

# Package ‘UCSCXenaShiny’

October 12, 2022

**Title** Interactive Analysis of UCSC Xena Data

**Version** 1.1.8

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**Description** Provides functions and a Shiny application for downloading, analyzing and visualizing datasets from UCSC Xena (<<http://xena.ucsc.edu/>>), which is a collection of UCSC-hosted public databases such as TCGA, ICGC, TARGET, GTEx, CCLE, and others.

**License** GPL (>= 3)

**URL** <https://github.com/openbiox/UCSCXenaShiny>

**BugReports** <https://github.com/openbiox/UCSCXenaShiny/issues>

**Depends** R (>= 3.5)

**Imports** dplyr (>= 0.8.3), ezcox, forcats, ggplot2 (>= 3.2.0), ggpubr (>= 0.2), magrittr (>= 1.5), ppcor, psych, purrr, shiny (>= 1.3.2), stats, stringr, tibble (>= 2.1.3), tidyr, UCSCXenaTools, utils

**Suggests** covr (>= 3.2.1), cowplot, DT (>= 0.5), furr, future, ggrepel, ggstatsplot, knitr, pacman, plotly, plyr, RColorBrewer (>= 1.1.2), rmarkdown, scales, survival, survminer, testthat (>= 2.0.1)

**VignetteBuilder** knitr

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.1.2

**NeedsCompilation** no

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**Repository** CRAN

**Date/Publication** 2022-06-07 08:10:16 UTC

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---

`analyze_gene_drug_response_asso`  
*Analyze Association between Gene (Signature) and Drug Response  
with CCLE Data*

---

## Description

Analyze partial correlation of gene-drug association after controlling for tissue average expression.

## Usage

```
analyze_gene_drug_response_asso(gene_list, combine = FALSE)
```

## Arguments

`gene_list`      a gene symbol list.  
`combine`        if TRUE, combine the expression of gene list as a gene signature.

## Value

a `data.frame`

- If `combine` is TRUE, genes are combined as signature.
- `mean.diff` and `median.diff` indicate mean and median of normalized expression difference between High IC50 cells and Low IC50 cells. The cutoff between High and Low are median IC50.

## Examples

```
## Not run:
analyze_gene_drug_response_asso("TP53")
analyze_gene_drug_response_asso(c("TP53", "KRAS"))
analyze_gene_drug_response_asso(c("TP53", "KRAS"), combine = TRUE)

# Visualization
vis_gene_drug_response_asso("TP53")

## End(Not run)
```

---

```
analyze_gene_drug_response_diff
```

*Analyze Difference of Drug Response (IC50 Value (uM)) between Gene (Signature) High and Low Expression with CCLE Data*

---

## Description

Analyze Difference of Drug Response (IC50 Value (uM)) between Gene (Signature) High and Low Expression with CCLE Data

## Usage

```
analyze_gene_drug_response_diff(
  gene_list,
  drug = "ALL",
  tissue = "ALL",
  combine = FALSE,
  cutpoint = c(50, 50)
)
```

## Arguments

gene_list	a gene symbol list.
drug	a drug name. Check examples.
tissue	a tissue name. Check examples.
combine	if TRUE, combine the expression of gene list as a gene signature.
cutpoint	cut point (in percent) for High and Low group, default is c(50, 50).

## Value

a data.frame.

## Examples

```
tissue_list <- c(
  "prostate", "central_nervous_system", "urinary_tract", "haematopoietic_and_lymphoid_tissue",
  "kidney", "thyroid", "soft_tissue", "skin", "salivary_gland",
  "ovary", "lung", "bone", "endometrium", "pancreas", "breast",
  "large_intestine", "upper_aerodigestive_tract", "autonomic_ganglia",
  "stomach", "liver", "biliary_tract", "pleura", "oesophagus"
)

drug_list <- c(
  "AEW541", "Nilotinib", "17-AAG", "PHA-665752", "Lapatinib",
  "Nutlin-3", "AZD0530", "PF2341066", "L-685458", "ZD-6474", "Panobinostat",
  "Sorafenib", "Irinotecan", "Topotecan", "LBW242", "PD-0325901",
  "PD-0332991", "Paclitaxel", "AZD6244", "PLX4720", "RAF265", "TAE684",
)
```

```

    "TKI258", "Erlotinib"
  )

  target_list <- c(
    "IGF1R", "ABL", "HSP90", "c-MET", "EGFR", "MDM2", "GS", "HDAC",
    "RTK", "TOP1", "XIAP", "MEK", "CDK4", "TUBB1", "RAF", "ALK", "FGFR"
  )
  ## Not run:
  analyze_gene_drug_response_diff("TP53")
  analyze_gene_drug_response_diff(c("TP53", "KRAS"), drug = "AEW541")
  analyze_gene_drug_response_diff(c("TP53", "KRAS"),
    tissue = "kidney",
    combine = TRUE
  )

  # Visualization
  vis_gene_drug_response_diff("TP53")

  ## End(Not run)

```

---

app\_run

*Run UCSC Xena Shiny App*


---

## Description

Run UCSC Xena Shiny App

## Usage

```
app_run(runMode = "client", port = getOption("shiny.port"))
```

## Arguments

runMode	default is 'client' for personal user, set it to 'server' for running on server.
port	The TCP port that the application should listen on. If the port is not specified, and the shiny.port option is set (with options(shiny.port = XX)), then that port will be used. Otherwise, use a random port between 3000:8000, excluding ports that are blocked by Google Chrome for being considered unsafe: 3659, 4045, 5060, 5061, 6000, 6566, 6665:6669 and 6697. Up to twenty random ports will be tried.

## Examples

```

## Not run:
app_run()

## End(Not run)

```

---

available_hosts	<i>Show Available Hosts</i>
-----------------	-----------------------------

---

**Description**

Show Available Hosts

**Usage**

```
available_hosts()
```

**Value**

hosts

**Examples**

```
available_hosts()
```

---

ccl_absolute	<i>ABSOLUTE Result of CCLE Database</i>
--------------	---

---

**Description**

ABSOLUTE Result of CCLE Database

**Format**

A data.frame

**Source**

see "data\_source" attribute.

**Examples**

```
data("ccl_absolute")
```

---

`ccl_info`*Phenotype Info of CCLE Database*

---

**Description**

Phenotype Info of CCLE Database

**Format**

A `data.frame`

**Source**

UCSC Xena.

**Examples**

```
data("ccl_info")
```

---

`ezcor`*Run Correlation between Two Variables and Support Group by a Variable*

---

**Description**

Run Correlation between Two Variables and Support Group by a Variable

**Usage**

```
ezcor(  
  data = NULL,  
  split = FALSE,  
  split_var = NULL,  
  var1 = NULL,  
  var2 = NULL,  
  cor_method = "pearson",  
  adjust_method = "none",  
  use = "complete",  
  sig_label = TRUE,  
  verbose = TRUE  
)
```

**Arguments**

data	a data.frame containing variables
split	whether perform correlation grouped by a variable, default is 'FALSE'
split_var	a character, the group variable
var1	a character, the first variable in correlation
var2	a character, the second variable in correlation
cor_method	method="pearson" is the default value. The alternatives to be passed to cor are "spearman" and "kendall"
adjust_method	What adjustment for multiple tests should be used? ("holm", "hochberg", "holm", "bonferroni", "BH", "BY", "fdr", "none")
use	use="pairwise" will do pairwise deletion of cases. use="complete" will select just complete cases
sig_label	whether add symbol of significance. P < 0.001,***; P < 0.01,**; P < 0.05,*; P >=0.05,""
verbose	if TRUE, print extra info.

**Value**

a data.frame

**Author(s)**

Yi Xiong

---

ezcor_batch	<i>Run correlation between two variables in a batch mode and support group by a variable</i>
-------------	--

---

**Description**

Run correlation between two variables in a batch mode and support group by a variable

**Usage**

```
ezcor_batch(
  data,
  var1,
  var2,
  split = FALSE,
  split_var = NULL,
  cor_method = "pearson",
  adjust_method = "none",
  use = "complete",
  sig_label = TRUE,
  parallel = FALSE,
  verbose = FALSE
)
```



**Arguments**

data	a data.frame containing variables
var1	a character, the first variable in correlation
var2	a character, the second variable in correlation
split	whether perform correlation grouped by a variable, default is 'FALSE'
split_var	a character, the group variable
cor_method	method="pearson" is the default value. The alternatives to be passed to cor are "spearman" and "kendall"
adjust_method	What adjustment for multiple tests should be used? ("holm", "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr", "none")
use	use="pairwise" will do pairwise deletion of cases. use="complete" will select just complete cases
sig_label	whether add symbol of significance. P < 0.001,***; P < 0.01,**; P < 0.05,*; P >=0.05,""
parallel	if TRUE, do parallel computation by <b>furrr</b> package.
verbose	if TRUE, print extra info.

**Value**

a data.frame

**Author(s)**

Yi Xiong, Shixiang Wang

---

ezcor\_partial\_cor      *Run partial correlation*

---

**Description**

Run partial correlation

**Usage**

```
ezcor_partial_cor(
  data = NULL,
  split = FALSE,
  split_var = NULL,
  var1 = NULL,
  var2 = NULL,
  var3 = NULL,
  cor_method = "pearson",
  sig_label = TRUE,
  ...
)
```

**Arguments**

data	a data.frame containing variables
split	whether perform correlation grouped by a variable, default is 'FALSE'
split_var	a character, the group variable
var1	a character, the first variable in correlation
var2	a character, the second variable in correlation
var3	a character or character vector, the third variable in correlation
cor_method	method="pearson" is the default value. The alternatives to be passed to cor are "spearman" and "kendall"
sig_label	whether add symbol of significance. $P < 0.001$ , ""; <b><math>P &lt; 0.01</math></b> , ""; $P < 0.05$ , ""; $P \geq 0.05$ , ""
...	other arguments passed to methods

**Value**

a data.frame

**Author(s)**

Yi Xiong

**See Also**

[ppcor::pcor.test\(\)](#) which this function wraps.

---

get\_ccle\_cn\_value      *Fetch Identifier Value from Pan-cancer Dataset*

---

**Description**

Identifier includes gene/probe etc.

**Usage**

```
get_ccle_cn_value(identifier)
get_ccle_gene_value(identifier)
get_ccle_protein_value(identifier)
get_ccle_mutation_status(identifier)

get_pancan_value(
  identifier,
  subtype = NULL,
```

```

    dataset = NULL,
    host = available_hosts(),
    samples = NULL
)

get_pancan_gene_value(identifier)

get_pancan_transcript_value(identifier)

get_pancan_protein_value(identifier)

get_pancan_mutation_status(identifier)

get_pancan_cn_value(identifier, use_thresholded_data = TRUE)

get_pancan_methylation_value(identifier, type = c("450K", "27K"))

get_pancan_miRNA_value(identifier)

get_pcawg_gene_value(identifier)

get_pcawg_fusion_value(identifier)

get_pcawg_promoter_value(identifier, type = c("raw", "relative", "outlier"))

get_pcawg_miRNA_value(identifier, norm_method = c("TMM", "UQ"))

get_pcawg_APOBEC_mutagenesis_value(
  identifier = c("tCa_MutLoad_MinEstimate", "APOBECtCa_enrich", "A3A_or_A3B",
    "APOBEC_tCa_enrich_quartile", "APOBECrtCa_enrich", "APOBECcytCa_enrich",
    "APOBECcytCa_enrich-APOBECrtCa_enrich", "BH_Fisher_p-value_tCa", "ntca+tgan",
    "rtCa_to_G+rtCa_to_T", "rtca+tgay", "tCa_to_G+tCa_to_T",
    "ytCa_rtCa_BH_Fisher_p-value", "ytCa_rtCa_Fisher_p-value", "ytCa_to_G+ytCa_to_T",
    "ytca+tgay")
)

```

### Arguments

identifier	a length-1 character representing a gene symbol, ensembl gene id, or probe id. Gene symbol is highly recommended.
subtype	a length-1 character representing a regular expression for matching DataSubtype column of <a href="#">UCSCXenaTools::XenaData</a> .
dataset	a length-1 character representing a regular expression for matching XenaDatasets of <a href="#">UCSCXenaTools::XenaData</a> .
host	a character vector representing host name(s), e.g. "toilHub".
samples	a character vector representing samples want to be returned.
use_thresholded_data	if TRUE (default), use GISTIC2-thresholded value.

type                   methylation type, one of "450K" and "27K". for function `get_pcawg_promoter_value`, it can be one of "raw", "relative", "outlier".

norm\_method           the normalization method.

### Value

a named vector or list.

### Functions

- `get_ccle_cn_value`: Fetch copy number value from CCLE dataset
- `get_ccle_gene_value`: Fetch gene expression value from CCLE dataset
- `get_ccle_protein_value`: Fetch gene protein expression value from CCLE dataset
- `get_ccle_mutation_status`: Fetch gene mutation info from CCLE dataset
- `get_pancan_value`: Fetch identifier value from pan-cancer dataset
- `get_pancan_gene_value`: Fetch gene expression value from pan-cancer dataset
- `get_pancan_transcript_value`: Fetch gene transcript expression value from pan-cancer dataset
- `get_pancan_protein_value`: Fetch protein expression value from pan-cancer dataset
- `get_pancan_mutation_status`: Fetch mutation status value from pan-cancer dataset
- `get_pancan_cn_value`: Fetch gene copy number value from pan-cancer dataset processed by GISTIC 2.0
- `get_pancan_methylation_value`: Fetch gene expression value from CCLE dataset
- `get_pancan_miRNA_value`: Fetch miRNA expression value from pan-cancer dataset
- `get_pcawg_gene_value`: Fetch specimen-level gene expression value from PCAWG cohort
- `get_pcawg_fusion_value`: Fetch specimen-level gene fusion value from PCAWG cohort
- `get_pcawg_promoter_value`: Fetch specimen-level gene promoter activity value from PCAWG cohort
- `get_pcawg_miRNA_value`: Fetch specimen-level miRNA value from PCAWG cohort
- `get_pcawg_APOBEC_mutagenesis_value`: Fetch specimen-level gene fusion value from PCAWG cohort

### Examples

```
## Not run:
# Fetch TP53 expression value from pan-cancer dataset
t1 <- get_pancan_value("TP53",
  dataset = "TcgaTargetGtex_rsem_isoform_tpm",
  host = "toilHub"
)
t2 <- get_pancan_gene_value("TP53")
t3 <- get_pancan_protein_value("AKT")
t4 <- get_pancan_mutation_status("TP53")
t5 <- get_pancan_cn_value("TP53")

## End(Not run)
```

---

keep_cat_cols	<i>Keep Only Columns Used for Sample Selection</i>
---------------	--

---

**Description**

Keep Only Columns Used for Sample Selection

**Usage**

```
keep_cat_cols(x, keep_sam_cols = TRUE, return_idx = TRUE)
```

**Arguments**

x	a data.frame with many columns.
keep_sam_cols	if TRUE (default), keep columns with pattern 'sample', 'patient', etc.
return_idx	if TRUE (default), return index of 5 (at most) columns, it is useful in Shiny.

**Value**

a data.frame or a list.

---

load_data	<i>Load Dataset Provided by This Package</i>
-----------	--

---

**Description**

Load data from builtin or Zenodo. Option xena.zenodoDir can be used to set default path for storing extra data from Zenodo, e.g., options(xena.zenodoDir = "/home/xxx/dataset").

**Usage**

```
load_data(name)
```

**Arguments**

name	a dataset name. Could be one of <b>Builtin datasets:</b> <ul style="list-style-type: none"> <li>• ccle_absolute: CCLE ABSOLUTE result.</li> <li>• ccle_info: CCLE information.</li> <li>• pcawg_info: PCAWG information.</li> <li>• pcawg_purity: PCAWG tumor purity, ploidy and WGD data.</li> <li>• tcga_clinical: TCGA clinical data.</li> <li>• tcga_genome_instability: TCGA genome instability data.</li> <li>• tcga_gtex: TCGA and GTEX sample info.</li> </ul>
------	---

- tcga\_purity: TCGA tumor purity data.
- tcga\_subtypes: TCGA subtypes data.
- tcga\_surv: TCGA survival data.
- TCGA.organ: TCGA organ data.
- toil\_info: Toil hub information.

**Remote datasets stored in [Zenodo](#):**

- pcawg\_promoter\_id: PCAWG promoter identifiers.
- transcript\_identifier: Common transcript identifiers.
- ccle\_expr\_and\_drug\_response: CCLE expression and drug response data.
- ccle\_drug\_response\_extend: CCLE drug response extended data.
- pancan\_MSI: Pan-cancer MSI data.
- tcga\_chr\_alteration: TCGA chromosome alteration data.
- tcga\_MSI: TCGA MSI data.
- tcga\_pan\_immune\_signature: TCGA pan-cancer immune signature.
- tcga\_stemness: TCGA tumor stemness data.
- tcga\_TIL: TCGA TIL data.
- tcga\_tmb: TCGA TMB data.
- tcga\_armcalls: TCGA arm alteration calls and Aneuploidy data.
- tcga\_dna\_repair: TCGA DNA repair data.
- pancancer\_conserved\_immune\_subtype: Pan-cancer conserved immune subtypes.

**Value**

a dataset, typically a `data.frame`.

**Examples**

```
data1 <- load_data("tcga_surv")
data1

data2 <- load_data("tcga_armcalls")
data2
```

---

pcawg\_info

*Phenotype Info of PCAWG Database*

---

**Description**

Phenotype Info of PCAWG Database

**Format**

A `data.frame`

**Source**

UCSC Xena.

**Examples**

```
data("pcawg_info")
```

---

pcawg_purity	<i>Purity Data of PCAWG</i>
--------------	-----------------------------

---

**Description**

Purity Data of PCAWG

**Format**

A data.frame

**Source**

UCSC Xena.

**Examples**

```
data("pcawg_purity")
```

---

query_molecule_value	<i>Get Molecule or Signature Data Values from Dense (Genomic) Matrix Dataset of UCSC Xena Data Hubs</i>
----------------------	---

---

**Description**

Get Molecule or Signature Data Values from Dense (Genomic) Matrix Dataset of UCSC Xena Data Hubs

**Usage**

```
query_molecule_value(dataset, molecule, host = NULL)
```

**Arguments**

dataset	a UCSC Xena dataset in dense matrix format (rows are features (e.g., gene, cell line) and columns are samples).
molecule	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN"). <b>NOTE</b> , when a signature is specified, a space must exist in the input.
host	a UCSC Xena host, default is NULL, auto-detect from the dataset.

**Value**

a named vector.

**Examples**

```
# What does dense matrix mean?
table(UCSCXenaTools::XenaData$Type)
# It is a the UCSC Xena dataset with "Type" equals to "genomicMatrix"
## Not run:
dataset <- "ccle/CCLC_copynumber_byGene_2013-12-03"
x <- query_molecule_value(dataset, "TP53")
head(x)

signature <- "TP53 + 2*KRAS - 1.3*PTEN" # a space must exist in the string
y <- query_molecule_value(dataset, signature)
head(y)

## End(Not run)
```

---

query\_pancan\_value      *Query Single Identifier or Signature Value from Pan-cancer Database*

---

**Description**

Query Single Identifier or Signature Value from Pan-cancer Database

**Usage**

```
query_pancan_value(
  molecule,
  data_type = c("mRNA", "transcript", "protein", "mutation", "cnv", "cnv_gistic2",
    "methylation", "miRNA", "fusion", "promoter", "APOBEC"),
  database = c("toil", "ccle", "pcawg"),
  reset_id = NULL,
  ...
)
```

**Arguments**

molecule	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
data_type	data type. Can be one of "mRNA", "transcript", "protein", "mutation", "cnv" (-2, -1, 0, 1, 2), "cnv_gistic2", "methylation", "miRNA".
database	database, either 'toil' for TCGA TARGET GTEx, or 'ccle' for CCLE.
reset_id	if not NULL, set the specified variable at parent frame to "Signature".
...	other extra parameters passing to the underlying functions.



**Value**

a list.

**Examples**

```
## Not run:
query_pancan_value("KRAS")
query_pancan_value("KRAS", database = "ccle")
query_pancan_value("KRAS", database = "pcawg")
query_pancan_value("hsa-let-7c-3p",
  database = "pcawg",
  data_type = "miRNA"
)
query_pancan_value("hsa-let-7c-3p",
  database = "pcawg",
  data_type = "miRNA", norm_method = "UQ"
)
query_pancan_value("ENSG00000000419",
  database = "pcawg",
  data_type = "fusion"
) # gene symbol also work
query_pancan_value("tCa_MutLoad_MinEstimate",
  database = "pcawg", data_type = "APOBEC"
)
query_pancan_value("prmtr.10000",
  database = "pcawg", data_type = "promoter"
)

## End(Not run)
```

---

query\_toil\_value\_df    *Obtain ToilHub Info for Single Molecule*

---

**Description**

Obtain ToilHub Info for Single Molecule

Obtain ToilHub Info for Single Gene

**Usage**

```
query_toil_value_df(identifier = "TP53")
```

```
query_toil_value_df(identifier = "TP53")
```

**Arguments**

**identifier**    a length-1 character representing a gene symbol, ensembl gene id, or probe id. Gene symbol is highly recommended.

**Value**

a tibble  
a tibble

**Examples**

```
## Not run:  
t <- query_toil_value_df()  
t  
  
## End(Not run)  
## Not run:  
t <- query_toil_value_df()  
t  
  
## End(Not run)
```

---

tcga survival analysis

*TCGA Survival Analysis*

---

**Description**

- Firstly, get merged data of one molecular profile value and associated clinical data from TCGA Pan-Cancer dataset.
- Secondly, filter data as your wish.
- Finally, show K-M plot.

**Usage**

```
tcga_surv_get(  
  item,  
  TCGA_cohort = "LUAD",  
  profile = c("mRNA", "miRNA", "methylation", "transcript", "protein", "mutation",  
             "cnv"),  
  TCGA_cli_data = dplyr::full_join(load_data("tcga_clinical"), load_data("tcga_surv"),  
                                   by = "sample")  
)  
  
tcga_surv_plot(  
  data,  
  time = "time",  
  status = "status",  
  cutoff_mode = c("Auto", "Custom"),  
  cutpoint = c(50, 50),  
  cnv_type = c("Duplicated", "Normal", "Deleted"),
```

```

  profile = c("mRNA", "miRNA", "methylation", "transcript", "protein", "mutation",
             "cnv"),
  palette = "aaas",
  ...
)

```

## Arguments

<code>item</code>	a molecular identifier, can be gene symbol (common cases), protein symbol, etc.
<code>TCGA_cohort</code>	a TCGA cohort, e.g. "LUAD" (default), "LUSC", "ACC".
<code>profile</code>	a molecular profile. Option can be one of "mRNA" (default), "miRNA", "methylation", "transcript", "protein", "mutation", "cnv".
<code>TCGA_cli_data</code>	a data.frame containing TCGA clinical data. Default use pre-compiled TCGA clinical data in this package.
<code>data</code>	a subset of result from <code>tcga_surv_get()</code> .
<code>time</code>	the column name for "time".
<code>status</code>	the column name for "status".
<code>cutoff_mode</code>	mode for grouping samples, can be "Auto" (default) or "Custom".
<code>cutpoint</code>	cut point (in percent) for "Custom" mode, default is <code>c(50, 50)</code> .
<code>cnv_type</code>	only used when profile is "cnv", can select from <code>c("Duplicated", "Normal", "Deleted")</code> .
<code>palette</code>	color palette, can be "hue", "grey", "RdBu", "Blues", "npg", "aaas", etc. More see <code>?survminer::ggsurvplot</code> .
<code>...</code>	other parameters passing to <code>survminer::ggsurvplot</code>

## Value

a data.frame or a plot.

## Examples

```

## Not run:
# 1. get data
data <- tcga_surv_get("TP53")
# 2. filter data (optional)

# 3. show K-M plot
tcga_surv_plot(data, time = "DSS.time", status = "DSS")

## End(Not run)

```

---

TCGA.organ

*TCGA: Organ Data*

---

### **Description**

TCGA: Organ Data

### **Format**

A [data.frame](#)

### **Examples**

```
data("TCGA.organ")
```

---

tcga\_clinical

*Toil Hub: TCGA Clinical Data*

---

### **Description**

See `tcga_surv` for TCGA survival data.

### **Format**

A [data.frame](#)

### **Source**

Generate from data-raw

### **Examples**

```
data("tcga_clinical")
```

---

`tcga_genome_instability`*TCGA: Genome Instability Data*

---

**Description**

TCGA: Genome Instability Data

**Format**A [data.frame](#)**Source**<https://gdc.cancer.gov/about-data/publications/PanCanStemness-2018>**Examples**`data("tcga_genome_instability")`

---

`tcga_gtex`*Toil Hub: Merged TCGA GTEx Selected Phenotype*

---

**Description**

Toil Hub: Merged TCGA GTEx Selected Phenotype

**Format**A [data.frame](#)**Examples**`data("tcga_gtex")`

---

tcga\_purity

*TCGA: Purity Data*

---

**Description**

TCGA: Purity Data

**Format**

A [data.frame](#)

**Source**

<https://www.nature.com/articles/ncomms9971#Sec14>

**Examples**

```
data("tcga_purity")
```

---

tcga\_subtypes

*TCGA Subtype Data*

---

**Description**

TCGA Subtype Data

**Format**

A [data.frame](#)

**Source**

UCSC Xena.

**Examples**

```
data("tcga_subtypes")
```

---

`tcga_surv`*Toil Hub: TCGA Survival Data*

---

**Description**

Toil Hub: TCGA Survival Data

**Format**A [data.frame](#)**Source**

Generate from data-raw

**Examples**

```
data("tcga_surv")
```

---

`tcga_tmb`*TCGA: TMB (Tumor Mutation Burden) Data*

---

**Description**

TCGA: TMB (Tumor Mutation Burden) Data

**Format**A [data.frame](#)**Source**<https://gdc.cancer.gov/about-data/publications/panimmune>**Examples**

```
data("tcga_tmb")
```

---

toil\_info

*Toil Hub: TCGA TARGET GTEX Selected Phenotype*

---

**Description**

Toil Hub: TCGA TARGET GTEX Selected Phenotype

**Format**

A [data.frame](#)

**Source**

Generate from data-raw

**Examples**

```
data("toil_info")
```

---

UCSCXenaShiny

*Xena Shiny App*

---

**Description**

A Shiny App for UCSC Xena Data Hubs. See <https://github.com/openbio/UCSCXenaShiny> for details.

---

vis\_ccle\_gene\_cor

*Visualize CCLE Gene Expression Correlation*

---

**Description**

Visualize CCLE Gene Expression Correlation



**Usage**

```
vis_ccle_gene_cor(
  Gene1 = "CSF1R",
  Gene2 = "JAK3",
  data_type1 = "mRNA",
  data_type2 = "mRNA",
  cor_method = "spearman",
  use_log_x = FALSE,
  use_log_y = FALSE,
  use_regline = TRUE,
  SitePrimary = "prostate",
  use_all = FALSE,
  alpha = 0.5,
  color = "#000000"
)
```

**Arguments**

Gene1	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
Gene2	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
data_type1	choose gene profile type for the first gene, including "mRNA", "transcript", "methylation", "miRNA", "prote"
data_type2	choose gene profile type for the second gene, including "mRNA", "transcript", "methylation", "miRNA", "pr"
cor_method	correlation method
use_log_x	if TRUE, log X values.
use_log_y	if TRUE, log Y values.
use_regline	if TRUE, add regression line.
SitePrimary	select cell line origin tissue.
use_all	use all sample, default FALSE.
alpha	dot alpha.
color	dot color.

**Value**

a ggplot object

---

vis_ccle_tpm	<i>Visualize CCLE Gene Expression</i>
--------------	---------------------------------------

---

**Description**

Visualize CCLE Gene Expression

**Usage**

```
vis_ccle_tpm(Gene = "TP53", data_type = "mRNA", use_log = FALSE)
```

**Arguments**

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
data_type	support genomic profile for CCLE, currently "mRNA", "protein", "cnv" are supported
use_log	if TRUE, log values.

**Value**

a ggplot object

---

vis_gene_cor	<i>Visualize Gene-Gene Correlation in TCGA</i>
--------------	--

---

**Description**

Visualize Gene-Gene Correlation in TCGA

**Usage**

```
vis_gene_cor(
  Gene1 = "CSF1R",
  Gene2 = "JAK3",
  data_type1 = "mRNA",
  data_type2 = "mRNA",
  use_regline = TRUE,
  purity_adj = TRUE,
  alpha = 0.5,
  color = "#000000",
  filter_tumor = TRUE
)
```

**Arguments**

Gene1	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
Gene2	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
data_type1	choose gene profile type for the first gene, including "mRNA", "transcript", "methylation", "miRNA", "prote
data_type2	choose gene profile type for the second gene, including "mRNA", "transcript", "methylation", "miRNA", "pr
use_regline	if TRUE, add regression line.
purity_adj	whether performing partial correlation adjusted by purity
alpha	dot alpha.
color	dot color.
filter_tumor	whether use tumor sample only, default TRUE

---

vis\_gene\_cor\_cancer     *Visualize Gene-Gene Correlation in a TCGA Cancer Type*

---

**Description**

Visualize Gene-Gene Correlation in a TCGA Cancer Type

**Usage**

```
vis_gene_cor_cancer(
  Gene1 = "CSF1R",
  Gene2 = "JAK3",
  data_type1 = "mRNA",
  data_type2 = "mRNA",
  purity_adj = TRUE,
  cancer_choose = "GBM",
  use_regline = TRUE,
  cor_method = "spearman",
  use_all = FALSE,
  alpha = 0.5,
  color = "#000000"
)
```

**Arguments**

Gene1	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
Gene2	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
data_type1	choose gene profile type for the first gene, including "mRNA", "transcript", "methylation", "miRNA", "prote

data_type2	choose gene profile type for the second gene, including "mRNA", "transcript", "methylation", "miRNA", "pr
purity_adj	whether performing partial correlation adjusted by purity
cancer_choose	TCGA cohort name, e.g. "ACC".
use_regline	if TRUE, add regression line.
cor_method	correlation method.
use_all	use all sample, default FALSE.
alpha	dot alpha.
color	dot color.

---

vis\_gene\_drug\_response\_asso

*Visualize Gene and Drug-Target Association with CCLE Data*

---

## Description

See [analyze\\_gene\\_drug\\_response\\_asso](#) for examples.

## Usage

```
vis_gene_drug_response_asso(
  Gene = "TP53",
  x_axis_type = c("mean.diff", "median.diff"),
  output_form = c("plotly", "ggplot2")
)
```

## Arguments

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
x_axis_type	set the value type for X axis.
output_form	plotly or ggplot2.

## Value

plotly or ggplot2 object.

---

 vis\_gene\_drug\_response\_diff

*Visualize Gene and Drug Response Difference with CCLE Data*


---

### Description

See [analyze\\_gene\\_drug\\_response\\_diff](#) for examples.

### Usage

```
vis_gene_drug_response_diff(  
  Gene = "TP53",  
  tissue = "lung",  
  Show.P.label = TRUE,  
  Method = "wilcox.test",  
  values = c("#DF2020", "#DDDF21"),  
  alpha = 0.5  
)
```

### Arguments

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
tissue	select cell line origin tissue.
Show.P.label	TRUE or FALSE present p value with number or label *, **, *** and ****
Method	default method is wilcox.test
values	the color to fill tumor or normal
alpha	set alpha for dots.

### Value

a ggplot object.

---

 vis\_gene\_immune\_cor

*Heatmap for Correlation between Gene and Immune Signatures*


---

### Description

Heatmap for Correlation between Gene and Immune Signatures

**Usage**

```
vis_gene_immune_cor(
  Gene = "TP53",
  cor_method = "spearman",
  data_type = "mRNA",
  Immune_sig_type = "Cibersort",
  Plot = "TRUE"
)
```

**Arguments**

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
cor_method	correlation method
data_type	choose gene profile type, including "mRNA", "transcript", "protein", "mutation", "cnv" (-2, -1, 0, 1, 2), "cnv_gistic2", "methylation", "miRNA".
Immune_sig_type	quantification method, default is "Cibersort"
Plot	output the plot directly, default 'TRUE'

**Examples**

```
## Not run:
p <- vis_gene_immune_cor(Gene = "TP53")

## End(Not run)
```

---

vis_gene_msi_cor	<i>Visualize Correlation between Gene and MSI (Microsatellite instability)</i>
------------------	--

---

**Description**

Visualize Correlation between Gene and MSI (Microsatellite instability)

**Usage**

```
vis_gene_msi_cor(
  Gene = "TP53",
  cor_method = "spearman",
  data_type = "mRNA",
  Plot = "TRUE"
)
```

**Arguments**

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
cor_method	correlation method
data_type	choose gene profile type, including "mRNA", "transcript", "protein", "mutation", "cnv" (-2, -1, 0, 1, 2), "cnv_gistic2", "methylation", "miRNA".
Plot	output the plot directly, default 'TRUE'

**Examples**

```
## Not run:
p <- vis_gene_msi_cor(Gene = "TP53")

## End(Not run)
```

---

vis\_gene\_stemness\_cor *Visualize Correlation between Gene and Tumor Stemness*

---

**Description**

Visualize Correlation between Gene and Tumor Stemness

**Usage**

```
vis_gene_stemness_cor(
  Gene = "TP53",
  cor_method = "spearman",
  data_type = "mRNA",
  Plot = "TRUE"
)
```

**Arguments**

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
cor_method	correlation method
data_type	choose gene profile type, including "mRNA", "transcript", "protein", "mutation", "cnv" (-2, -1, 0, 1, 2), "cnv_gistic2", "methylation", "miRNA".
Plot	output the plot directly, default 'TRUE'

**Examples**

```

## Not run:
p <- vis_gene_stemness_cor(Gene = "TP53")
p

## End(Not run)
## To generate a radar plot, uncomment the following code
# pdata <- p$data %>%
#   dplyr::mutate(cor = round(cor, digits = 3), p.value = round(p.value, digits = 3))
#
# df <- pdata %>%
#   select(cor, cancer) %>%
#   pivot_wider(names_from = cancer, values_from = cor)
#
# ggradar::ggradar(
#   df[1, ],
#   font.radar = "sans",
#   values.radar = c("-1", "0", "1"),
#   grid.min = -1, grid.mid = 0, grid.max = 1,
#   # Background and grid lines
#   background.circle.colour = "white",
#   gridline.mid.colour = "grey",
#   # Polygons
#   group.line.width = 1,
#   group.point.size = 3,
#   group.colours = "#00AFBB" +
#   theme(plot.title = element_text(hjust = .5))

```

---

vis_gene_TIL_cor	<i>Heatmap for Correlation between Gene and Tumor Immune Infiltration (TIL)</i>
------------------	---

---

**Description**

Heatmap for Correlation between Gene and Tumor Immune Infiltration (TIL)

**Usage**

```

vis_gene_TIL_cor(
  Gene = "TP53",
  cor_method = "spearman",
  data_type = "mRNA",
  sig = c("B cell_TIMER", "T cell CD4+_TIMER", "T cell CD8+_TIMER", "Neutrophil_TIMER",
    "Macrophage_TIMER", "Myeloid dendritic cell_TIMER"),
  Plot = "TRUE"
)

```



**Arguments**

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
cor_method	correlation method
data_type	choose gene profile type, including "mRNA", "transcript", "protein", "mutation", "cnv" (-2, -1, 0, 1, 2), "cnv_gistic2", "methylation", "miRNA".
sig	Immune Signature, default: result from TIMER
Plot	output the plot directly, default 'TRUE'

**Examples**

```
## Not run:
p <- vis_gene_TIL_cor(Gene = "TP53")

## End(Not run)
```

---

vis_gene_tmb_cor	<i>Visualize Correlation between Gene and TMB (Tumor Mutation Burden)</i>
------------------	---

---

**Description**

Visualize Correlation between Gene and TMB (Tumor Mutation Burden)

**Usage**

```
vis_gene_tmb_cor(
  Gene = "TP53",
  cor_method = "spearman",
  data_type = "mRNA",
  Plot = "TRUE"
)
```

**Arguments**

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
cor_method	correlation method
data_type	choose gene profile type, including "mRNA", "transcript", "protein", "mutation", "cnv" (-2, -1, 0, 1, 2), "cnv_gistic2", "methylation", "miRNA".
Plot	output the plot directly, default 'TRUE'

## Examples

```
## Not run:  
p <- vis_gene_tmb_cor(Gene = "TP53")  
  
## End(Not run)
```

---

vis\_identifier\_cor      *Visualize Identifier-Identifier Correlation*

---

## Description

NOTE: the dataset must be dense matrix in UCSC Xena data hubs.

## Usage

```
vis_identifier_cor(  
  dataset1,  
  id1,  
  dataset2,  
  id2,  
  samples = NULL,  
  use_ggstats = FALSE,  
  use_simple_axis_label = TRUE,  
  line_color = "blue",  
  alpha = 0.5,  
  ...  
)
```

## Arguments

dataset1	the dataset to obtain id1.
id1	the first molecule identifier.
dataset2	the dataset to obtain id2.
id2	the second molecule identifier.
samples	default is NULL, can be common sample names for two datasets.
use_ggstats	if TRUE, use <code>ggstatsplot</code> package for plotting.
use_simple_axis_label	if TRUE (default), use simple axis labels. Otherwise, data subtype will be labeled.
line_color	set the color for regression line.
alpha	set the alpha for dots.
...	other parameters passing to <code>ggscatter</code> .

## Value

a (gg)plot object.

**Examples**

```
## Not run:
dataset <- "TcgaTargetGtex_rsem_isoform_tpm"
id1 <- "TP53"
id2 <- "KRAS"
vis_identifier_cor(dataset, id1, dataset, id2)

samples <- c(
  "TCGA-D5-5538-01", "TCGA-VM-A8C8-01",
  "TCGA-ZN-A9VQ-01", "TCGA-EE-A17X-06",
  "TCGA-05-4420-01"
)
vis_identifier_cor(dataset, id1, dataset, id2, samples)

dataset1 <- "TCGA-BLCA.htseq_counts.tsv"
dataset2 <- "TCGA-BLCA.gistic.tsv"
id1 <- "TP53"
id2 <- "KRAS"
vis_identifier_cor(dataset1, id1, dataset2, id2)

## End(Not run)
```

---

```
vis_identifier_grp_comparison
```

*Visualize Comparison of an Molecule Identifier between Groups*

---

**Description**

NOTE: the dataset must be dense matrix in UCSC Xena data hubs.

**Usage**

```
vis_identifier_grp_comparison(
  dataset = NULL,
  id = NULL,
  grp_df,
  samples = NULL,
  fun_type = c("betweenstats", "withinstats"),
  type = c("parametric", "nonparametric", "robust", "bayes"),
  pairwise.comparisons = TRUE,
  p.adjust.method = c("holm", "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr",
    "none"),
  ggtheme = cowplot::theme_cowplot(),
  ...
)
```

**Arguments**

dataset	the dataset to obtain identifiers.
id	the molecule identifier.
grp_df	When dataset and id are all not NULL, it should be a <code>data.frame</code> with 2 or 3 columns. <ul style="list-style-type: none"> <li>• The first column refers to sample ID.</li> <li>• The second column refers to groups indicated in axis X.</li> <li>• The third column is optional, which indicates facet variable. When any of dataset and id is NULL, it should be a <code>data.frame</code> with 3 or 4 columns.</li> <li>• The first column refers to sample ID.</li> <li>• The second column refers to values indicated in axis Y.</li> <li>• The third column refers to groups indicated in axis X.</li> <li>• The fourth column is optional, which indicates facet variable.</li> </ul>
samples	default is NULL, can be common sample names for two datasets.
fun_type	select the function to compare groups.
type	A character specifying the type of statistical approach: <ul style="list-style-type: none"> <li>• "parametric"</li> <li>• "nonparametric"</li> <li>• "robust"</li> <li>• "bayes"</li> </ul> <p>You can specify just the initial letter.</p>
pairwise.comparisons	Logical that decides whether pairwise comparisons are to be displayed (default: TRUE). Please note that only <b>significant</b> comparisons will be shown by default. To change this behavior, select appropriate option with <code>pairwise.display</code> argument. The pairwise comparison dataframes are prepared using the <code>pairwise_comparisons</code> function. For more details about pairwise comparisons, see the documentation for that function.
p.adjust.method	Adjustment method for <i>p</i> -values for multiple comparisons. Possible methods are: "holm" (default), "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr", "none".
ggtheme	A {ggplot2} theme. Default value is <code>ggstatsplot::theme_ggstatsplot()</code> . Any of the {ggplot2} themes (e.g., <code>theme_bw()</code> ), or themes from extension packages are allowed (e.g., <code>ggthemes::theme_fivethirtyeight()</code> , <code>hrbrthemes::theme_ipsum_ps()</code> etc.).
...	other parameters passing to <code>ggstatsplot::ggbetweenstats</code> or <code>ggstatsplot::ggwithinstats</code> .

**Value**

a (gg)plot object.

**Examples**

```
## Not run:
library(UCSCXenaTools)
expr_dataset <- "TCGA.LUAD.sampleMap/HiSeqV2_percentile"
cli_dataset <- "TCGA.LUAD.sampleMap/LUAD_clinicalMatrix"
id <- "TP53"
cli_df <- XenaGenerate(
  subset = XenaDatasets == "TCGA.LUAD.sampleMap/LUAD_clinicalMatrix"
) %>%
  XenaQuery() %>%
  XenaDownload() %>%
  XenaPrepare()

# group data.frame with 2 columns
vis_identifier_grp_comparison(expr_dataset, id, cli_df[, c("sampleID", "gender")])
# group data.frame with 3 columns
vis_identifier_grp_comparison(
  expr_dataset, id,
  cli_df[, c("sampleID", "pathologic_M", "gender")] %>%
  dplyr::filter(pathologic_M %in% c("M0", "MX"))
)

# When not use the value of `identifier` from `dataset`
vis_identifier_grp_comparison(grp_df = cli_df[, c(1, 2, 71)])
vis_identifier_grp_comparison(grp_df = cli_df[, c(1, 2, 71, 111)])

## End(Not run)
```

---

```
vis_identifier_grp_surv
```

*Visualize Identifier Group Survival Difference*

---

**Description**

NOTE: the dataset must be dense matrix in UCSC Xena data hubs.

**Usage**

```
vis_identifier_grp_surv(
  dataset = NULL,
  id = NULL,
  surv_df,
  samples = NULL,
  cutoff_mode = c("Auto", "Custom", "None"),
  cutpoint = c(50, 50),
  palette = "aaas",
  ...
)
```

**Arguments**

dataset	the dataset to obtain identifiers.
id	the molecule identifier.
surv_df	a data.frame. The "time" should be in unit of "days". <ul style="list-style-type: none"> <li>• If there are 3 columns, the names should be "sample", "time", "status".</li> <li>• If there are 4 columns, the names should be "sample", "value", "time", "status".</li> </ul>
samples	default is NULL, can be common sample names for two datasets.
cutoff_mode	mode for grouping samples, can be "Auto" (default) or "Custom" or "None" (for groups have been prepared).
cutpoint	cut point (in percent) for "Custom" mode, default is c(50, 50).
palette	color palette, can be "hue", "grey", "RdBu", "Blues", "npg", "aaas", etc. More see ?survminer::ggsurvplot.
...	other parameters passing to survminer::ggsurvplot

**Value**

a (gg)plot object.

**Examples**

```
## Not run:
library(UCSCXenaTools)
expr_dataset <- "TCGA.LUAD.sampleMap/HiSeqV2_percentile"
cli_dataset <- "TCGA.LUAD.sampleMap/LUAD_clinicalMatrix"
id <- "KRAS"
cli_df <- XenaGenerate(
  subset = XenaDatasets == "TCGA.LUAD.sampleMap/LUAD_clinicalMatrix"
) %>%
  XenaQuery() %>%
  XenaDownload() %>%
  XenaPrepare()

# Use individual survival data
surv_df1 <- cli_df[, c("sampleID", "ABSOLUTE_Ploidy", "days_to_death", "vital_status")]
surv_df1$vital_status <- ifelse(surv_df1$vital_status == "DECEASED", 1, 0)
vis_identifier_grp_surv(surv_df = surv_df1)

# Use both dataset argument and vis_identifier_grp_surv(surv_df = surv_df1)
surv_df2 <- surv_df1[, c(1, 3, 4)]
vis_identifier_grp_surv(expr_dataset, id, surv_df = surv_df2)
vis_identifier_grp_surv(expr_dataset, id,
  surv_df = surv_df2,
  cutoff_mode = "Custom", cutpoint = c(25, 75)
)

## End(Not run)
```

---

`vis_identifier_multi_cor`*Visualize Correlation for Multiple Identifiers*

---

## Description

NOTE: the dataset must be dense matrix in UCSC Xena data hubs.

## Usage

```
vis_identifier_multi_cor(  
  dataset,  
  ids,  
  samples = NULL,  
  matrix.type = c("full", "upper", "lower"),  
  type = c("parametric", "nonparametric", "robust", "bayes"),  
  partial = FALSE,  
  sig.level = 0.05,  
  p.adjust.method = c("holm", "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr",  
    "none"),  
  color_low = "#E69F00",  
  color_high = "#009E73",  
  ...  
)
```

## Arguments

<code>dataset</code>	the dataset to obtain identifiers.
<code>ids</code>	the molecule identifiers.
<code>samples</code>	default is NULL, can be common sample names for two datasets.
<code>matrix.type</code>	Character, "upper" (default), "lower", or "full", display full matrix, lower triangular or upper triangular matrix.
<code>type</code>	A character specifying the type of statistical approach: <ul style="list-style-type: none"><li>• "parametric"</li><li>• "nonparametric"</li><li>• "robust"</li><li>• "bayes"</li></ul> You can specify just the initial letter.
<code>partial</code>	Can be TRUE for partial correlations. For Bayesian partial correlations, "full" instead of pseudo-Bayesian partial correlations (i.e., Bayesian correlation based on frequentist partialization) are returned.
<code>sig.level</code>	Significance level (Default: 0.05). If the $p$ -value in $p$ -value matrix is bigger than <code>sig.level</code> , then the corresponding correlation coefficient is regarded as insignificant and flagged as such in the plot. Relevant only when <code>output = "plot"</code> .

p.adjust.method Adjustment method for  $p$ -values for multiple comparisons. Possible methods are: "holm" (default), "hochberg", "hommel", "bonferroni", "BH", "BY", "fdr", "none".

color\_low the color code for lower value mapping.

color\_high the color code for higher value mapping.

... other parameters passing to [ggstatsplot::ggcormat](#).

**Value**

a (gg)plot object.

**Examples**

```
## Not run:
dataset <- "TcgaTargetGtex_rsem_isoform_tpm"
ids <- c("TP53", "KRAS", "PTEN")
vis_identifier_multi_cor(dataset, ids)

## End(Not run)
```

---

vis\_pancan\_anatomy      *Visualize Single Gene Expression in Anatomy Location*

---

**Description**

Visualize Single Gene Expression in Anatomy Location

**Usage**

```
vis_pancan_anatomy(
  Gene = "TP53",
  Gender = c("Female", "Male"),
  data_type = "mRNA",
  option = "D"
)
```

**Arguments**

Gene a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 \* KRAS - 1.3 \* PTEN").

Gender a string, "Female" (default) or "Male".

data\_type choose gene profile type, including "mRNA", "transcript", "methylation", "miRNA", "protein", "cnv\_gistic2".

option A character string indicating the colormap option to use. Four options are available: "magma" (or "A"), "inferno" (or "B"), "plasma" (or "C"), "viridis" (or "D", the default option) and "cividis" (or "E").



**Value**

a ggplot object

---

vis_pcawg_dist	<i>Visualize molecular profile in PCAWG</i>
----------------	---

---

**Description**

Visualize molecular profile in PCAWG

**Usage**

```
vis_pcawg_dist(
  Gene = "TP53",
  Mode = c("Boxplot", "Violinplot"),
  data_type = "mRNA",
  Show.P.value = TRUE,
  Show.P.label = TRUE,
  Method = c("wilcox.test", "t.test"),
  values = c("#DF2020", "#DDDF21"),
  draw_quantiles = c(0.25, 0.5, 0.75),
  trim = TRUE
)
```

**Arguments**

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
Mode	"Boxplot" or "Violinplot" to represent data
data_type	choose gene profile type, including "mRNA", "transcript", "protein", "mutation", "cnv" (-2, -1, 0, 1, 2), "cnv_gistic2", "methylation", "miRNA".
Show.P.value	TRUE or FALSE whether to count P value
Show.P.label	TRUE or FALSE present p value with number or label *, **, *** and ****
Method	default method is wilcox.test
values	the color to fill tumor or normal
draw_quantiles	draw quantiles for violinplot
trim	whether trim the violin

**Value**

a ggplot object

**Examples**

```
## Not run:
p <- vis_pcawg_dist(Gene = "TP53")

## End(Not run)
```

---

vis\_pcawg\_gene\_cor      *Visualize Gene-Gene Correlation in TCGA*

---

**Description**

Visualize Gene-Gene Correlation in TCGA

**Usage**

```
vis_pcawg_gene_cor(
  Gene1 = "CSF1R",
  Gene2 = "JAK3",
  data_type1 = "mRNA",
  data_type2 = "mRNA",
  cor_method = "spearman",
  purity_adj = TRUE,
  use_log_x = FALSE,
  use_log_y = FALSE,
  use_regline = TRUE,
  dcc_project_code_choose = "BLCA-US",
  use_all = FALSE,
  filter_tumor = TRUE,
  alpha = 0.5,
  color = "#000000"
)
```

**Arguments**

Gene1	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
Gene2	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
data_type1	choose gene profile type for the first gene, including "mRNA", "transcript", "methylation", "miRNA", "prote"
data_type2	choose gene profile type for the second gene, including "mRNA", "transcript", "methylation", "miRNA", "pr"
cor_method	correlation method
purity_adj	whether performing partial correlation adjusted by purity
use_log_x	if TRUE, log X values.
use_log_y	if TRUE, log Y values.

use_regline	if TRUE, add regression line.
dcc_project_code_choose	select project code.
use_all	use all sample, default FALSE.
filter_tumor	whether use tumor sample only, default TRUE
alpha	dot alpha.
color	dot color.

**Value**

a ggplot object

---

vis\_pcawg\_unicox\_tree *Visualize Single Gene Univariable Cox Result in PCAWG*

---

**Description**

Visualize Single Gene Univariable Cox Result in PCAWG

**Usage**

```
vis_pcawg_unicox_tree(
  Gene = "TP53",
  measure = "OS",
  data_type = "mRNA",
  threshold = 0.5,
  values = c("grey", "#E31A1C", "#377DB8")
)
```

**Arguments**

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
measure	a survival measure, e.g. "OS".
data_type	choose gene profile type, including "mRNA", "transcript", "methylation", "miRNA", "protein", "cnv_gistic2"
threshold	a expression cutoff, 0.5 for median.
values	the color to fill tumor or normal

**Value**

a ggplot object

**Examples**

```
## Not run:
p <- vis_pcawg_unicox_tree(Gene = "TP53")

## End(Not run)
```

---

vis_toil_TvsN	<i>Visualize Pan-cancer TPM (tumor (TCGA) vs Normal (TCGA &amp; GTEx))</i>
---------------	--

---

### Description

Visualize Pan-cancer TPM (tumor (TCGA) vs Normal (TCGA & GTEx))

### Usage

```
vis_toil_TvsN(
  Gene = "TP53",
  Mode = c("Boxplot", "Violinplot"),
  data_type = "mRNA",
  Show.P.value = TRUE,
  Show.P.label = TRUE,
  Method = c("wilcox.test", "t.test"),
  values = c("#DF2020", "#DDDF21"),
  TCGA.only = FALSE,
  draw_quantiles = c(0.25, 0.5, 0.75),
  trim = TRUE,
  include.Tumor.only = FALSE
)
```

### Arguments

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
Mode	"Boxplot" or "Violinplot" to represent data
data_type	choose gene profile type, including "mRNA", "transcript", "protein", "mutation", "cnv" (-2, -1, 0, 1, 2), "cnv_gistic2", "methylation", "miRNA".
Show.P.value	TRUE or FALSE whether to count P value
Show.P.label	TRUE or FALSE present p value with number or label *, **, *** and ****
Method	default method is wilcox.test
values	the color to fill tumor or normal
TCGA.only	include samples only from TCGA dataset
draw_quantiles	draw quantiles for violinplot
trim	whether trim the violin
include.Tumor.only	if TRUE, include "UVM" and "MESO" these two types with matched normals samples.

### Value

a ggplot object

**Examples**

```
## Not run:
p <- vis_toil_TvsN(Gene = "TP53", Mode = "Violinplot", Show.P.value = FALSE, Show.P.label = FALSE)
p <- vis_toil_TvsN(Gene = "TP53", Mode = "Boxplot", Show.P.value = FALSE, Show.P.label = FALSE)

## End(Not run)
```

---

vis\_toil\_TvsN\_cancer *Visualize Gene TPM in Single Cancer Type (Tumor (TCGA) vs Normal (TCGA & GTEx))*

---

**Description**

Visualize Gene TPM in Single Cancer Type (Tumor (TCGA) vs Normal (TCGA & GTEx))

**Usage**

```
vis_toil_TvsN_cancer(
  Gene = "TP53",
  Mode = c("Violinplot", "Dotplot"),
  data_type = "mRNA",
  Show.P.value = FALSE,
  Show.P.label = FALSE,
  Method = "wilcox.test",
  values = c("#DF2020", "#DDDF21"),
  TCGA.only = FALSE,
  Cancer = "ACC"
)
```

**Arguments**

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
Mode	"Boxplot" or "Violinplot" to represent data
data_type	choose gene profile type, including "mRNA", "transcript", "protein", "mutation", "cnv" (-2, -1, 0, 1, 2), "cnv_gistic2", "methylation", "miRNA".
Show.P.value	TRUE or FALSE whether to count P value
Show.P.label	TRUE or FALSE present p value with number or label *, **, *** and ****
Method	default method is wilcox.test
values	the color to fill tumor or normal
TCGA.only	include samples only from TCGA dataset
Cancer	select cancer cohort(s).

**Value**

a ggplot object.

---

`vis_unicox_tree`*Visualize Single Gene Univariable Cox Result from Toil Data Hub*

---

**Description**

Visualize Single Gene Univariable Cox Result from Toil Data Hub

**Usage**

```
vis_unicox_tree(  
  Gene = "TP53",  
  measure = "OS",  
  data_type = "mRNA",  
  threshold = 0.5,  
  values = c("grey", "#E31A1C", "#377DB8")  
)
```

**Arguments**

Gene	a molecular identifier (e.g., "TP53") or a formula specifying genomic signature ("TP53 + 2 * KRAS - 1.3 * PTEN").
measure	a survival measure, e.g. "OS".
data_type	choose gene profile type, including "mRNA", "transcript", "methylation", "miRNA", "protein", "cnv_gistic2".
threshold	a expression cutoff, 0.5 for median.
values	the color to fill tumor or normal

**Value**

a ggplot object

**Examples**

```
## Not run:  
p <- vis_unicox_tree(Gene = "TP53")  
  
## End(Not run)
```

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