001	inhibitor	ChemblInteractions	-
ABL1	Flumatnib	inhibitor	ChemblInteractions	-
ABL1	PONATINIB HYDROCHLORIDE	inhibitor	ChemblInteractions	-
ABL1	NILOTINIB HYDROCHLORIDE MONOHYDRATE	inhibitor	ChemblInteractions	-
ABL1	IMATINIB MESYLATE	inhibitor	ChemblInteractions NCI	16205964 12910520
ABL1	AZD-0424	inhibitor	ChemblInteractions	-
ABL1	AZM-475271	inhibitor	ChemblInteractions	-
ABL1	VANDETANIB	-	CGI	-
ABL1	HYDROXYUREA	-	NCI	7923130
ABL1	CRIZOTINIB	-	CGI	-
ABL1	AXITINIB	-	CGI	-

Gene	Drug	Interaction_types	Sources	PMIDs
ABL1	TRAMETINIB	-	CGI	-
ABL1	Pexmetinib	-	TdgClinicalTrial	-
ABL1	VENETOCLAX	-	CGI	-
ABL1	FORETINIB	-	CGI	-
ABL1	ENMD-2076	-	TdgClinicalTrial	-
ABL1	MELPHALAN	-	NCI	7923130
ABL1	BUSULFAN	-	FDA	-
ABL1	CHEMBL327127	-	DrugBank	10592235
ABL1	MYRISTIC ACID	-	DrugBank	10592235
ABL1	ACYCLOVIR	-	NCI	8683981
ABL1	QUERCETIN	-	NCI	9349317
ABL1	CABOZANTINIB	-	CGI	-
ABL1	MASITINIB	-	TdgClinicalTrial	-
ABL1	GENISTEIN	-	NCI	9349317
ABL1	PROGESTERONE	-	NCI	10195429
ABL1	BLINATUMOMAB	-	FDA	-
ABL1	CHEMBL200177	-	DrugBank	10592235
ABL1	OXALAPLATIN	-	NCI	10098743
ABL1	CELECOXIB	-	NCI	16917206
ABL1	AZACITIDINE	-	NCI	2425967
PROZ	MENADIONE	activator	TEND DrugBank	17139284 17016423
PDF	CHEMBL431210	inhibitor	DrugBank	11752352
CSPG4	PHORBOL MYRISTATE ACETATE	-	NCI	18000864
GOT2	PYRIDOXAL PHOSPHATE	cofactor	DrugBank	236311 17139284 17016423
GOT2	ASPARTIC ACID	-	DrugBank	4404056 823072 10592235 17139284 261660 17016423
GOT2	DOCOSANOL	-	DrugBank	10592235 17139284 17016423
GOT2	L-GLUTAMATE	-	DrugBank	10592235 17139284 261660 17016423
CPT2	PERHEXILINE	inhibitor	TdgClinicalTrial TEND DrugBank	8694852 16306812 11117381
CPT2	ASPIRIN	inhibitor	GuideToPharmacologyIntera	-
CPT2	BENZQUINAMIDE	inhibitor	GuideToPharmacologyIntera	-
CPT2	CARPROFEN	inhibitor	GuideToPharmacologyIntera	-
CPT2	CELECOXIB	inhibitor	GuideToPharmacologyIntera	-
CPT2	DICLOFENAC	inhibitor	GuideToPharmacologyIntera	-
CPT2	ESFLURBIPROFEN	inhibitor	GuideToPharmacologyIntera	-
CPT2	ETODOLAC	inhibitor	GuideToPharmacologyIntera	-
CPT2	ETORICOXIB	inhibitor	GuideToPharmacologyIntera	-
CPT2	FLURBIPROFEN	inhibitor	GuideToPharmacologyIntera	-
CPT2	IBUPROFEN	inhibitor	GuideToPharmacologyIntera	-
CPT2	KETOPROFEN	inhibitor	GuideToPharmacologyIntera	-
CPT2	KETOROLAC	inhibitor	GuideToPharmacologyIntera	-
CPT2	LUMIRACOXIB	inhibitor	GuideToPharmacologyIntera	-
CPT2	MECLOFENAMIC ACID	inhibitor	GuideToPharmacologyIntera	-
CPT2	MEFENAMIC ACID	inhibitor	GuideToPharmacologyIntera	-
CPT2	MELOXICAM	inhibitor	GuideToPharmacologyIntera	-
CPT2	NAPROXINOD	inhibitor	GuideToPharmacologyIntera	-
CPT2	NAPROXEN	inhibitor	GuideToPharmacologyIntera	-
CPT2	NIMESULIDE	inhibitor	GuideToPharmacologyIntera	-
CPT2	NS-398	inhibitor	GuideToPharmacologyIntera	-
CPT2	OXAPROZIN	inhibitor	GuideToPharmacologyIntera	-
CPT2	ACETAMINOPHEN	inhibitor	GuideToPharmacologyIntera	-
CPT2	PHENYLBUTAZONE	inhibitor	GuideToPharmacologyIntera	-
CPT2	PIROXICAM	inhibitor	GuideToPharmacologyIntera	-
CPT2	RESVERATROL	inhibitor	GuideToPharmacologyIntera	-
CPT2	ROFECOXIB	inhibitor	GuideToPharmacologyIntera	-
CPT2	SUPROFEN	inhibitor	GuideToPharmacologyIntera	-
CPT2	VALDECOXIB	inhibitor	GuideToPharmacologyIntera	-
CPT2	LEVOCARNITINE	-	DrugBank	12445488 12662154 12408750 12464674 12684219
RYR2	ADENOSINE TRIPHOSPHATE	activator	GuideToPharmacologyIntera	-
RYR2	CAFFEINE	activator	GuideToPharmacologyIntera	-
RYR2	Ca2	antagonist activator	GuideToPharmacologyIntera	-
RYR2	RYANODINE	activator channel blocker	GuideToPharmacologyIntera	-
RYR2	SURAMIN	activator	GuideToPharmacologyIntera	-
RYR2	MAGNESIUM	antagonist	GuideToPharmacologyIntera	-
RYR2	PROCAINE	channel blocker	GuideToPharmacologyIntera	-
RYR2	RUTHENIUM RED	channel blocker	GuideToPharmacologyIntera	-
CACNA1B	VERAPAMIL	inhibitor	DrugBank	19125880
CACNA1B	GABAPENTIN	inhibitor modulator	TdgClinicalTrial ChembInte	20588320 16368827 18299583
CACNA1B	LEVETIRACETAM	inhibitor blocker	TdgClinicalTrial ChembInte	17461889 11879381
CACNA1B	CHEMBL15769	channel blocker	GuideToPharmacologyIntera	-
CACNA1B	AGMATINE	antagonist	DrugBank	12904272
CACNA1B	RALFINAMIDE	blocker	ChembInteractions TTD	-
CACNA1B	ZICONOTIDE	blocker	TdgClinicalTrial TTD	-
CACNA1B	CILNIDIPINE	blocker	TTD	-
CACNA1B	GABAPENTIN ENACARBIL	modulator	TdgClinicalTrial ChembInte	-
CACNA1B	ELPETRIGINE	blocker	ChembInteractions	-
CACNA1B	CNV2197944	blocker	TdgClinicalTrial ChembInte	-
CACNA1B	Z160	blocker	ChembInteractions	-
CACNA1B	ATAGABALIN	modulator	ChembInteractions	-
CACNA1B	ZICONOTIDE ACETATE	blocker	ChembInteractions	-
CACNA1B	IMAGABALIN	modulator	ChembInteractions	-
CACNA1B	BEPRIDIL HYDROCHLORIDE	blocker	ChembInteractions	-
CACNA1B	PREGABALIN	modulator	ChembInteractions	-
CACNA1B	AMLODIPINE	-	TEND	-
CACNA1B	CELECOXIB	-	PharmGKB	-
CACNA1B	CLEVIDIPINE	-	TEND	-
CACNA1B	SAFINAMIDE	-	TdgClinicalTrial	-
UBA3	PEVONEDISAT	inhibitor	TdgClinicalTrial ChembInte	-
PIK3CA	GSK-1059615	inhibitor	CKB ChembInteractions	-
PIK3CA	WX-037	inhibitor	ChembInteractions	-
PIK3CA	ALPELISIB	inhibitor	ClarityFoundationBiomarke	27672108 25877889 25172762 22915751 23275335 22653967 27974663 23085766 21169255 23721513 25425103 21362200 22355357 27602501 22188813 27126994 26627007 23136191 22065080 20881279 24076665 24900266 24561032 24608574 27451907 23850807 24310736 22049316 22915752 23726034 26013318 24198241 23258246 22340590 27402769 27604488 23662903 28119489 23903756 24244612
PIK3CA	AMG-319	inhibitor	GuideToPharmacologyIntera	-
PIK3CA	APITOLISIB	inhibitor	MyCancerGenome CKB Gui	26951309 26787751 21998291

Gene	Drug	Interaction_types	Sources	PMIDs
PIK3CA	AZD-6482	inhibitor	CKB GuideToPharmacology	
PIK3CA	AZD-8186	inhibitor	GuideToPharmacology Intera-	
PIK3CA	CANDICIDIN	inhibitor	CKB GuideToPharmacology	26839307
PIK3CA	BUPARLISIB	inhibitor	MyCancerGenome OncoKB	27672108 25877889 26715098 25172762 26909613 22915751 23275335 22653967 22159814 27974663 24470511 23085766 21169255 23721513 25425103 21362200 22355357 22188813 27126994 23136191 22065080 20881279 24076665 24900266 23940356 28539475 24561032 24608574 23850807 24310736 22049316 26098748 22915752 23726034 26013318 24198241 23258246 22340590 27402769 23662903 28119489 23903756 24244612
PIK3CA	PA-799	inhibitor	CKB GuideToPharmacology	25231405 21558396
PIK3CA	CLUDC-907	inhibitor	CKB GuideToPharmacology	22693356 20570890
PIK3CA	DACTOLISIB	inhibitor	ClarityFoundationBiomarke	21966435 26272063 23629727 22543857 27974663 23475782 26270481 28446642 24939055 23619167 26627007 19029981 26232337 24927217 26013318 22662154 26137449
PIK3CA	DUVELISIB	inhibitor	GuideToPharmacology Intera-	
PIK3CA	PHENMETRAZINE	inhibitor	OncoKB CKB GuideToPharm	27672108 25877889 25172762 22653967 21169255 23721513 23258740 21362200 22355357 22188813 23136191 22065080 20881279 24076665 24900266 24561032 22294718 24608574 23394218 23850807 24310736 22049316 23726034 26137449 22340590 21668414 23662903 23903756 24244612
PIK3CA	GEDATOLISIB	inhibitor	ClarityFoundationBiomarke	24042735 25977343 24823695 17314276 25688157 21325073
PIK3CA	IDELALISIB	inhibitor	CKB GuideToPharmacology	26466009 26137449
PIK3CA	INK-128	inhibitor	OncoKB CKB GuideToPharm	25877889 26272063 25261369 22915751 23275335 27974663 23085766 25425103 22188813 27126994 24900266 22915752 23726034 24198241 27402769 23903756
PIK3CA	OXAZEPAM	inhibitor	GuideToPharmacology Intera-	
PIK3CA	CHEMBL1086377	inhibitor	GuideToPharmacology Intera-	
PIK3CA	LY-294002	inhibitor	CKB GuideToPharmacology	18262558
PIK3CA	LY-3023414	inhibitor	CKB GuideToPharmacology	27439478
PIK3CA	OMIPALISIB	inhibitor	ClarityFoundationBiomarke	26603258
PIK3CA	PF-04691502	inhibitor	ClarityFoundationBiomarke	21750219
PIK3CA	PI-103	inhibitor	MyCancerGenome CKB Gui	22336586
PIK3CA	CHEMBL568150	inhibitor	GuideToPharmacology Intera-	
PIK3CA	CHEMBL1231533	inhibitor	GuideToPharmacology Intera-	
PIK3CA	PICTILISIB	inhibitor	MyCancerGenome CKB Gui	27489350 23674493 27174596 24601221 22084396 27020857 23888070 23136191 24339963 27197306 26058079 27604488 27196766 28119489
PIK3CA	PILARALISIB (CHEMBL3360203)	inhibitor	GuideToPharmacology Intera-	
PIK3CA	CHEMBL1081312	inhibitor	GuideToPharmacology Intera-	
PIK3CA	YOHIMBINE	inhibitor	OncoKB GuideToPharmacol	27672108 25877889 25172762 22915751 23275335 22653967 23085766 21169255 23721513 25425103 21362200 22355357 22188813 27126994 23136191 22065080 20881279 24076665 24900266 24561032 24608574 23850807 24310736 22049316 22915752 23726034 24198241 23258246 22340590 27402769 23662903 23903756 24244612
PIK3CA	TASELISIB	inhibitor	MyCancerGenome OncoKB	27672108 25877889 25172762 22653967 21169255 23721513 28331003 21362200 22355357 22188813 23136191 22065080 26333383 20881279 24076665 24900266 24561032 24608574 23850807 24310736 22049316 23726034 26589432 23258246 22340590 23662903 23903756 24244612
PIK3CA	TG100-115	inhibitor	GuideToPharmacology Intera-	
PIK3CA	VS-5584	inhibitor	CKB GuideToPharmacology	23270925
PIK3CA	WORTMANNIN	inhibitor	GuideToPharmacology Intera-	10592235
PIK3CA	ZSTK-474	inhibitor	ClarityFoundationBiomarke	26137449
PIK3CA	DS-7423	inhibitor	ClarityFoundationBiomarke	24504419
PIK3CA	INK-1117	inhibitor	MyCancerGenome CKB Che	28490463
PIK3CA	MLN-1117	inhibitor	ChembIInteractions	-
PIK3CA	RECLISIB	inhibitor	ChembIInteractions	-
PIK3CA	Panulisib	inhibitor	CKB ChembIInteractions	25700704
PIK3CA	PKI-179	inhibitor	CKB ChembIInteractions	20797855
PIK3CA	PWT-33587	inhibitor	ChembIInteractions	-
PIK3CA	RG-7666	inhibitor	ChembIInteractions	-
PIK3CA	COPANLISIB	inhibitor	ClarityFoundationBiomarke	27672108 25877889 25172762 22653967 21169255 23721513 24170767 21362200 22355357 22188813 23136191 22065080 20881279 24076665 24900266 24561032 24608574 23850807 24310736 22049316 23726034 23258246 22340590 23662903 23903756 24244612
PIK3CA	VOXTALISIB	inhibitor	ClarityFoundationBiomarke	24583798 24634413
PIK3CA	SONOLISIB	inhibitor	MyCancerGenome CKB Che	22693357
PIK3CA	SF-1126	inhibitor	MyCancerGenome TdgClinic-	
PIK3CA	QUERCETIN	inhibitor	MyCancerGenome NCI	17045724
PIK3CA	PWT-33579	inhibitor	ChembIInteractions	-
PIK3CA	SAR-260301	inhibitor	CancerCommons	-
PIK3CA	BAY-1082439	inhibitor	CKB ChembIInteractions	-
PIK3CA	BGT-226 (CHEMBL3545096)	inhibitor	ChembIInteractions	-
PIK3CA	GSK-2636771	inhibitor	MyCancerGenome	-
PIK3CA	PILARALISIB (CHEMBL3218575)	inhibitor	MyCancerGenome CKB Dru	24166903 25637314 21216929
PIK3CA	Puquitinib	inhibitor	ChembIInteractions	-
PIK3CA	BUPARLISIB HYDROCHLORIDE	inhibitor	MyCancerGenome ClinicalTre-	
PIK3CA	DEGUELIN	-	CKB	24978597 20811676
PIK3CA	SELMETINIB	-	CKB	26272063 22271687 24939055 21358673 26232337 26137449
PIK3CA	PERTUZUMAB	-	CKB	23940356
PIK3CA	CAPECITABINE	-	CKB	26920887
PIK3CA	TAMOXIFEN	-	CKB	26116361
PIK3CA	CARBOPLATIN	-	CKB NCI	16275998 21216929
PIK3CA	CABOZANTINIB	-	CIVIC	25242168
PIK3CA	U-0126	-	CKB	21358673
PIK3CA	MK-2206	-	CKB CIVIC	26187616 23888070 26627007 26084990 21289267 22932669
PIK3CA	CHEMBL376408	-	CKB	27974663
PIK3CA	IRINOTECAN	-	CKB NCI	24042735 16707468 15809721 25714871 21325073
PIK3CA	OSI-027	-	CKB	21673091
PIK3CA	VENETOCLAX	-	CKB	27974663
PIK3CA	PONATINIB	-	CKB	26270481
PIK3CA	TEMSIROLIMUS	-	ClarityFoundationBiomarke	27893038 22271473 22245973 19706758 25527417 21216929 21289267 27016228
PIK3CA	FLOXURIDINE	-	CKB	25714871
PIK3CA	MSC-2363318A	-	CKB	27186432
PIK3CA	LAPATINIB	-	CKB CIVIC	27687302 26270481 26627007 23940356 26245675 22294718 26920887

Gene	Drug	Interaction_types	Sources	PMIDs
PIK3CA	DOXORUBICIN	-	CKB NCI	16905201 27893038 12761490
PIK3CA	Ribociclib	-	OncoKB CIVIC	25877889 22915751 23275335 23085766 25425103 22188813 27126994 24900266 22915752 23726034 24198241 27402769 25002028 23903756
PIK3CA	SIROLIMUS	-	CKB NCI CIVIC	15647370 15878982 26882569 28514312 19029981 17376864
PIK3CA	COBIMETINIB	-	CKB	22084396
PIK3CA	PERIFOSINE	-	CIVIC	19706758
PIK3CA	BENZONATATE	-	CKB	27974663
PIK3CA	TOPOTECAN	-	CKB	21216929
PIK3CA	AZD-8055	-	CKB	28446642 22271687
PIK3CA	ETRETINATE	-	NCI	15020266
PIK3CA	LETROZOLE	-	OncoKB CKB	25877889 22915751 23275335 23085766 25425103 22188813 27126994 24900266 22915752 23726034 24198241 27402769 23903756
PIK3CA	LY-2780301	-	CKB	28750271 25902900
PIK3CA	BORTEZOMIB	-	CKB	21216929
PIK3CA	CAMPTOTHECIN	-	CKB NCI	24042735 12464623 25688157
PIK3CA	CETUXIMAB	-	CKB CGI CIVIC	26715098 25714871 28446642 25724520 25838391 20619739 19223544 28424201 27002107
PIK3CA	CHEMBL126955	-	NCI	16267832
PIK3CA	Acalisib	-	CKB	-
PIK3CA	SURAMIN	-	NCI	15833899
PIK3CA	PACLITAXEL	-	CKB NCI	26469692 24170767 12761490 26245675 21216929
PIK3CA	PIMASERTIB	-	CKB	23629727
PIK3CA	A-443654	-	CKB	24978597 19208828 24569089
PIK3CA	CHEMBL1765740	-	CKB	27451907
PIK3CA	DEMCIZUMAB	-	CKB	26855149
PIK3CA	BAY-1125976	-	CKB	27699769
PIK3CA	OLAPARIB	-	OncoKB CKB	25877889 26909613 22915751 23275335 23085766 25425103 22188813 27126994 24900266 22915752 23726034 24198241 27402769 23903756
PIK3CA	ZINC SULFATE	-	NCI	15715661
PIK3CA	LUCITANIB	-	CKB	27126994
PIK3CA	AEW-541	-	CKB	27196766
PIK3CA	PRASTERONE	-	NCI	15501480
PIK3CA	NAVITOXCLAX	-	CKB	27659046 27197306
PIK3CA	REGRAMOSTIM	-	NCI	15107457
PIK3CA	REGORAFENIB	-	CKB	23629727 25838391
PIK3CA	DASATINIB	-	CKB	26855149
PIK3CA	BEVACIZUMAB	-	CKB	27893038 23940356 21216929 25363205
PIK3CA	ARQ-092	-	CKB	26469692
PIK3CA	CHEMBL589258	-	CKB	20371716
PIK3CA	VINCRIStINE	-	NCI	12874004
PIK3CA	CHEMBL263664	-	CKB	21191045
PIK3CA	EVEROLIMUS	-	ClarityFoundationBiomarker	25877889 26951309 23629727 27797976 22915751 23275335 20664174 20664172 23085766 25425103 27893038 22188813 27126994 24900266 21358673 27091708 22915752 23726034 22662154 24198241 27402769 23903756
PIK3CA	MILTEFOSINE	-	NCI	16752184
PIK3CA	NERATINIB	-	CKB	26627007 26333383 26243863
PIK3CA	SULINDAC	-	NCI	12654560
PIK3CA	RIDAFOROLIMUS	-	CKB	26187616
PIK3CA	TRASTUZUMAB	-	OncoKB CKB CGI CIVIC	25877889 17936563 22915751 23275335 21676217 24470511 27687302 23085766 25425103 26469692 22188813 27126994 28167203 24900266 23940356 20453058 26245675 22294718 22915752 23726034 21558396 24198241 27402769 23903756
PIK3CA	AFURESERIB	-	CKB	24978597
PIK3CA	METFORMIN	-	CKB	23986086
PIK3CA	DABRAFENIB	-	CKB	27797976
PIK3CA	IPATASERTIB	-	CKB	24141624
PIK3CA	FLUOROURACIL	-	CKB	25714871 22336586 28424201
PIK3CA	SORAFENIB	-	CKB	23629727 25363205
PIK3CA	CC-223	-	CKB	24978597 25855786 26177599
PIK3CA	GEMCITABINE	-	CKB	28750271
PIK3CA	TORIN1	-	CKB	27974663
PIK3CA	PANITUMUMAB	-	CIVIC	19223544
PIK3CA	FULVESTRANT	-	OncoKB CKB	27672108 25877889 25172762 22653967 27174596 21169255 23721513 21362200 22355357 22188813 23136191 22065080 20881279 24076665 24900266 24561032 24608574 23850807 24310736 22049316 23726034 23258246 22340590 23662903 23903756 24244612
PIK3CA	DOCETAXEL	-	PharmGKB	-
PIK3CA	UPROSERTIB	-	CKB	-
PIK3CA	TRASTUZUMAB EMTANSINE	-	CKB	26920887
PIK3CA	PD-0325901	-	CKB	26272063 24339963 21325073
PIK3CA	HERBIMYCIN	-	NCI	11139143
PIK3CA	INFIGRATINIB	-	CKB	28119489
PIK3CA	TAK-733	-	CKB	26439693
PIK3CA	VEMURAFENIB	-	CKB	24265153 26137449
PIK3CA	AT-13148	-	CKB	22781553
PIK3CA	PALBOCICLIB	-	CKB CIVIC	27020857 25002028 26369631
PIK3CA	RALOXIFENE	-	NCI	11901050
PIK3CA	TRAMETINIB	-	CKB	27659046 27797976 26882569 26469692 26627007 26369631
PIK3CA	INDOLE-3-CARBINOL	-	NCI	11948137
PIK3CA	ALVOCICLIB	-	NCI	14767524
PIK3CA	MIDOSTAURIN	-	NCI	11719451
PIK3CA	RIGOSERTIB	-	TdgClinicalTrial CKB	23873848 27104980
PIK3CA	LINSTINIB	-	CKB	27196766
PIK3CA	CHEMBL428462	-	CKB	24978597 20423992
PIK3CA	STREPTOZOTOCIN	-	NCI	16130182
PIK3CA	AZD-5363	-	OncoKB CKB CIVIC	26116361 23258740 19755509 24088382 22294718 23394218
PIK3CA	RESVERATROL	-	NCI	15925284
HPSE	MUPARFOSTAT (CHEMBL1615835)	inhibitor	ChemblInteractions	-
HPSE	HEPARIN	-	TdgClinicalTrial	-
HPSE	THROMBIN	-	NCI	1612123
TLR3	RINTATOLIMOD	agonist	ChemblInteractions	-
TLR3	PYROXAMIDE	-	NCI	16670286
TLR3	HYDROXYCHLOROQUINE	-	NCI	16142732
PRKAA1	ADENOSINE PHOSPHATE	activator	DrugBank	17167165
PRKAA1	PHENFORMIN	activator	TdgClinicalTrial TEND DrugBank	17369473 17995453 17603555

Gene	Drug	Interaction_types	Sources	PMIDs
PRKAA1	ASPIRIN	activator	DrugBank	22517326 22406476
PRKAA1	PHORBOL MYRISTATE ACETATE	-	NCI	15383372
PRKAA1	PENTOSTATIN	-	NCI	11969266
PRKAA1	STREPTOZOTOCIN	-	NCI	15616011
PRKAA1	ADENOSINE TRIPHOSPHATE	-	DrugBank	17139284 17016423
PRKAA1	SIROLIMUS	-	NCI	16027121
PRKAA1	EHNA	-	NCI	11969266
PRKAA1	METFORMIN HYDROCHLORIDE	-	ClarityFoundationClinicalTr	-
PRKAA1	THYROXINE	-	NCI	12433937
GRIA4	MIBAMPATOR	positive allosteric modulator	ChEMBLInteractions	-
GRIA4	(R,S)-AMPA	agonist	GuideToPharmacologyIntera	-
GRIA4	CHEMBL123132	agonist	GuideToPharmacologyIntera	-
GRIA4	ANIRACETAM	allosteric modulator	GuideToPharmacologyIntera	-
GRIA4	CHEMBL136800	allosteric modulator	GuideToPharmacologyIntera	-
GRIA4	CHEMBL1255648	allosteric modulator	GuideToPharmacologyIntera	-
GRIA4	CYCLOTHIAZIDE	allosteric modulator	GuideToPharmacologyIntera	-
GRIA4	CHEMBL77862	allosteric modulator	GuideToPharmacologyIntera	-
GRIA4	CHEMBL334920	allosteric modulator	GuideToPharmacologyIntera	-
GRIA4	CHEMBL1097939	allosteric modulator	GuideToPharmacologyIntera	-
GRIA4	PIRACETAM	allosteric modulator	GuideToPharmacologyIntera	-
GRIA4	CHEMBL320642	allosteric modulator	GuideToPharmacologyIntera	-
GRIA4	CHEMBL265301	antagonist	GuideToPharmacologyIntera	-
GRIA4	GYKI-52466	antagonist	GuideToPharmacologyIntera	-
GRIA4	NBQX	antagonist	GuideToPharmacologyIntera	-
GRIA4	TEZAMPANEL	antagonist	TdgClinicalTrial GuideToPha	-
GRIA4	JORO SPIDER TOXIN 3	channel blocker	GuideToPharmacologyIntera	-
GRIA4	IRAMPANEL	antagonist	ChEMBLInteractions	-
GRIA4	CX1739	positive allosteric modulator	ChEMBLInteractions	-
GRIA4	PF-04958242	positive allosteric modulator	ChEMBLInteractions	-
GRIA4	Selurampanel	antagonist	TdgClinicalTrial ChEMBLInte	-
GRIA4	DASOLAMPANEL	antagonist	ChEMBLInteractions	-
GRIA4	BECAMPANEL	antagonist	ChEMBLInteractions	-
GRIA4	FARAMPATOR	positive allosteric modulator	ChEMBLInteractions	-
GRIA4	MK-8777	positive allosteric modulator	ChEMBLInteractions	-
GRIA4	ZONAMPANEL	antagonist	ChEMBLInteractions	-
GRIA4	PERAMPANEL	antagonist	TdgClinicalTrial ChEMBLInte	-
GRIA4	TOPIRAMATE	antagonist	ChEMBLInteractions	-
GRIA4	L-GLUTAMATE	-	DrugBank	12008069 7679210 17139284 11406192 17016423
GRIA4	CHEMBL222418	-	GuideToPharmacologyIntera	-
GRIA4	TALAMPANEL	-	TdgClinicalTrial DrugBank	12581229 16861112 17199027
COL11A2	COLLAGENASE CLOSTRIDIUM HISTOLYTICUM	-	ChEMBLInteractions	-
COL11A2	OCRIPLASMIN	-	ChEMBLInteractions	-
NPR2	CENDERITIDE	agonist activator	TdgClinicalTrial GuideToPha	-
NPR2	VOSORITIDE	agonist	GuideToPharmacologyIntera	-
NPR2	KETOPROFEN	antagonist	GuideToPharmacologyIntera	-
NPR2	ERYTHRITYL TETRANITRATE	agonist	TdgClinicalTrial TEND DrugB	19406636 17139284 17016423
NPR2	NESIRITIDE	-	TdgClinicalTrial TEND DrugB	-
NPR2	PREDNISOLONE SODIUM PHOSPHATE	-	GuideToPharmacologyIntera	-
GRID1	L-GLUTAMATE	-	DrugBank	17139284 17016423
FGFR2	INFIGRATINIB	inhibitor	TALC OncoKB CKB GuideToPha	27401245 23443805 24122810 26036639 28034880 27870574 27216979 28119489 24563622 26048680
FGFR2	PALIFERMIN	binder agonist	TdgClinicalTrial GuideToPha	17456767 16854582 16390600 10593896 11752352 7499435 17728847 9056643
FGFR2	THALIDOMIDE	antagonist	TdgClinicalTrial TEND DrugB	20616958
FGFR2	AZD-4547	inhibitor	TALC MyCancerGenome CK	26351320 27595477 27550940 27401245 26936917 27179038 25169980 26294741 22869148
FGFR2	JNJ-42756493	inhibitor	OncoKB CKB GuideToPharm	26324363 24122810 28341788
FGFR2	LY-2874455	inhibitor	GuideToPharmacologyIntera	-
FGFR2	MK-2461	inhibitor	GuideToPharmacologyIntera	-
FGFR2	NINTEDANIB	inhibitor inhibitor	TALC MyCancerGenome Td	22238366 18559524
FGFR2	REGORAFENIB	inhibitor	ChEMBLInteractions DrugBa	-
FGFR2	PONATINIB	inhibitor	TALC MyCancerGenome CK	22238366 26619011 26574622 18552176 23908597 23002168 24550739 26048680 23468082
FGFR2	XL-228	inhibitor	TALC MyCancerGenome	-
FGFR2	INTERFERON ALFA-2A	binder	TTD	-
FGFR2	MASITINIB	inhibitor	MyCancerGenome	-
FGFR2	AEE-788	inhibitor	TTD	-
FGFR2	TRAFERMIN	activator	TdgClinicalTrial TTD	-
FGFR2	DOVITINIB	inhibitor	TALC MyCancerGenome Td	22238366 26619011 23658459 23443805 18552176 23908597 23002168 26036639
FGFR2	LENVATINIB	inhibitor	TALC	-
FGFR2	PENTOSAN POLYSULFATE SODIUM	inhibitor	TTD	-
FGFR2	NINTEDANIB ESYLATE	inhibitor	ChEMBLInteractions	-
FGFR2	ENMD-981693	inhibitor	ChEMBLInteractions	-
FGFR2	ARQ-087	inhibitor	TdgClinicalTrial CKB ChEM	-
FGFR2	BRIVANIB ALANINATE	inhibitor	ChEMBLInteractions	-
FGFR2	ORANTINIB	inhibitor	ChEMBLInteractions	-
FGFR2	BRIVANIB	inhibitor	CKB ChEMBLInteractions	22238366
FGFR2	RG-1530	inhibitor	ChEMBLInteractions	-
FGFR2	XL-999	inhibitor	ChEMBLInteractions	-
FGFR2	CP-459632	inhibitor	ChEMBLInteractions	-
FGFR2	LUCITANIB	inhibitor	ChEMBLInteractions	-
FGFR2	TG100-801	inhibitor	ChEMBLInteractions	-
FGFR2	BAY-1163877	inhibitor	ChEMBLInteractions	-
FGFR2	ENMD-2076	-	TdgClinicalTrial ClarityFou	-
FGFR2	TRAMETINIB	-	CKB	27338794
FGFR2	SELUMETINIB	-	CKB	26438159 19755509
FGFR2	CETUXIMAB	-	CKB	27149458
FGFR2	PD-173074	-	CKB CIVIC	27179038 23908597 24122810 26036639 22869148 18757403
FGFR2	LAPATINIB	-	CKB	27595477
FGFR2	CHEMBL315546	-	DrugBank	11752352
FGFR2	PHA-665752	-	CKB	26351320
FGFR2	CEDIRANIB	-	CKB	22238366
FGFR2	SUNITINIB	-	CKB	27149458
FGFR2	PICTILISIB	-	CKB	28119489
FGFR2	BUPARLISIB	-	CKB	28119489
FGFR2	Ro-4987655	-	CKB	26438159
FGFR2	PAZOPANIB	-	CIVIC DoCM	23786770 24550739
FGFR2	TRABECTEDIN	-	CKB	26036639

Gene	Drug	Interaction_types	Sources	PMIDs
FGFR2	CHEMBL233209	-	DrugBank	17139284 17016423
FGFR2	ALPELUSIB	-	CKB	28119489
FGFR2	GEFITINIB	-	CKB	26936917
HRAS	LONAFARNIB	inhibitor	GuideToPharmacologyIntera	-
HRAS	STREPTOZOTOCIN	-	NCI	8171758
HRAS	EDARAVONE	-	NCI	3489774
HRAS	BEVACIZUMAB	-	NCI	15998951
HRAS	DASATINIB	-	CKB	27222538
HRAS	ALPELUSIB	-	CKB	-
HRAS	GUANOSINE TRIPHOSPHATE	-	DrugBank	10592235 17139284 17016423
HRAS	DACTOLISIB	-	CKB	21831957
HRAS	SF-1126	-	CKB	25425962
HRAS	PD-173074	-	CKB	22869148
HRAS	BUPARLISIB	-	CKB	26544513
HRAS	HYDROXYUREA	-	NCI	12041671
HRAS	CHEMBL35482	-	NCI	12883735
HRAS	TIPIFARNIB	-	CGI	-
HRAS	AZD-8055	-	CKB CIVIC	26544513
HRAS	CHEMBL384759	-	DrugBank	10592235 17139284 17016423
HRAS	TRAMETINIB	-	CKB	26343583 28783719 26882569 27222538
HRAS	CI-1040	-	CKB	26267534
HRAS	ANTIBIOTIC	-	NCI	9422737
HRAS	N-METHYL-N-NITROSUREA	-	NCI	10391687
HRAS	DIETHYLSTILBESTROL	-	NCI	1980008
HRAS	TRIFLUOROETHANOL	-	DrugBank	10592235 17139284 17016423
HRAS	AZD-4547	-	CKB	22869148
HRAS	CHEMBL387187	-	CIVIC	26561417
HRAS	BRYOSTATIN	-	NCI	16483930
HRAS	BINIMETINIB	-	CKB	26544513
HRAS	1,6-HEXANEDIOL	-	DrugBank	10592235 17139284 17016423
HRAS	SELUMETINIB	-	CKB CIVIC	26544513 27222538
HRAS	DIMETHYL SULFOXIDE	-	NCI	3856429
HRAS	SIROLIMUS	-	CKB	26882569
HRAS	CETUXIMAB	-	CKB	22797062
HRAS	DOCETAXEL	-	NCI	16983095
HRAS	GEMCITABINE	-	NCI	16818479
HRAS	PANITUMUMAB	-	CKB	22797062
HRAS	E-6201	-	CKB	23039341
HRAS	RIGOSERTIB	-	CKB	27104980
HRAS	VITAMIN E	-	NCI	9750015 16166287
HRAS	PD-0325901	-	CIVIC	26544513
HRAS	NITROGLYCERIN	-	NCI	8968066
HRAS	CABOZANTINIB	-	CKB	27525386
HRAS	EPOETIN BETA	-	NCI	9104820
HRAS	HEXAMETHYLENEBISACETAMIDE	-	NCI	3856429
HRAS	MK-2206	-	CKB	21289267
HRAS	EVEROLIMUS	-	CKB CIVIC	26544513
HRAS	METFORMIN	-	CKB	26921394 26951660
HRAS	CHEMBL1221512	-	NCI	9515813
NARS2	ASPARAGINE	-	DrugBank	12874385 16753178
ATM	CHEMBL1221601	inhibitor	GuideToPharmacologyIntera	-
ATM	KU-55933	inhibitor	GuideToPharmacologyIntera	-
ATM	VALPROIC ACID	-	CKB	20739657
ATM	BENDAMUSTINE	-	CKB	20739657
ATM	AZD-6738	-	CKB CGI	26563132 26517239
ATM	TEMOZOLOMIDE	-	CGI CIVIC	23960094
ATM	IBRUTINIB	-	CKB	26563132
ATM	VANDETANIB	-	CKB	27683183
ATM	VX-970	-	CKB	28363999
ATM	IRINOTECAN	-	CKB CGI	27638859
ATM	QUINPIROLE	-	CGI	-
ATM	CHEMBL188678	-	CIVIC	23761041
ATM	RUCAPARIB	-	ClarityFoundationBiomarke	-
ATM	VELIPARIB	-	ClarityFoundationBiomarke	21300883 27638859
ATM	CHEMBL1086377	-	CIVIC	23761041
ATM	SELUMETINIB	-	CIVIC	27922010
ATM	BINIMETINIB	-	CKB	28514312
ATM	PACLITAXEL	-	CKB	26282658
ATM	TALAZOPARIB	-	ClarityFoundationBiomarke	23881923
ATM	TRAMETINIB	-	CIVIC	27922010
ATM	NIRAPARIB	-	ClarityFoundationBiomarke	-
ATM	OLAPARIB	-	ClarityFoundationBiomarke	20739657 26510020 28363999 20124459 24841718 8 2014 26282658
ATM	AZD-6482	-	CKB	26563132
ATM	FLUDARABINE	-	CKB	20739657
ATM	EVEROLIMUS	-	CKB	27683183
WNK1	CHEMBL306380	inhibitor	GuideToPharmacologyIntera	-
TAO3	CHEMBL524266	inhibitor	GuideToPharmacologyIntera	-
PDXDC1	PYRIDOXAL PHOSPHATE	cofactor	DrugBank	17139284 17016423
UMOD	RETINOL	-	NCI	6224621
SPHK1	CHEMBL2376441	inhibitor	GuideToPharmacologyIntera	-
SPHK1	PHENYLEPHRINE	inhibitor	GuideToPharmacologyIntera	-
SPHK1	IDRONOXIL	-	TdgClinicalTrial	-
SPHK1	CHEMBL2158685	-	TdgClinicalTrial	-
P4HB	LOMITAPIDE MESYLATE	inhibitor	ChemblInteractions	-
P4HB	RIBOSTAMYCIN	-	DrugBank	11741285
MC4R	SETMELANOTIDE	agonist	GuideToPharmacologyIntera	-
MC4R	CORTICOTROPIN	agonist	GuideToPharmacologyIntera	-
MC4R	AFAMELANOTIDE	agonist	GuideToPharmacologyIntera	-
MC4R	MELANONAN	agonist	GuideToPharmacologyIntera	-
MC4R	CHEMBL339053	agonist	GuideToPharmacologyIntera	-
MC4R	CHEMBL11348	antagonist	GuideToPharmacologyIntera	-
MC4R	CHEMBL358015	antagonist	GuideToPharmacologyIntera	-
MC4R	CHEMBL2096742	antagonist	GuideToPharmacologyIntera	-
MC4R	CHEMBL329011	antagonist	GuideToPharmacologyIntera	-
MC4R	BREMELANOTIDE	agonist	TdgClinicalTrial ChemblInte	-
MC4R	PF-00446687	agonist	ChemblInteractions	-
MC4R	CLOZAPINE	-	PharmGKB	-
MC4R	OLANZAPINE	-	PharmGKB	-
THBD	CURCUMIN	-	NCI	15733976

Gene	Drug	Interaction_types	Sources	PMIDs
THBD	DROTRECOGIN ALFA (ACTIVATED)	-	DrugBank	3039877 11804648 15252033 2836377 1660324
THBD	ALPROSTADIL	-	NCI	7684300
THBD	LEVOTHYROXINE	-	NCI	14763909
THBD	SIMVASTATIN	-	NCI	18663903
THBD	GINKGO	-	NCI	17044640
THBD	CLOSTAZOL	-	NCI	10918946
EP300	METHYLPHENIDATE	inhibitor	GuideToPharmacologyIntera-	-
EP300	CURCUMIN	inhibitor	GuideToPharmacologyIntera-	-
EP300	EPIGALOCATECHIN GALLATE	inhibitor	GuideToPharmacologyIntera-	-
EP300	GARCINOL	inhibitor	GuideToPharmacologyIntera-	-
EP300	PLUMBAGIN	inhibitor	GuideToPharmacologyIntera-	-
PDE7A	DYPHYLLINE	inhibitor	TdgClinicalTrial TEND DrugBa	17139284 17016423
PDE7A	CHEMBL484928	inhibitor	GuideToPharmacologyIntera-	-
PDE7A	CRISABOROLE	inhibitor	GuideToPharmacologyIntera-	-
PDE7A	PENTOXIFYLLINE	inhibitor	ChemblInteractions	-
PDE7A	FLAVOXATE HYDROCHLORIDE	inhibitor	ChemblInteractions	-
PDE7A	DIPYRIDAMOLE	inhibitor	ChemblInteractions	-
PDE7A	ISOBUTYLMETHYLXANTHINE	-	DrugBank	10592235
PDE7A	CHEMBL1236215	-	DrugBank	10592235
ATR	VX-970	inhibitor	ChemblInteractions	-
ATR	AZD-6738	inhibitor	GuideToPharmacologyIntera-	-
ATR	CHEMBL1221601	inhibitor	GuideToPharmacologyIntera-	-
ATR	DACTOLISIB	inhibitor	GuideToPharmacologyIntera-	-
ATR	QLAPARIB	-	ClarityFoundationBiomarke-	-
ATR	NIRAPARIB	-	ClarityFoundationBiomarke-	-
ATR	TALAZOPARIB	-	ClarityFoundationBiomarke-	-
ATR	VELIPARIB	-	ClarityFoundationBiomarke-	-
ATR	RUCAPARIB	-	ClarityFoundationBiomarke-	-
ATR	TEMOZOLOMIDE	-	CGI	-
GRM8	CHEMBL34453	agonist	GuideToPharmacologyIntera-	-
GRM8	CHEMBL1319383	agonist	GuideToPharmacologyIntera-	-
GRM8	EGLUMEGAD	agonist	GuideToPharmacologyIntera-	-
GRM8	CHEMBL277475	agonist	GuideToPharmacologyIntera-	-
GRM8	CHEMBL143210	agonist	GuideToPharmacologyIntera-	-
GRM8	CHEMBL33567	agonist	GuideToPharmacologyIntera-	-
GRM8	DEXFOSFOSERINE	agonist	GuideToPharmacologyIntera-	-
GRM8	TRIAMCINOLONE DIACETATE	allosteric modulator	GuideToPharmacologyIntera-	-
GRM8	CHEMBL284193	antagonist	GuideToPharmacologyIntera-	-
GRM8	CHEMBL432038	antagonist	GuideToPharmacologyIntera-	-
GRM8	CHEMBL86508	antagonist	GuideToPharmacologyIntera-	-
GRM8	L-GLUTAMATE	-	DrugBank	17360958 16957773
EEF2	DENILEUKIN DIFTITOX	inhibitor	ChemblInteractions	-
EEF2	CHEMBL384759	-	DrugBank	10592235 17139284 17016423
EEF2	OPORTUZUMAB MONATOX	-	TdgClinicalTrial	-
EEF2	PJ34 (CHEMBL372303)	-	DrugBank	10592235
EEF2	SS1(dsFv)-PE38	-	TdgClinicalTrial	-
ADAMTS1	CERIVASTATIN	-	PharmGKB	-
XRCC3	FLUOROURACIL	-	PharmGKB	-
XRCC3	DOCE TAXEL	-	PharmGKB	-
XRCC3	CARBOQUONE	-	PharmGKB	-
PTCH1	VISMODEGIB	inhibitor	MyCancerGenome OncoKB	24900187 22670903 24651015 19726763 22670904 24523439 19726761
PTCH1	FORETINIB	-	CGI	-
PTCH1	TRETINOIN	-	NCI	12455633
PTCH1	ERISMODEGIB	-	OncoKB CIViC	24900187 22670903 24651015 22670904 24523439
SLC16A1	PENTAMIDINE ISETHIONATE	inhibitor	GuideToPharmacologyIntera-	-
SLC16A1	PHORBOL MYRISTATE ACETATE	-	NCI	14525727
SLC16A1	SODIUM BUTYRATE	-	NCI	11882670
SLC16A1	PYRUVATE	-	DrugBank	16213084 16326938 16110503 17583564 17606506
F5	DROTRECOGIN ALFA (ACTIVATED)	multitarget antagonist inhibitor	PharmGKB TdgClinicalTrial	11893230 12030642 11714212 11752352 12004250 11236773
F5	ESTRONE SODIUM SULFATE	-	PharmGKB	-
F5	THROMBOMODULIN ALFA	-	DrugBank	-
F5	THROMBIN	-	TdgClinicalTrial	-
F5	TAMOXIFEN	-	PharmGKB FDA	-
F5	ELTROMBOPAG	-	FDA	-
PSME4	BORTEZOMIB	inhibitor	MyCancerGenome	-
PSME4	CARFILZOMIB	inhibitor	MyCancerGenome	-
CALCRL	DAVALINTIDE	agonist	ChemblInteractions	-
CALCRL	ALCOHOL	agonist	GuideToPharmacologyIntera-	-
CALCRL	CLOZAPINE	agonist	GuideToPharmacologyIntera-	-
CALCRL	CHEMBL756	agonist	GuideToPharmacologyIntera-	-
CALCRL	MONOETHANOLAMINE	antagonist	GuideToPharmacologyIntera-	-
CALCRL	OLCEGEPANT	antagonist	GuideToPharmacologyIntera-	-
CALCRL	TELCAGEPANT	antagonist	GuideToPharmacologyIntera-	-
CALCRL	ERENUMAB	antibody antagonist	GuideToPharmacologyIntera-	-
CALCRL	RIMEGEPANT	antagonist	ChemblInteractions	-
CALCRL	UBROGEPANT	antagonist	ChemblInteractions	-
CALCRL	MK3207	antagonist	ChemblInteractions	-
COL4A3	OCRIPLASMIN	-	ChemblInteractions	-
COL4A3	COLLAGENASE CLOSTRIDIUM HISTOLYTICUM	-	ChemblInteractions	-
COL6A3	OCRIPLASMIN	-	ChemblInteractions	-
COL6A3	COLLAGENASE CLOSTRIDIUM HISTOLYTICUM	-	ChemblInteractions	-
RARB	ADAPALENE	agonist	TdgClinicalTrial ChemblInte	9557255 9204085 11752352 9990413
RARB	ACITRETIN	agonist	ChemblInteractions DrugBa	11586072 7755585 19144697
RARB	ALITRETINOIN	agonist	ChemblInteractions TEND	16128742 16531051 16316409 19678713 16297713 16253547
RARB	TAZAROTENE	agonist	TdgClinicalTrial ChemblInte	18034539 12942109 9035701 15102095
RARB	ETRETINATE	agonist	ChemblInteractions NCI Dr	17001699 9298126 8301142
RARB	TAMBAROTENE	agonist	TdgClinicalTrial TEND Drug	17611697 15843826 17925887 15563242
RARB	TRETINOIN	agonist	ChemblInteractions NCI	17001699
RARB	ISOTRETINOIN	agonist	ChemblInteractions	-
RARB	MOFAROTENE	modulator	ChemblInteractions	-
RARB	IRX4310	antagonist	ChemblInteractions	-
RARB	CHEMBL275311	-	DrugBank	15546741 10592235
RARB	PALOVAROTENE	-	TdgClinicalTrial	-
RARB	FENRETINIDE	-	TdgClinicalTrial	-
COL6A6	OCRIPLASMIN	-	ChemblInteractions	-
COL6A6	COLLAGENASE CLOSTRIDIUM HISTOLYTICUM	-	ChemblInteractions	-
ATP8A1	DEXFOSFOSERINE	-	DrugBank	12697835 16179347 15971000 16618126
KLKB1	ECALLANTIDE	inhibitor	DrugBank TTD	18613770
KLKB1	CONESTAT ALFA	inhibitor Inhibitor	DrugBank	6184384

Gene	Drug	Interaction_types	Sources	PMIDs
F11	NONACOG ALFA	ligand	DrugBank	10593931 659613 11342438
F11	CHEMBL273653	inhibitor	GuideToPharmacologyInter-	-
F11	CONESTAT ALFA	inhibitor	DrugBank	16267649
F11	THROMBIN	-	NCI	9787166
F11	DEXTRAN SULFATE SODIUM	-	NCI	12968031
CSNK1A1	CHEMBL410456	inhibitor	GuideToPharmacologyInter-	-
CSNK1A1	IC261	inhibitor	GuideToPharmacologyInter-	-
CSNK1A1	HEPARIN	-	NCI	11243881
CACNA2D1	ISRADIPINE	inhibitor blocker	TdgClinicalTrial TEND DrugB	11752352 17139284 17016423
CACNA2D1	NISOLDIPINE	inhibitor	DrugBank	11752352
CACNA2D1	GABAPENTIN	inhibitor modulator	TdgClinicalTrial ChembInte	16899342 17067834 17982508 20588320 18299583
CACNA2D1	FELODIPINE	inhibitor	TdgClinicalTrial TEND DrugB	10525060 17475903 11752352
CACNA2D1	NITRENDIPINE	inhibitor blocker	DrugBank TTD	11752352
CACNA2D1	NIFEDIPINE	inhibitor blocker	TdgClinicalTrial TEND DrugB	16484345 11752352
CACNA2D1	CYCLANDELATE	inhibitor	DrugBank	10659603
CACNA2D1	NILVADIPINE	inhibitor	DrugBank	16484345 20933604 11752352
CACNA2D1	DILTIAZEM	blocker	TTD	-
CACNA2D1	AMLODIPINE	blocker	TdgClinicalTrial TTD	-
CACNA2D1	LERCANIDIPINE	blocker	TTD	-
CACNA2D1	BEPRIDIL HYDROCHLORIDE	blocker	ChembIntInteractions	-
CACNA2D1	GABAPENTIN ENACARBIL	modulator	TdgClinicalTrial ChembInte	-
CACNA2D1	PREGABALIN	modulator	ChembIntInteractions	-
CACNA2D1	MIROGABALIN BESYLATE	modulator	ChembIntInteractions	-
CACNA2D1	IMAGABALIN	modulator	ChembIntInteractions	-
CACNA2D1	ATAGABALIN	modulator	ChembIntInteractions	-
CACNA2D1	SAFINAMIDE	-	TdgClinicalTrial	-
CACNA2D1	CELECOXIB	-	PharmGKB	-
CACNA2D1	MAGNESIUM SULFATE	-	DrugBank	17139284 17016423
CACNA2D1	IBUTILIDE	-	TdgClinicalTrial TEND	-
NPC1L1	EZETIMIBE	inhibitor antagonist	TdgClinicalTrial GuideToPha	15679830 15928087 14976318 15737409 11752352 15992510
MGAM	ACARBOSE	inhibitor	TdgClinicalTrial TEND DrugB	19275550 16359900 16702880 11752352 16763908
MGAM	MIGLITOL	antagonist inhibitor	TdgClinicalTrial GuideToPha	9951949 11752352 19818342 16817895
MGAM	VOGLIBOSE	inhibitor	TdgClinicalTrial TEND DrugB	20351564 19568704 11752352 16713439 19281809 20025554
IDO1	TRYPTOPHAN	binder	TTD	-
IDO1	NORHARMANE	inhibitor	GuideToPharmacologyInter-	-
IDO1	EPACADOSTAT	inhibitor	GuideToPharmacologyInter-	-
IDO1	GLYMIDINE	inhibitor	GuideToPharmacologyInter-	-
IDO1	TRYPTANTHRIN	inhibitor	GuideToPharmacologyInter-	-
IDO1	CHEMBL584991	inhibitor	TTD	-
WEE1	AZD-1775	inhibitor	TALC TdgClinicalTrial Clear-	-
WEE1	CHEMBL462170	-	DrugBank	10592235
WEE1	GEMCITABINE	-	CIVIC	26057002
WEE1	PHENYLTHIOUREA	-	CIVIC	26057002
WEE1	CHEMBL512341	-	DrugBank	10592235
WEE1	CHEMBL214253	-	DrugBank	10592235
CYP3A7	COBICISTAT	inhibitor	ChembIntInteractions	-
CYP3A7	QUININE	-	NCI	9863152
CYP3A7	MELATONIN	-	NCI	11882353
CYP3A7	WARFARIN	-	NCI	3977899
CYP3A7	MICONAZOLE	-	NCI	3263862
CYP3A7	CORTISONE ACETATE	-	PharmGKB	-
CYP3A7	TESMLIFENE	-	TdgClinicalTrial	-
B3GAT1	CHONDROITIN SULFATE	-	NCI	12508223
B3GAT1	URIDINE_DIPHOSPHATE	-	DrugBank	17139284 17016423
ERBB3	MM-121	antagonist antibody	TALC MyCancerGenome Cle-	-
ERBB3	SERIBANTUMAB	antibody	GuideToPharmacologyInter-	-
ERBB3	SAPITINIB	inhibitor	GuideToPharmacologyInter-	-
ERBB3	DULIGOTUZUMAB	antibody	TALC MyCancerGenome	-
ERBB3	AV-203	antibody	TALC MyCancerGenome	-
ERBB3	OSIMERTINIB MESYLATE	inhibitor	ChembIntInteractions	-
ERBB3	DACOMITINIB	inhibitor	ChembIntInteractions MyCanc-	-
ERBB3	Patritumab	inhibitor	ChembIntInteractions	-
ERBB3	AMG-888	antibody	TALC MyCancerGenome	-
ERBB3	MOFLOTINIB	inhibitor	TALC	-
ERBB3	VANDETANIB	inhibitor	ChembIntInteractions	-
ERBB3	Pozotinib	inhibitor	ChembIntInteractions MyCanc-	-
ERBB3	GEFITINIB	inhibitor	CIVIC MyCancerGenome Clin	24685132
ERBB3	CIMAGLERMIN ALFA	-	TdgClinicalTrial	-
ERBB3	LAPATINIB	-	CGI CIVIC DoCM	23680147 25398453
ERBB3	RABEPRAZOLE	-	GuideToPharmacologyInter-	-
ERBB3	SPIRONOLACTONE	-	GuideToPharmacologyInter-	-
ERBB3	PERTUZUMAB	-	CGI CIVIC DoCM	23680147 26206558 25216528
ERBB3	AC-480	-	TdgClinicalTrial	-
ERBB3	CETUXIMAB	-	CIVIC	25520391
ERBB3	CP-724714	-	CIVIC	24685132
ERBB3	AFATINIB	-	OncoKB CGI CIVIC	27044931 24685132 23816960 18408761
ERBB3	SELMETINIB	-	CIVIC	24685132
ERBB3	TRASTUZUMAB	-	CGI DoCM	23680147
ERBB3	MARGETUXIMAB	-	ClarityFoundationClinicalTri-	-
DAOA	ARIPIPRAZOLE	-	PharmGKB	-
A2M	OCRIPLASMINE	ligand	DrugBank	-
A2M	THROMBIN	-	NCI	2432677
A2M	BECAPLERMIN	-	DrugBank	7541796 1697862
A2M	ALPROSTADIL	-	NCI	6202298
WARS	TRYPTOPHAN	inhibitor	DrugBank	17661345 16724112 17114500 17428498 17150540
WARS	CHEMBL227123	-	DrugBank	10592235
SLC12A3	BENDROFLUMETHIAZIDE	inhibitor blocker	TdgClinicalTrial ChembInte	10894798 18216144 11752352
SLC12A3	METOLAZONE	inhibitor blocker	TdgClinicalTrial GuideToPha	11752352
SLC12A3	BENZTHIAZIDE	inhibitor	TdgClinicalTrial ChembInte	17139284 17016423
SLC12A3	HYDROCHLOROTHIAZIDE	inhibitor blocker	TdgClinicalTrial GuideToPha	10894798 12772080 16078592 16172412 9038817 11752352 9596079
SLC12A3	DIAZOXIDE	unknown	TdgClinicalTrial TEND DrugB	17139284 17016423
SLC12A3	POLYTHIAZIDE	inhibitor blocker	TdgClinicalTrial ChembInte	10894798 12217863 11752352
SLC12A3	QUINETHAZONE	inhibitor	TdgClinicalTrial ChembInte	19474192 19636250 12538756 20528637
SLC12A3	CHLOROTHIAZIDE	inhibitor	TdgClinicalTrial GuideToPha	-
SLC12A3	CYCLOTHIAZIDE	inhibitor	GuideToPharmacologyInter-	-
SLC12A3	CHLOROTHIAZIDE SODIUM	inhibitor	ChembIntInteractions	-
SLC12A3	HYDROFLUMETHIAZIDE	inhibitor	ChembIntInteractions	-
SLC12A3	CHLOROTHALIDONE	inhibitor	ChembIntInteractions	-
SLC12A3	TRICHLORMETHIAZIDE	inhibitor	ChembIntInteractions	-

Gene	Drug	Interaction_types	Sources	PMIDs
SLC12A3	METHYLCLOTHIAZIDE	inhibitor	ChEMBLInteractions	-
SLC12A3	INDAPAMIDE	inhibitor	ChEMBLInteractions	-
PSMD8	CARFILZOMIB	inhibitor	MyCancerGenome ChEMBL	-
PSMD8	IXAZOMIB CITRATE	inhibitor	ChEMBLInteractions	-
PSMD8	BORTEZOMIB	inhibitor	MyCancerGenome ChEMBL	-
PSMD8	OPROZOMIB	inhibitor	ChEMBLInteractions	-
MED1	BECOCALCIDIOL	-	DrugBank	10592235
MTR	CYANOCOBALAMIN	cofactor	DrugBank	19904199 18709879
MTR	TETRAHYDROFOLATE	cofactor	DrugBank	9730838 11237340 11169015 9398303 10978155
MTR	METHIONINE	product of	DrugBank	17222188 16618098 17615995 16788729 17052662
MTR	HYDROXOCOBALAMIN	cofactor	DrugBank	18565 1744096 7599160 3812589 9587031
MTR	SULFASALAZINE	-	PharmGKB	-
MTR	VINCRIStINE	-	PharmGKB	-
MTR	FOLIC ACID	-	PharmGKB	-
MTR	CYCLOPHOSPHAMIDE	-	PharmGKB	-
MTR	DACTINOMYCIN	-	PharmGKB	-
WARS2	TRYPTOPHAN	inhibitor	DrugBank	16724112 17114825 16636268 16639024 17428498
LRP2	CARBOQUONE	-	PharmGKB	-
LRP2	INSULIN HUMAN	-	DrugBank	17139284 17016423
LRP2	UROKINASE	-	DrugBank	7959795 17139284 8241286 1280065 17016423
TACR3	ELEDOSIN	agonist	GuideToPharmacologyInter	-
TACR3	KASSININ	agonist	GuideToPharmacologyInter	-
TACR3	NEUROKININ A	agonist	GuideToPharmacologyInter	-
TACR3	NEUROKININ B	agonist	GuideToPharmacologyInter	-
TACR3	CHEMBL69367	agonist	GuideToPharmacologyInter	-
TACR3	SENKTIDE	agonist	GuideToPharmacologyInter	-
TACR3	SUBSTANCE P	agonist	GuideToPharmacologyInter	-
TACR3	ISOFLURANE	agonist	GuideToPharmacologyInter	-
TACR3	AZD2624	antagonist	GuideToPharmacologyInter	-
TACR3	CHEMBL480249	antagonist	GuideToPharmacologyInter	-
TACR3	CHEMBL221445	antagonist	GuideToPharmacologyInter	-
TACR3	OSANETANT	antagonist	GuideToPharmacologyInter	17172464
TACR3	CHEMBL44229	antagonist	GuideToPharmacologyInter	-
TACR3	SAREDUTANT	antagonist	GuideToPharmacologyInter	-
TACR3	CHEMBL9843	antagonist	GuideToPharmacologyInter	-
TACR3	CHEMBL1991816	antagonist	GuideToPharmacologyInter	-
TACR3	AMCINONIDE	antagonist	GuideToPharmacologyInter	-
TACR3	TALNETANT	antagonist	TdgClinicalTrial GuideToPha	-
TACR3	SB-222200	antagonist	TTD	-
TACR3	CHEMBL275544	antagonist	TTD	-
BRAF	BGB-283	inhibitor	CKB GuideToPharmacology	26208524
BRAF	CEP-32496	inhibitor	CKB GuideToPharmacology	22319199
BRAF	CHIR-265	inhibitor	MyCancerGenome TdgClinic	20538618 22351689
BRAF	DABRAFENIB	inhibitor	TALC MyCancerGenome Or	23020132 22608338 26619011 21483012 22351686 19001320 27659046 21156289 25370473 20368568 19884556 27797976 23846731 19255327 22048237 19561230 19010912 23549875 25024077 23489023 27255157 18541894 24586605 24508103 28268064 22773810 20132383300 23812671 25399551 24576830 25287827 23051966 19238210 20818844 24265153 23463675 23612012 25673644 23733758 28512244 23251002 26776917 22356324 20857202 22536370 22997239 21163703 15035987 23470635 21663470 24594804 27770002 22586120 20413299 23617957 25265494 26732095 22805292 19537845 14679157 8009 22663011 21975775 22038996 27283860 27500726 22448344 26287849 23621583 27523909 12068308 26811525 27048246 24163374 19773371 24354346 23325582 24583796 23031422 25265492 22735384 21683865 25370471 27697975 21639808 22281684 22649091 25466451 22241789 24570209 23918947 38 25989278 22389471 23934108 24888229 22180495 23524406 26392102 27577079 26678033 25089220 28784858 19018267 24388723 23845441 24885690 2014 26200454 23614898 25157968 20619739 12460919 24107445 12460918 28891408 27312529 21594703 8006 20350999 20630094 21426297 19404918 22743296 24396464 22972589 21129611 23406027 25656898 27080216 24265154 2015
BRAF	CHEMBL525191	inhibitor	CKB GuideToPharmacology	23549875 19276360
BRAF	CHEMBL373011	inhibitor	GuideToPharmacologyInter	-
BRAF	LY-3009120	inhibitor	CKB GuideToPharmacology	26343583 22798288 26732095
BRAF	PLX-4720	inhibitor	CKB GuideToPharmacology	20538618 26351322 24265153 21383288 23242808 27924459 19915144 24983357 18287029 27523909 26461489 22281684 27217440 10592235 23845441 26573800
BRAF	PLX-8394	inhibitor	CKB GuideToPharmacology	27834212 24422853
BRAF	REGORAFENIB	inhibitor	MyCancerGenome CKB Gui	21170960 23629272 25838391
BRAF	SB590885	inhibitor	CKB GuideToPharmacology	20538618 27523909
BRAF	SORAFENIB	inhibitor	MyCancerGenome TdgClinic	26619011 20538618 19001320 23629727 16609060 20586710 20812347 24727320 16901402 22310681 16880785 19537845 14679157 23792568 18186519 24422672 12068308 18794803 238900088 22394203 11752352 24885690 25157968 15466206 20619739 23152448 20350999 20332142 25662396 27388325 20526349 21129611 17575107
BRAF	VEMURAFENIB	inhibitor	TALC PharmGKB ClarityFo	26343583 23020132 22608338 26619011 21483012 22351686 28783719 24987354 19001320 21156289 20368568 19884556 23846731 19255327 22048237 19561230 19010912 24345920 23549875 25024077 22798288 23489023 23288408 18541894 24586605 24508103 22773810 23833300 23812671 25399551 24576830 21107323 25287827 23051966 19238210 20818844 24035431 24265153 26989536 23612012 23733758 26352686 23251002 25665005 26776917 25706985 231718 22356324 20857202 22536370 22997239 21163703 15035987 23470635 21663470 27760111 24594804 25939769 26343582 22586120 20413299 27460442 21383288 26267534 23617957 24265153 25265494 26732095 23715574 22805292 25515853 19537845 14679157 27297867 22663011 21975775 22038996 27500726 22448344 26287849 27523909 12068308 27048246 24163374 19773371 28514312 24354346 23325582 28649441 24583796 27196754 23031422 25265492 22735384 21683865 25370471 21639808 22281684 22649091 25466451 22241789 24570209 23918947 25989278 22389471 23934108 24888229 22180495 24283590 26582644 23524406 26678033 25089220 19018267 24388723 26918217 23845441 26200454 23614898 25157968 20619739 12460918 24107445 12460918 27312529 21594703 24997557 20350999 20630094 21426297 26137449 27048951 23094782 26603897 23365119 19404918 25589621 22621641 22743296 24396464 26460303 22972589 21129611 23406027 25656898 24523613 27080216 26984758

Gene	Drug	Interaction_types	Sources	PMIDs
BRAF	ENCORAFENIB	inhibitor	TALC MyCancerGenome On	19001320 19884556 27307593 28363909 23617957 22448344 28351928 20619739 27312529 26577700
BRAF	ARQ-736	inhibitor	TALC MyCancerGenome Ch	-
BRAF	RG-7256	inhibitor	MyCancerGenome Chembli	-
BRAF	XL-281	inhibitor	MyCancerGenome TdgClinic	-
BRAF	CHEMBL523411	inhibitor	TdgClinicalTrial ClarityFou	-
BRAF	DABRAFENIB MESYLATE	inhibitor	ChembliInteractions MyCan	-
BRAF	TEMSIROLIMUS	inhibitor	OncoKB CKB MyCancerGen	20586710 24422672 15466206 21216929 23152448 20332142 25662396
BRAF	MLN-2480	inhibitor	CKB ChembliInteractions M	-
BRAF	DASATINIB	inhibitor	CKB CGI DoCM MyCancerGenomeClinicalTrial	26619011 21483012 19010912 23833300 19238210 22310681 23242808 19537845 18186519 12068308 27222538 22649091 25157968 12460919 12460918 20350999 21129611
BRAF	SORAFENIB TOSYLATE	inhibitor	ChembliInteractions MyCan	-
BRAF	LGX-806	inhibitor	ChembliInteractions	-
BRAF	IMATINIB	-	CKB	27924459
BRAF	PILARALISIB (CHEMBL3218575)	-	CKB	25637314
BRAF	CHEMBL526479	-	DrugBank	10592235
BRAF	CHEMBL458997	-	CKB	26090892
BRAF	TIVOZANIB	-	CKB	26461489
BRAF	Ro-4987655	-	CKB	26438159
BRAF	E-6201	-	CKB	24448821 23039341
BRAF	PEMBROLIZUMAB	-	CKB FDA	26645196
BRAF	GSK-2636771	-	CKB	26577700 26645196
BRAF	VORINOSTAT	-	CKB	27924459
BRAF	PHENMETRAZINE	-	CKB	26137449
BRAF	NIVOLUMAB	-	FDA	-
BRAF	PA-799	-	CKB	21558396
BRAF	OMIPALISIB	-	CKB	22389471
BRAF	PIMASERTIB	-	ClarityFoundationBiomarke	23629727
BRAF	ARQ-092	-	CKB	26466992
BRAF	PANITUMUMAB	-	OncoKB CKB CGI CIViC Do	23020132 22608338 26619011 21483012 22351686 28783719 19001320 21156289 20368568 19884556 19255327 22048237 19561230 19010912 23549875 25024077 23489023 18541894 24586605 24508103 22773810 23833300 23812671 24576830 19238210 20818844 23612012 25673644 23251002 22356324 20857202 22536370 22997239 21163703 15035987 23470635 21663470 24594804 27770002 22586120 20413299 23617957 22805292 19537845 14679157 22663011 21975775 22038996 22448344 12068308 24163374 19773371 28514312 24354346 23325582 24583796 23031422 22735384 21683865 25370471 21639808 22281684 22649091 22241789 24570209 23918947 25989278 22389471 23934108 22180495 23524406 26678033 19018267 24388723 23845441 23614898 25157968 20619739 12460919 24107445 12460918 27312529 21594703 20350999 20360094 21426297 19404918 25589621 22743296 24396464 22972589 21129611 23406027
BRAF	TRAMETINIB	-	ClarityFoundationBiomarke	26343583 23020132 22608338 26619011 21483012 2493360 22351686 28783719 19001320 21156289 28344857 25370473 20368568 2797976 23846731 19255327 22048237 19561230 19010912 24354920 23549875 25024077 25309914 22798288 23489023 18541894 24586605 24508103 28268064 22773810 23833300 23812671 25399551 24576830 25287827 23051966 19238210 20818844 24265153 23612012 28512244 23251002 25665005 25706985 22356324 20857202 22536370 22997239 24727320 21163703 15035987 23470635 21663470 27760111 24594804 26343582 27770002 22586120 20413299 24265152 24933606 25265494 26732095 26469692 23715574 22805292 19537845 14679157 27297867 22663011 21488531 21975775 22038996 27338794 27283860 22169769 27500726 22448344 12068308 26811525 27048246 24163374 27222538 19773371 24354346 23325582 24583796 23031422 25265492 22735384 21683865 25370471 27697975 21639808 22281684 22649091 22241789 24570209 23918947 25989278 22389471 23934108 26314551 22180495 23524406 26392102 27577079 26678033 25089220 28784858 19018267 24388723 23845441 23614898 25157968 20619739 12460919 24107445 12460918 28891408 27312529 21594703 8006 20350999 26916115 20630094 21426297 20141835 19404918 23248257 22743296 26369631 24396464 22972589 20526349 21129611 23406027 25656898 24265154 2015
BRAF	SAR-260301	-	CKB	27196754
BRAF	IRINOTECAN	-	CKB CIViC	28783719 25714871 27729313
BRAF	CRIZOTINIB	-	CGI	-
BRAF	BINIMETINIB	-	ClarityFoundationBiomarke	19001320 19884556 27307593 23414587 28152546 23617957 22448344 20619739 26577700
BRAF	Ribociclib	-	CKB	28351928
BRAF	SELMETINIB	-	ClarityFoundationBiomarke	26343583 22197931 26324360 22048237 23942066 26351322 27655129 24265152 19915144 27222538 26461489 27196754 27217440 24448821 27312529 26137449 23406027
BRAF	NAVITOCCLAX	-	CKB	27659046 25665005 24983357
BRAF	UPROSERTIB	-	CKB	24265152
BRAF	MK-2206	-	CKB	24265152
BRAF	OBATOCLAX	-	CKB	22460902
BRAF	CEDIRANIB	-	CKB	26461489
BRAF	EVEROLIMUS	-	CKB	23629727 27797976 20664174 20664172 27217440
BRAF	DOXORUBICIN	-	CKB	27924459
BRAF	PICTILISIB	-	CKB CIViC	24265153 23845441 26577700 19276360
BRAF	CHEMBL2204502	-	CKB	22351686
BRAF	TAK-733	-	CKB CIViC	22798288 24398428 26439693
BRAF	COBIMETINIB	-	ClarityFoundationBiomarke	23020132 22608338 23846731 24508103 25399551 25287827 23051966 20818844 22084396 25265494 22663011 28649441 25265492 2735384 23918947 23934108 25089220
BRAF	VENETOCLAX	-	CKB	27974663
BRAF	Refametinib	-	CKB	19706763
BRAF	LENAVATINIB	-	CKB	26169970
BRAF	ALPELISIB	-	CKB CGI	27659046 28363909 27924459 27312529 26577700
BRAF	GANETESPIB	-	CKB	24398428 25077897
BRAF	FLUOROURACIL	-	CKB	27626067 26637369
BRAF	BUPARLISIB	-	CKB	27307593 24265152
BRAF	PALBOCICLIB	-	CKB	27488531 26369631
BRAF	CAPMATINIB	-	CKB	28783719

Gene	Drug	Interaction_types	Sources	PMIDs
BRAF	LEUCOVORIN	-	CKB	27626067
BRAF	LAPATINIB	-	CKB	21464044 23365119
BRAF	PF-04217903	-	CKB	27659046
BRAF	CHEMBL217354	-	CKB	25665005
BRAF	PANOBINOSTAT	-	CKB	21464044
BRAF	AFATINIB	-	CKB	26916115
BRAF	INK-128	-	CKB	26272063 25261369
BRAF	ZSTK-474	-	CKB	26137449
BRAF	CI-1040	-	CKB	20538618 19915144 19018267
BRAF	PACLITAXEL	-	OncoKB	26324360
BRAF	CETUXIMAB	-	OncoKB CKB CGI CIViC Do	23020132 22608338 26619011 21483012 22351686 28783719 19001320 21156289 20368568 19884556 19255327 22048237 19561230 19010912 23549875 25024077 23489023 18541894 24586605 24508103 22773810 23833300 23812671 24576830 19238210 20818844 23612012 23251002 25714871 22356324 20857202 28363909 22536370 22997239 21163703 15035987 23470635 21663470 24594804 22586120 20413299 23617957 22805292 19537845 14679157 26208524 22663011 21975775 22038996 22448344 26287849 12068308 24163374 19773371 24354346 23325582 24583796 23031422 22735384 22270724 21683865 25370471 21639808 22281684 25838391 22649091 22241789 24570209 23918947 25989278 22389471 23934108 2180495 23524406 26678033 19018267 24388723 23845441 2361498 25157968 27729313 20619739 12460919 24107445 12460918 27312529 21594703 20350999 26916115 20630094 21426297 27002107 19404918 22743296 24396464 22972589 21129611 23406027 24523613
BRAF	Voruciclib	-	CKB	-
BRAF	BI-2536	-	CKB	26573800
BRAF	ATEZOLIZUMAB	-	CKB	-
BRAF	PD-0325901	-	ClarityFoundationBiomark	26272063 26267534 27488531 16273091 26573800
BRAF	CHEMBL1231206	-	CKB	26140595
BRAF	LY-294002	-	CKB	23039341
BRAF	OXALUPLATIN	-	CKB	26637369
BRAF	DACTOLISIB	-	CKB CIViC	23549875 26137449
BRAF	TRASTUZUMAB	-	CKB	27626067
BRAF	GEDATOLISIB	-	CKB	24042735 17314276 21325073
BRAF	NERATINIB	-	CKB	26243863
BRAF	IDELALISIB	-	CKB	26137449
BRAF	AZD-6482	-	CKB	26577700
BRAF	BEVACIZUMAB	-	CKB	21216929
BRAF	PLX-3397	-	CKB	25939769
BRAF	AEW-541	-	CKB	26577700
BRAF	PF-0047736	-	CKB	26140595
BRAF	SARACATINIB	-	CKB	23242808
BRAF	GEFITINIB	-	CKB CIViC	23242808 22448344 22281684 27312529
BRAF	TUBASTATIN A	-	CKB	25957812
BRAF	ERLOTINIB	-	CKB	27659046 27924459 22448344
NRG3	ILOPERIDONE	-	PharmGKB	-
PIK3C2A	VOXTALISIB	inhibitor	MyCancerGenome	-
PIK3C2A	GEDATOLISIB	inhibitor	MyCancerGenome	-
PIK3C2A	COPANLISIB	inhibitor	MyCancerGenome	-
PIK3C2A	ALPELISIB	inhibitor	MyCancerGenome	-
PIK3C2A	PICTILISIB	inhibitor	MyCancerGenome	-
PIK3C2A	APITOLISIB	inhibitor	MyCancerGenome	-
PIK3C2A	GSK-2636771	inhibitor	MyCancerGenome	-
PIK3C2A	PF-04691502	inhibitor	MyCancerGenome	-
PIK3C2A	SF-1126	inhibitor	MyCancerGenome	-
PIK3C2A	PILARALISIB (CHEMBL3218575)	inhibitor	MyCancerGenome	-
PIK3C2A	QUERCETIN	inhibitor	MyCancerGenome	-
PIK3C2A	BUPARLISIB	inhibitor	MyCancerGenome	-
PIK3C2A	DACTOLISIB	inhibitor	MyCancerGenome	-
PIK3C2A	PI-103	inhibitor	MyCancerGenome	-
PIK3C2A	SONOLISIB	inhibitor	MyCancerGenome	-
NALCN	PYRIMETHAMINE	channel blocker	GuideToPharmacologyIntera	-
NALCN	COBALT (II) ION	channel blocker	GuideToPharmacologyIntera	-
NALCN	VERAPAMIL	channel blocker	GuideToPharmacologyIntera	-
PTK2B	LEFLUNOMIDE	antagonist	DrugBank	17103252 17604599 19149483
PTK2B	ALOISINE	inhibitor	GuideToPharmacologyIntera	-
PTK2B	CHEMBL458997	inhibitor	GuideToPharmacologyIntera	-
PTK2B	PF-562271	inhibitor	GuideToPharmacologyIntera	-
PTK2B	RUXOLITINIB PHOSPHATE	inhibitor	TTD	-
PTK2B	PIBOSEROD	inhibitor	TTD	-
PTK2B	DEFACITINIB	inhibitor	ChemblInteractions	-
PTK2B	CHEMBL509485	-	DrugBank	10592235
PTK2B	GENISTEIN	-	DrugBank	17139284 17016423
PPP1R13L	CARBOQUONE	-	PharmGKB	-
PPP1R13L	THALIDOMIDE	-	PharmGKB	-
PPP1R13L	CYCLOPHOSPHAMIDE	-	PharmGKB	-
PPP1R13L	PHENYLTHIOUREA	-	PharmGKB	-
SDF4	ALCOHOL	-	NCI	18355758
ITGB6	DI17E6	inhibitor	ChemblInteractions	-
ITGB6	STX-100	inhibitor	ChemblInteractions	-
ITGB6	INTETUMUMAB	antagonist	ChemblInteractions	-
NID1	UROKINASE	-	DrugBank	1499567 17139284 17016423
PDE11A	TADALAFIL	inhibitor	GuideToPharmacologyIntera	19641165 17696499
TEC	ACALABRUTINIB	inhibitor	GuideToPharmacologyIntera	-
TEC	IBRUTINIB	inhibitor	GuideToPharmacologyIntera	-
TEC	INOSITOL	-	NCI	9240435
SHH	TRETINOIN	-	NCI	10404648
SHH	CAFFEINE	-	NCI	15456933
SLC30A8	REPAGLINIDE	-	PharmGKB	-
PLAU	CHEMBL252937	inhibitor	GuideToPharmacologyIntera	-
PLAU	CHEMBL111576	inhibitor	GuideToPharmacologyIntera	-
PLAU	CHEMBL108468	inhibitor	TdgClinicalTrial GuideToPha	-
PLAU	AMEDIPLASE	activator	TTD	-
PLAU	ZOLEDRONIC ACID	-	NCI	11984068
PLAU	CHEMBL212616	-	DrugBank	17139284 17016423
PLAU	CHEMBL96433	-	DrugBank	10592235
PLAU	CHEMBL104937	-	DrugBank	10592235 17139284 17016423

PLAU	TRICHOSTATIN	-	NCI		12198113
PLAU	MIFEPRISTONE	-	NCI		11742418
PLAU	CHEMBL303992	-	DrugBank		10592235
PLAU	VERAPAMIL	-	NCI		9579573
PLAU	CHEMBL253608	-	DrugBank		10592235
PLAU	ALENDRONIC ACID	-	NCI		11984068
PLAU	CHEMBL321944	-	DrugBank	10592235 17139284 17016423	
PLAU	CHEMBL253825	-	DrugBank		10592235
PLAU	CHEMBL126589	-	DrugBank	17139284 17016423	
PLAU	NORDIHYDROGUAIARETIC ACID	-	NCI		2122915
PLAU	CHEMBL62897	-	DrugBank		10592235
PLAU	CHEMBL401365	-	DrugBank		10592235
PLAU	CHEMBL111575	-	DrugBank		10592235
PLAU	CHEMBL104166	-	DrugBank	17139284 17016423	
PLAU	RAZOXANE	-	NCI		9378540
PLAU	DACARBAZINE	-	NCI		9378540
PLAU	CARMUSTINE	-	NCI		9219734
PLAU	CHEMBL324168	-	DrugBank	10592235 17139284 17016423	
PLAU	IONOMYCIN	-	NCI		1701176
PLAU	MEDRONIC ACID	-	NCI		11984068
PLAU	CHEMBL109367	-	DrugBank	10592235 17139284 17016423	
PLAU	SIROLIMUS	-	NCI		11245436
PLAU	CHEMBL62836	-	DrugBank		10592235
PLAU	ANTIBIOTIC	-	NCI		12724357
PLAU	UROKINASE	-	TdgClinicalTrial DrugBank	12824001 12556741 12745435 12579271 12707394	
PLAU	ESTRADIOL	-	NCI	9662256 2492346	
PLAU	HYDROCORTISONE	-	NCI		2115769
PLAU	PAPAVERINE	-	NCI		16099300
PLAU	CELECOXIB	-	NCI		16172791
PLAU	GEFITINIB	-	NCI		16263158
PLAU	DEXTRAN SULFATE SODIUM	-	NCI		2465792
PLAU	AZACITIDINE	-	NCI		10209960
PLAU	RETINOL	-	NCI		1576255
PLAU	FILGRASTIM	-	NCI		16331631
PLAU	PICROTIIN	-	DrugBank	10592235 17139284 17016423	
PLAU	CALCIOTRIOL	-	NCI		3139763
PLAU	CHEMBL398428	-	DrugBank		10592235
PLAU	HERBIMYCIN	-	NCI		11245436
PLAU	(R)-MEXILETINE	-	DrugBank		10592235
PLAU	GELDANAMYCIN	-	NCI		12724357
PLAU	BENZAMIDINE	-	DrugBank	17139284 17016423	
PLAU	CHEMBL433501	-	DrugBank		10592235
PLAU	CHEMBL327715	-	DrugBank		10592235
PLAU	FIBRINOLYSIN, HUMAN	-	DrugBank		
PLAU	GONADOTROPIN, CHORIONIC	-	NCI	2506647 3121412	
PLAU	CHEMBL103043	-	DrugBank	10592235 17139284 17016423	
PLAU	CHEMBL1162174	-	DrugBank		10592235
IDE	PROTRIPTYLINE	inhibitor	GuideToPharmacologyIntera-		
IDE	TEPROTUMUMAB	inhibitor	GuideToPharmacologyIntera-		
IDE	INSULIN HUMAN	-	DrugBank	17139284 17016423	
TNFRSF1A	CYCLOPHOSPHAMIDE	-	NCI		9894568
SOAT2	HESPERETIN	inhibitor	DrugBank	10592235 17139284 17016423	
LRP1	NONACOG ALFA	-	DrugBank	1252212 17139284 17016423	
LRP1	TENECTEPLASE	-	DrugBank	16303771 8344937 1378833	
FOXO1	RIZATRIPTAN	-	NCI		12172378
TGFB3	FRESOLIMUMAB	inhibitor antibody	TALC ChemblInteractions		
TGFB3	DIOXANE	-	DrugBank	10592235 17139284 17016423	
PDK2	CHEMBL3186849	-	TdgClinicalTrial		
PDK2	CHEMBL316388	-	DrugBank		10592235
IL17RA	PARAMETHASONE	agonist	GuideToPharmacologyIntera-		
IL17RA	BRODALIMUMAB	antibody antagonist	GuideToPharmacologyIntera-		
HMOX1	BILIVERDIN	-	DrugBank	10592235 17139284 17016423	
HMOX1	SORAFENIB	-	CIVIC		26309414
HMOX1	FORMIC ACID	-	DrugBank	10592235 17139284 17016423	
HMOX1	ASPIRIN	-	NCI		12927812
HMOX1	ZINC CHLORIDE	-	NCI		9175711
HMOX1	SUNITINIB	-	CIVIC		26309414
HMOX1	CHEMBL1161866	-	DrugBank	12699699 17139284 17016423 12897089	
IL2RB	HUMAN INTERLEUKIN-2	modulator agonist	TdgClinicalTrial ChemblInte	16596189 16617454 16542139 11752352 16569767 16477002	
IL2RB	DENILEUKIN DIFTITOX	agonist binder	ChemblInteractions TEND E	18684057 17187516 11752352 15811959 16516670	
IL2RB	BASILIXIMAB	antibody inhibitor	ChemblInteractions DrugBa	10708100 12667677 12826150 10188761 11752352 11840795	
IL2RB	DACLIZUMAB	antibody inhibitor	ChemblInteractions DrugBa	15022409 2647626 15814281 12372041 11752352 2571203	
IL2RB	INOLIMOMAB	antagonist	TTD		
NFE2L2	WORTMANNIN	-	NCI		12391262
NFE2L2	TAMOXIFEN	-	NCI		18539158
NFE2L2	ALCOHOL	-	NCI		18759561
NFE2L2	ISOFLAVONE	-	NCI		16780800
NFE2L2	SIROLIMUS	-	NCI		17652445
NFE2L2	BROMOCRIPTINE	-	NCI		18455424
NFE2L2	CAPSAICIN	-	NCI		17979524
NFE2L2	FLUTAMIDE	-	NCI		16055512
NFE2L2	ASCORBATE	-	NCI		15050748
NFE2L2	LYCOPENE	-	NCI		18566994
NFE2L2	LITHIUM	-	NCI		18619545
NFE2L2	BLEOMYCIN (CHEMBL3039590)	-	NCI		15208274
NFE2L2	EPIGALOCATECHIN GALLATE	-	NCI		16950787
NFE2L2	DICUMAROL	-	NCI		12584558
NFE2L2	IONOMYCIN	-	NCI		15294043
NFE2L2	DEXAMETHASONE	-	NCI		15870285
NFE2L2	HYPERICIN	-	NCI		17219054
NFE2L2	SIMVASTATIN	-	NCI		17928392
NFE2L2	TRETINOIN	-	NCI		18048326
NFE2L2	STAUROSPORINE	-	NCI		11035812
NFE2L2	EPOETIN BETA	-	NCI		16707229
NFE2L2	PYRAZOLE	-	NCI		16374848
NFE2L2	INDOMETHACIN	-	NCI		11909699
NFE2L2	ROSIGLITAZONE	-	NCI		18302760
NFE2L2	DEFEROXAMINE	-	NCI		16950787

NFE2L2	DOXORUBICIN	-	NCI	18413364
NFE2L2	IROFULVEN	-	NCI	9195958
NFE2L2	DEXTRAN SULFATE SODIUM	-	NCI	17178849
NFE2L2	PHORBOL MYRISTATE ACETATE	-	NCI	11035812
ADCY2	COLFORSIN	-	DrugBank	10592235
RB1	PICTILISIB	-	CKB	27020857
RB1	RG-547	-	CKB	17121911
RB1	TRICHOSTATIN	-	CKB	18483379 23498719
RB1	LORLATINIB	-	CKB	28285684
RB1	Ribociclib	-	CKB	27542767 28151717 24795392
RB1	PALBOCICLIB	-	CKB CGI CIViC	27012813 22711607 20473330 27020857 26649278 27488531 20354191
RB1	TRAMETINIB	-	CKB	27488531
RB1	ENTINOSTAT	-	CKB	18483379 23498719
RB1	SIROLIMUS	-	CKB	21468343 23454836 1689463
RB1	INK-128	-	CKB	25261369
RB1	PREDNISOLONE	-	CKB	28151717
RB1	EVEROLIMUS	-	CKB	28151717
RB1	DEXAMETHASONE	-	CKB	28151717
RB1	ASPARAGINASE	-	CKB	28151717
RB1	VORINOSTAT	-	CKB	18483379 23498719
RB1	TRETINOIN	-	NCI	7521842
RB1	FOSTAMATINIB	-	CKB	22237022
RB1	TOPOTECAN	-	CKB	26826116
RB1	INSULIN HUMAN	-	DrugBank	17139284 17016423
RB1	MERCAPTOPYRINE	-	CKB	28151717
RB1	BORTEZOMIB	-	CKB	28151717
RB1	METHOTREXATE	-	CKB	28151717
KCNT2	FLUFENAMIC ACID	activator	GuideToPharmacologyIntera	-
KCNT2	NIFLUMIC ACID	activator	GuideToPharmacologyIntera	-
KCNT2	CLOFLIUM	channel blocker	GuideToPharmacologyIntera	-
KCNT2	CHEMBL116590	channel blocker	GuideToPharmacologyIntera	-
KCNT2	MEDRONIC ACID	-	PharmGKB	-
HLA-B	PAZOPANIB	-	FDA	-
HLA-B	ABACAIVIR	-	PharmGKB FDA	-
HLA-B	CARBAMAZEPINE	-	PharmGKB NCI FDA	16981842
HLA-B	OXCARBAZEPINE	-	FDA	-
HLA-B	PHENYTOIN	-	FDA	-
HLA-B	THALIDOMIDE	-	NCI	7876469
HTR5A	OLANZAPINE	antagonist	DrugBank	18308814
HTR5A	LOXAPINE	binder	DrugBank	-
HTR5A	SEROTONIN	agonist	GuideToPharmacologyIntera	-
HTR5A	8-OH-DPAT	agonist	GuideToPharmacologyIntera	-
HTR5A	DONITRIPTAN	agonist	GuideToPharmacologyIntera	-
HTR5A	CHEMBL267615	agonist	GuideToPharmacologyIntera	-
HTR5A	RU-24969	agonist	GuideToPharmacologyIntera	-
HTR5A	SUMATRIPTAN	agonist	GuideToPharmacologyIntera	-
HTR5A	CLOZAPINE	antagonist	GuideToPharmacologyIntera	-
HTR5A	ERGOTAMINE	antagonist	GuideToPharmacologyIntera	-
HTR5A	KETANSERIN	antagonist	GuideToPharmacologyIntera	-
HTR5A	METERGOLINE	antagonist	GuideToPharmacologyIntera	-
HTR5A	METITEPINE	antagonist	GuideToPharmacologyIntera	-
HTR5A	METHYSERGIDE	antagonist	GuideToPharmacologyIntera	-
HTR5A	CHEMBL7318	antagonist	GuideToPharmacologyIntera	-
HTR5A	PROPANOLOL	antagonist	GuideToPharmacologyIntera	-
HTR5A	RITANSERIN	antagonist	GuideToPharmacologyIntera	-
HTR5A	BUTANOIC ACID	antagonist	GuideToPharmacologyIntera	-
HTR5A	VORTIOXETINE	antagonist	GuideToPharmacologyIntera	-
HTR5A	YOHIMBINE	antagonist	GuideToPharmacologyIntera	-
HTR5A	ASENAPINE (CHEMBL3187365)	-	TdgClinicalTrial	-
PTK2	ENMD-2076	inhibitor	TdgClinicalTrial GuideToPha	-
PTK2	CHEMBL458997	inhibitor	GuideToPharmacologyIntera	10592235
PTK2	PF-562271	inhibitor	TALC GuideToPharmacology	-
PTK2	VS-4718	inhibitor	GuideToPharmacologyIntera	-
PTK2	MASITINIB	inhibitor	MyCancerGenome	-
PTK2	BI-853520	inhibitor	ChemblInteractions	-
PTK2	DEFACTINIB	inhibitor	TdgClinicalTrial ChemblInte	-
PTK2	CEP-37440	inhibitor	ChemblInteractions	-
PTK2	GSK-2256098	inhibitor	ChemblInteractions	-
PTK2	PHORBOL MYRISTATE ACETATE	-	NCI	10586059
PTK2	CHEMBL205098	-	DrugBank	10592235
ACADSB	ISOLEUCINE	-	DrugBank	16317551 16950638 15615815
ACADSB	VALPROIC ACID	-	TdgClinicalTrial	-
TCN1	HYDROXOCOBALAMIN	other	DrugBank	6726060 844253
TCN1	CYANOCOBALAMIN	-	NCI	2876185
TCN1	VITAMIN B12	-	NCI	526444 3018464 1285639 6164603 8438881 474643 1176445 10207776 3332101 2235967 1504859
SLC10A1	CYCLOSPORINE	inhibitor	GuideToPharmacologyIntera	-
SLC10A1	IRBESARTAN	inhibitor	GuideToPharmacologyIntera	-
SLC10A1	PROPRANOLOL	inhibitor	GuideToPharmacologyIntera	-
CTNNB1	CELECOXIB	-	PharmGKB	-
CTNNB1	TRAMETINIB	-	CKB	26343583
CTNNB1	VANTICTUMAB	-	CKB	22753465
CTNNB1	LETROZOLE	-	CGI	-
CTNNB1	UREA	-	DrugBank	10592235 17139284 17016423
CTNNB1	TRICIRIBINE	-	CKB	26224873
CTNNB1	TEMSIROLIMUS	-	CKB	27016228
CTNNB1	IMATINIB	-	CKB	26861905
CTNNB1	EVEROLIMUS	-	CGI	-
DSG1	CHEMBL35482	-	NCI	11781826
SLCO1B3	CYCLOSPORINE	inhibitor	GuideToPharmacologyIntera	-
SLCO1B3	GEMFIBROZIL	inhibitor	GuideToPharmacologyIntera	-
SLCO1B3	GLYCYRRHIZIN	inhibitor	GuideToPharmacologyIntera	-
SLCO1B3	RIFAMPICIN	inhibitor	GuideToPharmacologyIntera	12085361
SLCO1B3	SILDENAFIL	inhibitor	GuideToPharmacologyIntera	-
SLCO1B3	CLARTHROMYCIN	-	DrugBank	23571415
SLCO1B3	DOCEAXEL	-	PharmGKB	-
SLCO1B3	BROMOSULFOPHTHALEIN	-	GuideToPharmacologyIntera	-
SLCO1B3	MYCOPHENOLATE MOFETIL	-	PharmGKB	-
PTPRF	ILLUDALIC ACID	inhibitor	GuideToPharmacologyIntera	-

PTRF	ERLOTINIB HYDROCHLORIDE	-	CIVIC	26291013
FUBP1	IROFULVEN	-	DrugBank	-
COL24A1	COLLAGENASE CLOSTRIDIUM HISTOLYTICUM	-	ChemblInteractions	-
COL24A1	OCRIPLASMIN	-	ChemblInteractions	-
SCN9A	PHENACEMIDE	blocker	ChemblInteractions	-
SCN9A	PHENYTOIN SODIUM	blocker	ChemblInteractions	-
SCN9A	ETIDOCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	PHENYTOIN	blocker	ChemblInteractions	-
SCN9A	LIDOCAINE	blocker	TdgClinicalTrial ChemblInte	-
SCN9A	RG7893	blocker	ChemblInteractions	-
SCN9A	MERETHOXYLLINE PROCAINE	blocker	ChemblInteractions	-
SCN9A	CHLOROPROCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	ORPHENADRINE CITRATE	blocker	ChemblInteractions	-
SCN9A	RANOLAZINE	inhibitor blocker	TdgClinicalTrial DrugBank T	19077543 11752352
SCN9A	ZONISAMIDE	inhibitor blocker	TdgClinicalTrial ChemblInte	19557119 20001433 19948168 15511691 20025128 14704463 18433351
SCN9A	RUFINAMIDE	modulator blocker	ChemblInteractions DrugBa	23221868
SCN9A	VERATRIDINE	activator	GuideToPharmacologyIntera	-
SCN9A	LACOSAMIDE	channel blocker blocker	GuideToPharmacologyIntera	-
SCN9A	CHEMBL120768	channel blocker	GuideToPharmacologyIntera	-
SCN9A	PYRIMETHAMINE	channel blocker	GuideToPharmacologyIntera	-
SCN9A	SAXITOXIN	channel blocker	GuideToPharmacologyIntera	-
SCN9A	TETRODOTOXIN	channel blocker	TdgClinicalTrial GuideToPha	-
SCN9A	ESLICARBAZEPINE ACETATE	blocker	ChemblInteractions	-
SCN9A	QUINIDINE POLYGALACTURONATE	blocker	ChemblInteractions	-
SCN9A	MEXILETINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	RILUZOLE	blocker	ChemblInteractions	-
SCN9A	HEXYLCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	PRIMIDONE	blocker	ChemblInteractions	-
SCN9A	ETHOTOIN	blocker	ChemblInteractions	-
SCN9A	DISOPYRAMIDE PHOSPHATE	blocker	ChemblInteractions	-
SCN9A	DRONEDARONE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	DYCLONINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	QUINIDINE SULFATE	blocker	ChemblInteractions	-
SCN9A	PRILOCAINE	blocker	ChemblInteractions	-
SCN9A	TOPIRAMATE	blocker	ChemblInteractions	-
SCN9A	PROCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	MORICIZINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	PROPOXYCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	OXCARBAZEPINE	blocker	ChemblInteractions	-
SCN9A	FOSPHENYTOIN SODIUM	blocker	ChemblInteractions	-
SCN9A	LAMOTRIGINE	blocker	ChemblInteractions	-
SCN9A	LIDOCAINE HYDROCHLORIDE HYDRATE	blocker	ChemblInteractions	-
SCN9A	TOCAINIDE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	NW-3509	blocker	ChemblInteractions	-
SCN9A	AZD3161	blocker	ChemblInteractions	-
SCN9A	XEN403	blocker	ChemblInteractions	-
SCN9A	DSP-2230	blocker	ChemblInteractions	-
SCN9A	NKTR-171	blocker	ChemblInteractions	-
SCN9A	RG6029	blocker	ChemblInteractions	-
SCN9A	PF-05089771	blocker	ChemblInteractions	-
SCN9A	RAXATRIGINE	blocker	ChemblInteractions	-
SCN9A	NERISPIRDINE	blocker	ChemblInteractions	-
SCN9A	RALFINAMIDE	blocker	ChemblInteractions	-
SCN9A	TETRACAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	ESLICARBAZEPINE	blocker	ChemblInteractions	-
SCN9A	MEPIVACAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	PROCAINAMIDE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	MEPHENYTOIN	blocker	ChemblInteractions	-
SCN9A	ROPIVACAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	PROPARACAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	INDECAINIDE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	PHENAZOPYRIDINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	QUINIDINE GLUCONATE	blocker	ChemblInteractions	-
SCN9A	ORPHENADRINE (CHLORIDE)	blocker	ChemblInteractions	-
SCN9A	PRILOCAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	IRAMPANEL	blocker	ChemblInteractions	-
SCN9A	BENOXINATE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	ARTICAINE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	PROPAFENONE HYDROCHLORIDE	blocker	ChemblInteractions	-
SCN9A	TETRACAINE	blocker	ChemblInteractions	-
SCN9A	CARBAMAZEPINE	blocker	ChemblInteractions	-
SCN9A	SAFINAMIDE	-	TdgClinicalTrial	-
SCN9A	FUNAPIDE	-	TdgClinicalTrial	-
COL3A1	COLLAGENASE CLOSTRIDIUM HISTOLYTICUM	-	TdgClinicalTrial ChemblInte	2145268 17139284 17016423
COL3A1	OCRIPLASMIN	-	ChemblInteractions	-
RICTOR	AZD-8055	inhibitor	MyCancerGenome	-
RICTOR	OSI-027	inhibitor	MyCancerGenome	-
RICTOR	INK-128	inhibitor	MyCancerGenome	-
RICTOR	AZD-2014	-	CIVIC	28028034
NNT	CHEMBL1161866	-	DrugBank	17216441
NNT	CHEMBL1161862	-	DrugBank	10592235 17139284 17016423
FLOT1	CARBAMAZEPINE	-	PharmGKB	-
POR	TACROLIMUS	-	PharmGKB	-
POR	CHEMBL1161862	-	DrugBank	10592235 17139284 17016423
POR	MIDAZOLAM	-	PharmGKB	-
POR	FLAVIN ADENINE DINUCLEOTIDE	-	DrugBank	10592235 17139284 17016423
CNTRF	PHYSOSTIGMINE SULFATE	agonist	GuideToPharmacologyIntera	-
CNTRF	PRILOCAINE	agonist	GuideToPharmacologyIntera	-
CNTRF	RALOXIFENE	agonist	GuideToPharmacologyIntera	-
CNTRF	SCH-37370	agonist	TTD	-
SLT1	ETOPOSIDE	-	PharmGKB	-
MIRGPRX1	CHLOROQUINE	agonist	GuideToPharmacologyIntera	-
NEIL1	TROMETHAMINE	-	DrugBank	-
KARS	LYSINE	-	DrugBank	16953616 17560369 17425721 17158446
PAK5	GSK-690693	inhibitor	GuideToPharmacologyIntera	-
NR1H2	22(R)-HYDROXYCHOLESTEROL	agonist	GuideToPharmacologyIntera	-
NR1H2	24(S),25-EPOXYCHOLESTEROL	agonist	GuideToPharmacologyIntera	-
NR1H2	CHEMBL171804	agonist	GuideToPharmacologyIntera	-

NR1H2	PENTAZOCINE	agonist	GuideToPharmacologyIntera	-	-
NR1H2	DESMOSTEROL	agonist	GuideToPharmacologyIntera	-	-
NR1H2	CHEMBL59030	agonist	GuideToPharmacologyIntera	-	-
NR1H2	CHEMBL23296	agonist	GuideToPharmacologyIntera	-	-
NR1H2	T091317	agonist	GuideToPharmacologyIntera	-	10592235
NR1H2	CHEMBL493241	allosteric modulator	GuideToPharmacologyIntera	-	-
NR1H2	CHEMBL1093266	antagonist	GuideToPharmacologyIntera	-	-
NR1H2	BMS-779788	agonist	ChemblInteractions	-	-
NR1H2	BMS-852927	modulator	ChemblInteractions	-	-
NR1H2	LXR-623	agonist	ChemblInteractions	-	-
NR1H2	HVODEOXYCHOLIC_ACID	agonist	ChemblInteractions	-	-
NR1H2	CS-8080	agonist	ChemblInteractions	-	-
RBL1	HEXAMETHYLENEBISACETAMIDE	-	NCI	-	9205091
FCGR3A	GLOBULIN, IMMUNE	antagonist	DrugBank	20441428 17351760 17911465	-
FCGR3A	FENTANYL	-	NCI	-	11772808
FCGR3A	INFLIXIMAB	-	PharmGKB	-	-
FCGR3A	VINCRIStINE	-	PharmGKB	-	-
FCGR3A	EPOETIN ALFA	-	NCI	-	1300984
FCGR3A	CHONDROITIN SULFATE	-	NCI	-	18006074
FCGR3A	CIMETIDINE	-	NCI	-	11556524
FCGR3A	CYTARABINE	-	NCI	-	17852453
FCGR3A	PHORBOL MYRISTATE ACETATE	-	NCI	-	1827816
FCGR3A	PALIVIZUMAB	-	DrugBank	17139284 17016423	-
FCGR3A	PUROMYCIN	-	NCI	-	8423352
FCGR3A	TOSTIUMOMAB	-	DrugBank	17139284 17016423	-
FCGR3A	PREDNISOLONE	-	NCI	-	17329922
FCGR3A	GEMTUZUMAB OZOGAMICIN	-	DrugBank	7509291 17139284 17016423	-
FCGR3A	INDOMETHACIN	-	NCI	-	17329922
FCGR3A	MAFOSFAMIDE	-	NCI	-	1515095
FCGR3A	DIMETHYL SULFOXIDE	-	NCI	-	16896803
FCGR3A	DOXORUBICIN	-	NCI	-	1830717
FCGR3A	ADALIMUMAB	-	DrugBank	17139284 17016423	-
FCGR3A	EFALIZUMAB	-	DrugBank	17139284 17016423	-
FCGR3A	CETUXIMAB	-	PharmGKB NCI DrugBank	17139284 17704420 17016423	-
FCGR3A	PENICILLIN G POTASSIUM	-	NCI	-	17257217
FCGR3A	ALEMTUZUMAB	-	DrugBank	-	15217834
FCGR3A	CHEMBL411250	-	NCI	-	1827816
FCGR3A	BEVACIZUMAB	-	DrugBank	17139284 17016423	-
FCGR3A	RITUXIMAB	-	PharmGKB DrugBank	17324336 15448014 16609067	-
FCGR3A	LACTULOSE HYDRATE	-	NCI	-	1418064
FCGR3A	RIZATRIPTAN	-	NCI	-	10729215
FCGR3A	THALIDOMIDE	-	NCI	-	15457133
FCGR3A	SODIUM CHLORIDE	-	NCI	-	17187818
FCGR3A	DACLIZUMAB	-	DrugBank	17139284 17016423	-
FCGR3A	MUROMONAB-CD3	-	NCI DrugBank	11599102 17139284 17016423	-
FCGR3A	IBRITUMOMAB TIUXETAN	-	DrugBank	17139284 17016423	-
FCGR3A	BROMOACETIC ACID	-	NCI	-	1832500
FCGR3A	NATALIZUMAB	-	DrugBank	17139284 17016423	-
FCGR3A	TRASTUZUMAB	-	PharmGKB NCI DrugBank	18089830 17363544	-
FCGR3A	ABCIXIMAB	-	DrugBank	17139284 17016423	-
FCGR3A	CYCLOSPORINE	-	NCI	-	17852453
FCGR3A	BASILIXIMAB	-	DrugBank	17139284 17016423	-
FCGR3A	ETANERCEPT	-	DrugBank	15526004 15457442	-
FCGR3A	CYCLOPHOSPHAMIDE	-	PharmGKB	-	-
FCGR3A	ALEFACEPT	-	DrugBank	12795239 11970990 17139284 17016423	-
FCGR3A	HEPARIN	-	NCI	-	18492254
FCGR3A	PENICILLIN G SODIUM	-	NCI	-	1371977
FCGR3A	TESMLIFENE HYDROCHLORIDE	-	NCI	-	11556524
FCGR3A	GELDANAMYCIN	-	NCI	-	7662976
FCGR3A	HYDROGEN PEROXIDE	-	NCI	-	2138680
DTYMK	THYMIDINE MONOPHOSPHATE	-	DrugBank	10592235 17139284 17016423	-
DTYMK	ALCOHOL	-	NCI	-	11923581
DTYMK	CHEMBL1160619	-	DrugBank	10592235 17139284 17016423	-
DTYMK	CHEMBL1236157	-	DrugBank	10592235 17139284 17016423	-
DTYMK	CHEMBL1229914	-	DrugBank	17139284 17016423	-
DTYMK	CHEMBL1160597	-	DrugBank	17139284 17016423	-
DTYMK	CHEMBL1230989	-	DrugBank	17139284 17016423	-
DTYMK	AZIDOTHYMIDINE MONOPHOSPHATE	-	DrugBank	10592235 17139284 17016423	-
DTYMK	STAVUDINE	-	NCI	-	15134538
DTYMK	FLUOROURACIL	-	NCI	-	15067352
HTR1E	ELETRIPTAN	agonist	GuideToPharmacologyIntera	17139284 17016423	-
HTR1E	METHYSERGIDE	binder antagonist	GuideToPharmacologyIntera	-	8380639
HTR1E	OLANZAPINE	antagonist agonist	TdgClinicalTrial GuideToPha	-	17848919
HTR1E	CLOZAPINE	antagonist agonist	GuideToPharmacologyIntera	-	17848919
HTR1E	LOXAPINE	binder	DrugBank	-	-
HTR1E	ARIPIPIRAZOLE	antagonist	DrugBank	-	17848919
HTR1E	CHEMBL266591	agonist	GuideToPharmacologyIntera	-	-
HTR1E	CHEMBL275628	agonist	GuideToPharmacologyIntera	-	-
HTR1E	SEROTONIN	agonist	GuideToPharmacologyIntera	-	-
HTR1E	5-MEO-DMT	agonist	GuideToPharmacologyIntera	-	-
HTR1E	5-METHOXYTRYPTAMINE	agonist	GuideToPharmacologyIntera	-	-
HTR1E	8-OH-DPAT	agonist	GuideToPharmacologyIntera	-	-
HTR1E	ASENAPINE (CHEMBL3187365)	agonist	GuideToPharmacologyIntera	-	-
HTR1E	CHEMBL1256797	agonist	GuideToPharmacologyIntera	-	-
HTR1E	DIHYDROERGOTAMINE	agonist	GuideToPharmacologyIntera	-	-
HTR1E	DONITRIPTAN	agonist	GuideToPharmacologyIntera	-	-
HTR1E	CHEMBL267615	agonist	GuideToPharmacologyIntera	-	-
HTR1E	ERGONOVINE	agonist	GuideToPharmacologyIntera	-	-
HTR1E	ERGOTAMINE	agonist	GuideToPharmacologyIntera	-	-
HTR1E	CHEMBL3186179	agonist	GuideToPharmacologyIntera	-	-
HTR1E	LYSERGOL	agonist	GuideToPharmacologyIntera	-	-
HTR1E	NARATRIPTAN	agonist	GuideToPharmacologyIntera	-	-
HTR1E	QUETIAPINE	agonist	GuideToPharmacologyIntera	-	-
HTR1E	RIZATRIPTAN	agonist	GuideToPharmacologyIntera	-	-
HTR1E	SUMATRIPTAN	agonist	GuideToPharmacologyIntera	-	-
HTR1E	TRYPTAMINE	agonist	GuideToPharmacologyIntera	-	-
HTR1E	XANOMELINE	agonist	GuideToPharmacologyIntera	-	-
HTR1E	ZIPRASIDONE	agonist	GuideToPharmacologyIntera	-	-
HTR1E	ZOLMITRIPTAN	agonist	GuideToPharmacologyIntera	-	-

HTR1E	BRL-15,572	agonist	GuideToPharmacologyIntera	-	
HTR1E	GR-127935	agonist	GuideToPharmacologyIntera	-	
HTR1E	CHLOROPHENYLPYPERAZINE	agonist	GuideToPharmacologyIntera	-	
HTR1E	CHEMBL277120	antagonist	GuideToPharmacologyIntera	-	
HTR1E	PALUPERIDONE	antagonist	GuideToPharmacologyIntera	-	
HTR1E	FLUSPIRILENE	antagonist	GuideToPharmacologyIntera	-	
HTR1E	METERGOLINE	antagonist	GuideToPharmacologyIntera	-	
HTR1E	MEITTEPINE	antagonist	GuideToPharmacologyIntera	-	
HTR1E	METHYLERGONOVINE	antagonist	GuideToPharmacologyIntera	-	
HTR1E	RAUWOLSCINE	antagonist	GuideToPharmacologyIntera	-	
HTR1E	RISPERIDONE	antagonist	GuideToPharmacologyIntera	-	
HTR1E	SERTINDOLE	antagonist	GuideToPharmacologyIntera	-	
HTR1E	YOHIMBINE	antagonist	GuideToPharmacologyIntera	-	
HTR1E	ZOTEPINE	antagonist	GuideToPharmacologyIntera	-	
KMT2D	BICALUTAMIDE	-	CGI	-	
COL1A2	OCRIPLASMIN	-	ChemblInteractions	-	
COL1A2	STAUROSPORINE	-	NCI	-	12393755
COL1A2	COLLAGENASE CLOSTRIDIUM HISTOLYTICUM	-	TdgClinicalTrial ChemblInte	-	12101112
EPHB6	VANDETANIB	inhibitor	ChemblInteractions	-	
GNAI1	CHEMBL384759	-	DrugBank	10592235 17139284 17016423	
SLC2A1	DIAZEPAM	-	NCI	-	15148255
SLC2A1	TRIAMCINOLONE	-	NCI	-	10199793
SLC2A1	ESTRADIOL	-	NCI	-	9227446
SLC2A1	THYMIDINE	-	NCI	-	1868466
SLC2A1	TRETINOIN	-	NCI	-	10950817
SLC2A1	ROSLIGLITAZONE	-	NCI	-	11699047
SLC2A1	PIOGLITAZONE	-	NCI	-	17251278
SLC2A1	QUAZEPAM	-	NCI	-	17023582
SLC2A1	GLUFOSFAMIDE	-	TdgClinicalTrial	-	
SLC2A1	GENTAMICIN	-	NCI	-	8779884
SLC2A1	PHENYTOIN	-	NCI	-	15698863
SLC2A1	GENISTEIN	-	NCI	-	8621505
SLC2A1	PROGESTERONE	-	NCI	-	15350188
IPO13	ENMD-981693	-	TdgClinicalTrial	-	
NOS1AP	DOLASETRON	-	PharmGKB	-	
NOS1AP	VERAPAMIL	-	PharmGKB	-	
APOB	FENOFIBRATE	-	NCI	-	12606523
APOB	CHOLESTYRAMINE	-	NCI	-	3906004
APOB	ALCOHOL	-	NCI	-	8576634
APOB	VITAMIN E	-	NCI	-	7649489
APOB	NEVIRAPINE	-	NCI	-	12869587
APOB	QUERCETIN	-	NCI	-	16149735
APOB	EPIGALOCATECHIN GALLATE	-	NCI	-	11936850
APOB	IRBESARTAN	-	PharmGKB	-	
APOB	MIPOMERSEN	-	TdgClinicalTrial	-	
APOB	LOVASTATIN	-	NCI	2351867 7662319 1588827	
APOB	PRAVASTATIN	-	NCI	-	8312689
APOB	HEPARIN	-	NCI	9521691 2457642	
APOB	TRIFLUOPERAZINE	-	NCI	-	7595077
APOB	DEXAMETHASONE	-	NCI	-	7670964
APOB	ATORVASTATIN	-	NCI	11882317 12119202 9598838 15864114 10357840 12562847 10531660 15353498 12145148	
APOB	CHONDROITIN SULFATE	-	NCI	-	9409221
APOB	HYDROCORTISONE	-	NCI	-	1597147
KCNG3	TEDISAMIL	blocker	ChemblInteractions	-	
KCNG3	GUANIDINE HYDROCHLORIDE	blocker	ChemblInteractions	-	
KCNG3	NERISPIRIDINE	blocker	ChemblInteractions	-	
KCNG3	DALFAMPRIDINE	blocker	ChemblInteractions	-	
TUBA3D	IXABEPILONE	inhibitor	ChemblInteractions	-	
TUBA3D	CROLIBULIN	inhibitor	ChemblInteractions	-	
TUBA3D	PLINABULIN	inhibitor	ChemblInteractions	-	
TUBA3D	TRASTUZUMAB EMTANSINE	inhibitor	ChemblInteractions	-	
TUBA3D	BRENTUXIMAB VEDOTIN	inhibitor	ChemblInteractions	-	
TUBA3D	DOCETAXEL HYDRATE	inhibitor	ChemblInteractions	-	
TUBA3D	ERIBULIN MESYLATE	inhibitor	ChemblInteractions	-	
TUBA3D	CABAZITAXEL	inhibitor	ChemblInteractions	-	
TUBA3D	COLCHICINE	inhibitor	ChemblInteractions	-	
TUBA3D	PACLITAXEL	inhibitor	ChemblInteractions	-	
TUBA3D	FOSBRETABULIN DISODIUM	inhibitor	ChemblInteractions	-	
TUBA3D	VINCISTINE SULFATE	inhibitor	ChemblInteractions	-	
TUBA3D	VINORELBIN DITARTRATE	inhibitor	ChemblInteractions	-	
TUBA3D	VINBLASTINE SULFATE	inhibitor	ChemblInteractions	-	
TUBA3D	LEXIBULIN	inhibitor	ChemblInteractions	-	
TUBA3D	VINFUNLINE	inhibitor	ChemblInteractions	-	
TUBA3D	INDIBULIN	inhibitor	ChemblInteractions	-	
TUBA3D	FOSBRETABULIN TROMETHAMINE	-	ChemblInteractions	-	
TUBA3D	SAGOPILONE	-	ChemblInteractions	-	
TUBA3D	VERUBULIN	-	ChemblInteractions	-	
TUBA3D	PACLITAXEL POLIGLUMEX	-	ChemblInteractions	-	
TUBA3D	DAVUNETIDE	-	ChemblInteractions	-	
SLC19A3	CYSTEINE	-	DrugBank	17139284 17016423	
CAMP	SELENOCYSTEINE	-	DrugBank	10592235 17139284 17016423	
IGSF10	PYRIDOXAL PHOSPHATE	cofactor	DrugBank	10592235 17139284 17016423	
GABRG1	TEMAZEPAM	potentiator positive allosteric modulator	TdgClinicalTrial ChemblInte	18384456 20138190	
GABRG1	ADINAZOLAM	potentiator	TdgClinicalTrial TEND Drug	6148400 6320036	
GABRG1	HALAZEPAM	potentiator positive allosteric modulator	TdgClinicalTrial ChemblInte	6738302 2867566	
GABRG1	DIAZEPAM	potentiator positive allosteric modulator	TdgClinicalTrial ChemblInte	18384456 11752090	
GABRG1	OXAZEPAM	potentiator positive allosteric modulator	TdgClinicalTrial ChemblInte	18384456 11752090	
GABRG1	TRIAZOLAM	potentiator positive allosteric modulator	TdgClinicalTrial ChemblInte	18384456 11752090	
GABRG1	ESTAZOLAM	potentiator positive allosteric modulator	TdgClinicalTrial ChemblInte	639854 2889803	
GABRG1	BROMAZEPAM	potentiator	TdgClinicalTrial TEND Drug	-	18384456
GABRG1	CLOTAZEPAM	potentiator	TdgClinicalTrial TEND Drug	18855614 18604239	
GABRG1	FLUDIAZEPAM	potentiator	TdgClinicalTrial TEND Drug	-	2857046
GABRG1	KETAZOLAM	potentiator	DrugBank	18384456 11752090	
GABRG1	PRAZEPAM	potentiator positive allosteric modulator	TdgClinicalTrial ChemblInte	-	7773620
GABRG1	QUAZEPAM	potentiator positive allosteric modulator	TdgClinicalTrial ChemblInte	3017690 2892106	
GABRG1	CINOLAZEPAM	potentiator	TdgClinicalTrial TEND Drug	-	7849137

GABRG1	NITRAZEPAM	potentiator	TdgClinicalTrial TEND DrugBank	18384456 11752090	
GABRG1	CLORAZEPATE DIPOTASSIUM	positive allosteric modulator	ChemblInteractions	-	
GABRG1	CHLORDIAZEPOXIDE	positive allosteric modulator	TdgClinicalTrial ChemblInte	-	
GABRG1	ESZOPICLONE	positive allosteric modulator	ChemblInteractions	-	
GABRG1	MEPROBAMATE	agonist	ChemblInteractions	-	
GABRG1	CLOBAZAM	positive allosteric modulator	TdgClinicalTrial ChemblInte	-	
GABRG1	ALPRAZOLAM	positive allosteric modulator	TdgClinicalTrial ChemblInte	-	
GABRG1	BUTALBITAL	positive allosteric modulator	ChemblInteractions	-	
GABRG1	CLONAZEPAM	positive allosteric modulator	ChemblInteractions TEND	-	
GABRG1	DESFLURANE	positive allosteric modulator	ChemblInteractions	-	
GABRG1	TALBUTAL	positive allosteric modulator	ChemblInteractions	-	
GABRG1	BUTABARBITAL SODIUM	positive allosteric modulator	ChemblInteractions	-	
GABRG1	LORAZEPAM	positive allosteric modulator	TdgClinicalTrial ChemblInte	-	
GABRG1	METHARBITAL	positive allosteric modulator	ChemblInteractions	-	
GABRG1	METHYRPLYON	positive allosteric modulator	ChemblInteractions	-	
GABRG1	MIDAZOLAM HYDROCHLORIDE	positive allosteric modulator	ChemblInteractions	-	
GABRG1	PRIMIDONE	positive allosteric modulator	ChemblInteractions	-	
GABRG1	PROPOFOL	positive allosteric modulator	ChemblInteractions	-	
GABRG1	PENBARBITAL SODIUM	positive allosteric modulator	ChemblInteractions	-	
GABRG1	SECOBARBITAL SODIUM	positive allosteric modulator	ChemblInteractions	-	
GABRG1	SEVOFLURANE	positive allosteric modulator	ChemblInteractions	-	
GABRG1	THIAMYLA SODIUM	positive allosteric modulator	ChemblInteractions	-	
GABRG1	FLURAZEPAM HYDROCHLORIDE	positive allosteric modulator	ChemblInteractions	-	
GABRG1	HALOTHANE	positive allosteric modulator	ChemblInteractions	-	
GABRG1	ISOFLURANE	positive allosteric modulator	ChemblInteractions	-	
GABRG1	ADIPILON	partial agonist	TdgClinicalTrial ChemblInte	-	
GABRG1	Loretdiplon	positive allosteric modulator	ChemblInteractions	-	
GABRG1	RESEQUINIL	inverse agonist	ChemblInteractions	-	
GABRG1	PF-06372865	agonist	ChemblInteractions	-	
GABRG1	METHOHEXITAL SODIUM	positive allosteric modulator	ChemblInteractions	-	
GABRG1	THIOPENTAL SODIUM	positive allosteric modulator	ChemblInteractions	-	
GABRG1	CHLORDIAZEPOXIDE HYDROCHLORIDE	positive allosteric modulator	ChemblInteractions	-	
GABRG1	PENBARBITAL	positive allosteric modulator	ChemblInteractions	-	
GABRG1	METHOXYFLURANE	-	ChemblInteractions	-	
GABRG1	MIDAZOLAM	-	TdgClinicalTrial TEND	-	
GABRG1	ETOMIDATE	-	ChemblInteractions	-	
GABRG1	ETHCHLORVYNOL	-	ChemblInteractions	-	
GABRG1	GLUTETHIMIDE	-	ChemblInteractions	-	
GABRG1	TOPIRAMATE	-	ChemblInteractions	-	
GABRG1	GABOXADOL	-	TdgClinicalTrial	-	
GABRG1	OCINAPILON	-	TdgClinicalTrial	-	
GABRG1	ENFLURANE	-	ChemblInteractions	-	
GABRG1	CLORAZEPIC ACID	-	TdgClinicalTrial TEND	-	
GABRG1	ACAMPROSATE CALCIUM	-	ChemblInteractions	-	
GABRG1	FLUMAZENIL	-	ChemblInteractions	-	
GABRG1	TRICLOFOS SODIUM	-	ChemblInteractions	-	
GABRG1	FLURAZEPAM	-	TdgClinicalTrial TEND	-	
GABRG1	ETAZOLATE	-	TdgClinicalTrial	-	
ANXA3	NAPHTHALENE	agonist	GuideToPharmacologyIntera	-	
ANXA3	CHEMBL435278	agonist	GuideToPharmacologyIntera	-	
ANXA3	CHEMBL122264	agonist	GuideToPharmacologyIntera	-	
ANXA3	CHEMBL17639	agonist	GuideToPharmacologyIntera	-	
ANXA3	CHEMBL21283	antagonist	GuideToPharmacologyIntera	-	
ANXA3	MONOETHANOLAMINE	-	DrugBank	-	
FBXW7	SIROLIMUS	-	CKB CGI CIVIC	24586741 18787170 23558291	
FBXW7	CHEMBL191482	-	CKB		23274910
FBXW7	ENTINOSTAT	-	CKB		23274910
FBXW7	REGORAFENIB	-	CKB		27399335
FBXW7	DOCEAXEL	-	CKB		23274910
FBXW7	BELINOSTAT	-	CKB		23274910
FBXW7	VORINOSTAT	-	CKB		23274910
FBXW7	TEMSIROLIMUS	-	CKB		24360397
FGB	Sucralfate	antagonist	DrugBank		6892775
FGB	FIBRINOLYSIN, HUMAN	inhibitor	ChemblInteractions	-	
FGB	ALFIMEPRASE	-	TdgClinicalTrial DrugBank		1696922
FGB	TIROFIBAN	-	PharmGKB	-	
FGB	ABCIXIMAB	-	PharmGKB	-	
FGB	EPTIFIBATIDE	-	PharmGKB	-	
PIK3R1	PF-04691502	inhibitor	ClarityFoundationBiomarke	-	
PIK3R1	Puquitinib	inhibitor	ChemblInteractions	-	
PIK3R1	PA-799	inhibitor	ChemblInteractions	-	
PIK3R1	ISOPRENALINE	agonist	DrugBank	15110780 15618457 15985706 15381832 15527548	
PIK3R1	GSK-2636771	inhibitor	MyCancerGenome	-	
PIK3R1	DS-7423	inhibitor	ClarityFoundationBiomarke	-	
PIK3R1	OMIPALISIB	inhibitor	ClarityFoundationBiomarke	-	
PIK3R1	RECIUSIB	inhibitor	ChemblInteractions	-	
PIK3R1	PWT-33587	inhibitor	ChemblInteractions	-	
PIK3R1	RG-7666	inhibitor	ChemblInteractions	-	
PIK3R1	SF-1126	inhibitor	MyCancerGenome Chembl	-	
PIK3R1	VS-5584	inhibitor	ChemblInteractions	-	
PIK3R1	COPANLISIB	inhibitor	ClarityFoundationBiomarke	-	
PIK3R1	GEDATOLISIB	inhibitor	ClarityFoundationBiomarke	-	
PIK3R1	SONOLISIB	inhibitor	MyCancerGenome Chembl	-	
PIK3R1	APITOLISIB	inhibitor	MyCancerGenome Chembl	-	
PIK3R1	TASELISIB	inhibitor	ChemblInteractions	-	
PIK3R1	PILARALISIB (CHEMBL3360203)	inhibitor	ChemblInteractions	-	
PIK3R1	VOXTALISIB	inhibitor	ClarityFoundationBiomarke	-	
PIK3R1	ZSTK-474	inhibitor	ClarityFoundationBiomarke	-	
PIK3R1	ALPELISIB	inhibitor	ClarityFoundationBiomarke	-	
PIK3R1	PI-103	inhibitor	MyCancerGenome	-	
PIK3R1	QUERCETIN	inhibitor	MyCancerGenome	-	
PIK3R1	PILARALISIB (CHEMBL3218575)	inhibitor	MyCancerGenome	-	
PIK3R1	WX-037	inhibitor	ChemblInteractions	-	
PIK3R1	BGT-226 (CHEMBL3545096)	inhibitor	ChemblInteractions	-	
PIK3R1	PICTILISIB	inhibitor	MyCancerGenome Chembl	-	
PIK3R1	BUPARLISIB	inhibitor	MyCancerGenome Chembl	-	
PIK3R1	DACTOLISIB	inhibitor	ClarityFoundationBiomarke	-	
PIK3R1	Panulisib	inhibitor	ChemblInteractions	-	
PIK3R1	GSK-1059615	inhibitor	ChemblInteractions	-	

PIK3R1	AZD-6482	inhibitor	ChemblInteractions	-	
PIK3R1	BUPARLISIB HYDROCHLORIDE	inhibitor	MyCancerGenomeClinicalTrials	-	
PIK3R1	LY-3023414	inhibitor	ChemblInteractions	-	
PIK3R1	WORTMANNIN	-	DrugBank		10592235
KCNN2	MICONAZOLE	inhibitor	DrugBank	1376313 8760033	
KCNN2	CA2	activator	GuideToPharmacologyInteractions	-	
KCNN2	CHEMBL453730	activator	GuideToPharmacologyInteractions	-	
KCNN2	CHEMBL1255655	activator	GuideToPharmacologyInteractions	-	
KCNN2	CHEMBL452887	activator	GuideToPharmacologyInteractions	-	
KCNN2	CHEMBL499968	activator	GuideToPharmacologyInteractions	-	
KCNN2	CHEMBL1709719	activator	GuideToPharmacologyInteractions	-	
KCNN2	BENDROFLUMETHIAZIDE	channel blocker	GuideToPharmacologyInteractions	-	
KCNN2	TUBOCURARINE	channel blocker	GuideToPharmacologyInteractions	-	
KCNN2	CHEMBL510780	gating inhibitor	GuideToPharmacologyInteractions	-	
KCNN2	APAMIN	inhibitor	GuideToPharmacologyInteractions	-	
ALDH7A1	CHEMBL1161866	-	DrugBank	9355735 17139284 17016423	
SLC23A1	PHLORETIN	inhibitor	GuideToPharmacologyInteractions	-	
SLC23A1	ASCORBATE	-	DrugBank	17645691 17541511 17008880 17664139 17258485	
TFAP2A	AMPRENAVIR	-	NCI		10996400
TFAP2A	INDINAVIR	-	NCI		10996400
TFAP2A	STAUROSPORINE	-	NCI		11438643
TFAP2A	NELFINAVIR	-	NCI		10996400
NTSE	PENTOXIFYLLINE	inhibitor	DrugBank	16426349 11752352	
NTSE	ROLIPRAM	inhibitor	GuideToPharmacologyInteractions	-	
NTSE	INOSITOL	-	NCI		2847980
NTSE	VESNARINONE	-	NCI		9133521
NTSE	RESERPINE	-	NCI		10700389
NTSE	CLOZAPINE	-	NCI		11490180
NTSE	CETUXIMAB	-	CIVIC		25520391
NTSE	DOXORUBICIN	-	NCI		7927909
NTSE	BROMOACETIC ACID	-	NCI		1557611
NTSE	CAPSAICIN	-	NCI		2492344
NTSE	DIAZOXIDE	-	NCI		16271703
NTSE	TINIDAZOLE	-	NCI		14553936
NTSE	RAVIDASVIR	-	NCI		8348695
NTSE	LOVASTATIN	-	NCI		11884371
NTSE	HALOPERIDOL	-	NCI		11490180
NTSE	SULFASALAZINE	-	NCI		9435300
NTSE	EPOETIN BETA	-	NCI		16468051
EPHA7	VANDETANIB	inhibitor	ChemblInteractions	-	
EPHA7	CHEMBL552425	-	DrugBank		10592235
LAMA2	OCRIPLASMIN	-	ChemblInteractions	-	
LPA	AMINOCAPROIC ACID	other	DrugBank	17139284 17016423 15287725	
PLOD3	SUCCINIC ACID	-	DrugBank	17139284 17016423	
PLOD3	ASCORBATE	-	DrugBank	17139284 17016423	
MET	ARRY-300	inhibitor	ChemblInteractions	-	
MET	BMS-698769	inhibitor	ChemblInteractions	-	
MET	BMS-777607	inhibitor	TALC MyCancerGenome CKB GuideToPharmacology	22286523 20515943 28396313	
MET	FORETINIB	inhibitor	TALC MyCancerGenome TD	23213094 26779812	
MET	MK-2461	inhibitor	TALC MyCancerGenome Gu		
MET	ALTIRATINIB	inhibitor	CKB GuideToPharmacology	26285778 26965451 24362531	
MET	PF-04217903	inhibitor	TALC MyCancerGenome CH		
MET	CRIZOTINIB	inhibitor	TALC ClarityFoundationBid	26729443 12460923 26215952 16397241 27595477 19096300 27343442 21716144 27694386 9826708 22594847 26779812 25971938 25922911 22162573 15735036 1104268 25971939 21623265 28514312 17483355 27325282 27149990 26483207 25232318 28765324 21266371 10592235 27393507 25157968 27283993 28522754 23729478 26432108 15494073 26547802 10417759 28396313 11750879	
MET	CABOZANTINIB	antagonist inhibitor	TALC MyCancerGenome Td	27462141 27694386 26432786 21606412 25971939 28192597 27279544 21926191 28396313	
MET	EMIBETUZUMAB	antibody	CKB GuideToPharmacology	27803065 25231402	
MET	ONARTUZUMAB	antibody antagonist inhibitor	TALC MyCancerGenome Td	24101053 27918764 22389872 23882082	
MET	ALECTINIB	inhibitor	GuideToPharmacologyInteractions	-	
MET	AMOXICILLIN	inhibitor	GuideToPharmacologyInteractions	-	
MET	AMG-337	inhibitor	CKB GuideToPharmacology	27196749 25326232 27196782 26432108	
MET	CAPMATINIB	inhibitor	TALC MyCancerGenome On	28783719 27694386 25971938 25971939 28765324 21918175 15494073 28396313	
MET	CLOFIBRATE	inhibitor	GuideToPharmacologyInteractions	-	
MET	GOLVATINIB	inhibitor	CKB GuideToPharmacology		19832844
MET	PHA-665752	inhibitor	CKB GuideToPharmacology	24165158 21266357 23542356	
MET	SGX-523	inhibitor	Td ClinicalTrial CKB GuideToPharmacology	19934279 26483207 10592235	
MET	PYRAZINAMIDE	inhibitor	CKB GuideToPharmacology	19783361 15064724 19723643	
MET	TANESPIVMYCIN	inhibitor	GuideToPharmacologyInteractions	-	
MET	Tepotinib	inhibitor	MyCancerGenome CKB GuideToPharmacology	26358474 23553846 25256830	
MET	TIVANTINIB	inhibitor	TALC MyCancerGenome Td		
MET	MGCD-265	inhibitor	TALC MyCancerGenome Td	27694386 28765324 15494073	
MET	AMG-208	inhibitor	TALC MyCancerGenome CH		
MET	LY-2875358	antibody	TALC MyCancerGenome		
MET	INJ-38877605	inhibitor	TALC CKB ChemblInteractions		23729478
MET	BMS-794833	inhibitor	ChemblInteractions	-	
MET	ABT-700	inhibitor	CKB ChemblInteractions	-	
MET	EMD-1204831	inhibitor	CKB ChemblInteractions	-	25326232
MET	MERESTINIB	inhibitor	CKB ChemblInteractions	26757360 23275061 27694386	
MET	MK-8033	inhibitor	ChemblInteractions TTD	-	
MET	SAR-125844	inhibitor	CKB ChemblInteractions	-	25504634
MET	BPI-9016	inhibitor	ChemblInteractions	-	
MET	AMUVATINIB	inhibitor	TALC MyCancerGenome Td		24326130
MET	RILONACEPT	stimulator	TTD	-	
MET	BMS-817378	inhibitor	ChemblInteractions	-	
MET	CABOZANTINIB S-MALATE	inhibitor	ChemblInteractions	-	
MET	Savolitinib	inhibitor	CKB ChemblInteractions CI	28644771 27694386 25779944 28396313	
MET	TAS-115	inhibitor	CKB ChemblInteractions	-	24140932
MET	CRENOLANIB	inhibitor	MyCancerGenomeClinicalTrials	-	
MET	OLAPARIB	-	CKB		26779812
MET	SELMETINIB	-	CKB		24939055
MET	CHEMBL462712	-	DrugBank		10592235
MET	SORAFENIB	-	CKB		25363205
MET	IMATINIB	-	CKB		28514312
MET	RILOTUMUMAB	-	CKB		

MET	TRAMETINIB	-	CKB		28783719
MET	AFATINIB	-	CKB		27694386
MET	VEMURAFENIB	-	CGI CIViC	27325282 26359985	
MET	CHEMBL458997	-	CKB		26090892
MET	CAPECITABINE	-	CKB		26432108
MET	CHEMBL1081312	-	CKB		26483207
MET	CHEMBL527066	-	DrugBank		10592235
MET	LAPATINIB	-	CKB CGI	27595477 26432108	
MET	CARBOPLATIN	-	CKB		28514312
MET	DASATINIB	-	CKB		26483207
MET	FICLATUZUMAB	-	CKB		24901237
MET	ALVESPIMYCIN	-	CKB		26483207
MET	RUCAPARIB	-	CKB		26779812
MET	PILARALISIB (CHEMBL3218575)	-	CKB		25637314
MET	OXAUIPLATIN	-	CKB		26432108
MET	K-252A	-	CKB DrugBank	12118367 10592235 17139284 17016423	
MET	CHEMBL509101	-	DrugBank		10592235
MET	GANETESPIB	-	CKB		26483207
MET	DACTOLISIB	-	CKB		24939055
MET	PONATINIB	-	CKB		25122427
MET	ROCILETINIB	-	CKB CGI	27252416 27283993	
MET	CHEMBL561660	-	DrugBank		10592235
MET	TRASTUZUMAB	-	CKB CGI	22850551 26432108	
MET	CHEMBL503090	-	DrugBank		10592235
MET	ERLOTINIB	-	PharmGKB CKB	27694386 27803065 24101053	
MET	PACLITAXEL	-	CKB	28514312 26432108	
MET	GEFITINIB	-	CKB CIViC	17463250 24165158 23542356 27612490	
MET	LEUCOVORIN	-	CKB		26432108
MET	CETUXIMAB	-	CKB CIViC		23729478
MET	VELIPARIB	-	CKB		26779812
MET	FLUOROURACIL	-	CKB		26432108
MET	OSIMERTINIB	-	CKB CGI	27694386 27393507 27252416	
MET	BEVACIZUMAB	-	CKB	26965451 26432108 25363205	
MET	PANITUMUMAB	-	CKB CGI		23729478

Table S10: Results of Drug-Gene interactions analysis by DGIdb. Target genes were altered by SNVs in ESCC.

Genes	Identified in CNA analysis (No. of interactions)	Identified in SV analysis (No. of interactions)	Identified in SNV analysis (No. of interactions)
HTR1A	152	0	0
PIK3CA	149	0	149
FGFR1	59	0	0
ADRB3	47	0	0
HPIK3R1	35	0	0
MTNR1A	24	0	0
CDKN2A	20	20	0
SSTR1	16	0	0
CCND1	16	0	0
CDK7	14	0	0
GLRA3	12	0	0
ANO1	12	12	0
SST	10	0	0
HEXB	10	0	0
TUBA3D	0	0	22
TP53	0	108	108
TGFBR1	0	10	0
TACR3	0	0	20
TACR1	0	35	0
SLC5A1	0	11	0
SLC2A1	0	0	13
SLC12A3	0	0	15
SCN9A	0	69	69
SCN1A	0	63	0
RB1	0	22	22
RARB	0	0	13
PTK2	0	0	11
PTGER3	0	18	0
PRKD1	0	10	0
PRKCH	0	11	0
PRKCA	0	20	0
PRKAA1	0	0	11
PIK3CD	0	0	58
PIK3C2G	0	15	0
PIK3C2A	0	0	15
NTRK3	0	13	0
NTRK2	0	17	0
NT5E	0	0	17
NR1H2	0	0	15
NOTCH1	0	15	15
NF1	0	0	22
MTOR	0	0	44
MET	0	0	81
MC4R	0	0	13
KCNQ5	0	0	10
KCNN2	0	0	11

Genes	Identified in CNA analysis (No. of interactions)	Identified in SV analysis (No. of interactions)	Identified in SNV analysis (No. of interactions)
KCNH2	0	0	53
JAK2	0	45	45
ITGAV	0	10	0
HTR5A	0	0	21
HTR2C	0	130	0
HTR1E	0	0	43
HRAS	0	0	46
GRM8	0	12	12
GRIN3A	0	0	38
GRIN2A	0	53	0
GRIK2	0	27	0
GRIA4	0	0	31
GNAQ	0	12	0
GLRB	0	19	0
GABRG2	0	0	38
GABRG1	0	0	62
GABRB1	0	65	0
FGFR2	0	0	48
FCGR3A	0	0	47
FAS	0	0	21
ERBB4	0	24	0
ERBB3	0	0	25
EML4	0	13	0
DTYMK	0	0	10
DRD4	0	0	81
CYP2D6	0	0	82
CPT2	0	0	30
COL4A5	0	11	0
CHRM3	0	129	0
CDK6	0	17	0
CALCRL	0	0	11
CACNA2D2	0	14	0
CACNA1G	0	0	22
CACNA1C	0	35	0
CACNA1B	0	0	21
BRCA2	0	21	0
BRAF	0	0	100
BCHE	0	30	0
AVPR1A	0	0	36
ATR	0	0	10
ATM	0	0	25
APOB	0	0	17
ADK	0	12	0
ADAM17	0	13	0

Genes	Identified in CNA analysis (No. of interactions)	Identified in SV analysis (No. of interactions)	Identified in SNV analysis (No. of interactions)
ABL1	0	0	46
PLAU	0	0	55
PDE4D	0	32	0
NFE2L2	0	0	29
ITGAL	0	25	0
CACNA2D1	0	0	21

Table S11: List of druggable genes with ≥ 10 interactions with drugs. The table presents the genes and the number of drug-interactions identified here in ESCC.

9. ACKNOWLEDGEMENTS:

I would like to thank all the people who have given me the possibility to complete this thesis and have supported me throughout this journey.

Firstly, I would like to express my sincere gratitude to my supervisor Prof. Kenta Nakai for the continuous support, valuable advices and suggestions during this period of my PhD study and related research, for his patience, motivation, and immense knowledge. His guidance helped me in all the time of research and writing of this thesis.

My sincere thanks also goes to Dr. Hidewaki Nakagawa and Dr. Masashi Fujita, who provided me an opportunity to collaborate and join their team. I am very much grateful for their constant advices and comments during my Doctoral study which nurture me as a researcher. Without their precious support it would not be possible to conduct this research. I would also like to express my gratitude to the rest of my thesis committee members: Prof. Kaoru Uchimaru, Prof. Koichi Matsuda, and Prof. Tatsuhiro Shibata, for their insightful comments and encouragement and also for the questions which incited me to widen my research from various perspectives.

I would like to convey my special thanks to Dr. Sung-Joon Park and Dr. Ashwini Patil for their stimulating discussions and advices during these years in Nakai-lab. Also I am thankful to all the current members and outgoing members of this laboratory including Dr. Nagai, Dr. Raul, Dr. Lee, Dr. Moon, Dr. Yokomori, Ishikawa, Rin, Yu, Shin, Zeng, Jia, Darina and Dr. Wei for the support and discussions. A special thanks goes to Yuki Saito for her help throughout these years.

I gratefully acknowledge the funding sources that made my Ph.D. work possible. I would like to thank the University of Tokyo, Ministry of Education, Culture, Sports, Science and Technology (MEXT) and Japan Student Service Organization (JASSO). I thank members of super-computing team, the Human Genome Center, The University of Tokyo for providing the super-computing resource 'SHIROKANE'.

Lastly, I would like to thank my family; my parents, my brothers, my parent-in-laws and my sister-in-laws for all their love and encouragement. Most of all, I would like to thank my loving, supportive, encouraging, and patient husband Biju Saikia for his faithful support during all these years of Ph.D. A special thanks to my one year old loving daughter Ishanvi for her love and sacrifices towards completion of this PhD journey. Thank you.