

# Package ‘ieugwasr’

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**Title** Interface to the 'OpenGWAS' Database API

**Version** 1.0.1

**Description** Interface to the 'OpenGWAS' database API <<https://gwas-api.mrcieu.ac.uk/>>. Includes a wrapper to make generic calls to the API, plus convenience functions for specific queries.

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**URL** <https://github.com/MRCIEU/ieugwasr>,  
<https://mrcieu.github.io/ieugwasr/>

**BugReports** <https://github.com/MRCIEU/ieugwasr/issues>

**Depends** R (>= 4.0)

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---

af12_chrpos	<i>Look up allele frequencies and LD scores for 1000 genomes populations by chrpos</i>
-------------	--

---

### Description

Look up allele frequencies and LD scores for 1000 genomes populations by chrpos

### Usage

```
af12_chrpos(chrpos, reference = "1000g", opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

chrpos	list of <chr>:<pos> in build 37, e.g. c("3:46414943", "3:122991235"). Also allows ranges e.g "7:105561135-105563135"
reference	Default="1000g"
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

**Value**

Data frame containing ancestry specific LD scores and allele frequencies for each variant

---

af12_list	<i>Retrieve a allele frequency and LD scores for pre-defined lists of variants</i>
-----------	--

---

**Description**

Data frame includes 1000 genomes metadata including sample sizes, allele frequency and LD score, separated by 5 super populations (EUR = European, AFR = African, EAS = East Asian, AMR = Admixed American, SAS = South Asian)

**Usage**

```
af12_list(
  variantlist = c("reduced", "hapmap3")[1],
  opengwas_jwt = get_opengwas_jwt()
)
```

**Arguments**

variantlist	Choose pre-defined list. reduced = ~20k SNPs that are common in all super populations (default). hapmap3 = ~1.3 million hm3 SNPs
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

**Value**

Data frame containing ancestry specific LD scores and allele frequencies for each variant

---

afl2_rsid	<i>Look up allele frequencies and LD scores for 1000 genomes populations by rsid</i>
-----------	--

---

### Description

Look up allele frequencies and LD scores for 1000 genomes populations by rsid

### Usage

```
afl2_rsid(rsid, reference = "1000g", opengwas_jwt = get_opengwas_jwt())
```

### Arguments

rsid	Vector of rsids
reference	Default="1000g"
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

### Value

Data frame containing ancestry specific LD scores and allele frequencies for each variant

---

api_query	<i>Wrapper for sending queries and payloads to API</i>
-----------	--

---

### Description

There are a number of different GET and POST endpoints in the GWAS database API. This is a generic way to access them.

### Usage

```
api_query(
  path,
  query = NULL,
  opengwas_jwt = get_opengwas_jwt(),
  method = "GET",
  silent = TRUE,
  encode = "json",
  timeout = 300,
  override_429 = FALSE
)
```

**Arguments**

path	Either a full query path (e.g. for get) or an endpoint (e.g. for post) queries
query	If post query, provide a list of arguments as the payload. NULL by default
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviro under the keyname OPENGWAS_JWT.
method	"GET" (default) or "POST", "DELETE" etc
silent	TRUE/FALSE to be passed to httr call. TRUE by default
encode	Default = "json", see <a href="#">httr::POST</a> for options
timeout	Default = 300, avoid increasing this, preferentially simplify the query first.
override_429	Default=FALSE. If allowance is exceeded then the query will error before submitting a request to avoid getting blocked. If you are sure you want to submit the request then set this to TRUE.

**Value**

httr response object

---

api\_status

*MR-Base server status*

---

**Description**

MR-Base server status

**Usage**

api\_status()

**Value**

list of values regarding status

---

 associations
 

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---

*Query specific variants from specific GWAS*


---

### Description

Every rsid is searched for against each requested GWAS id. To get a list of available GWAS ids, or to find their meta data, use [gwasinfo](#). Can request LD proxies for instances when the requested rsid is not present in a particular GWAS dataset. This currently only uses an LD reference panel composed of Europeans in 1000 genomes version 3. It is also restricted to biallelic single nucleotide polymorphisms (no indels), with European MAF > 0.01.

### Usage

```
associations(
  variants,
  id,
  proxies = 1,
  r2 = 0.8,
  align_alleles = 1,
  palindromes = 1,
  maf_threshold = 0.3,
  opengwas_jwt = get_opengwas_jwt()
)
```

### Arguments

variants	Array of variants e.g. c("rs234", "7:105561135-105563135")
id	Array of GWAS studies to query. See <a href="#">gwasinfo</a> for available studies
proxies	0 or (default) 1 - indicating whether to look for proxies
r2	Minimum proxy LD rsq value. Default=0.8
align_alleles	Try to align tag alleles to target alleles (if proxies = 1). 1 = yes (default), 0 = no
palindromes	Allow palindromic SNPs (if proxies = 1). 1 = yes (default), 0 = no
maf_threshold	MAF threshold to try to infer palindromic SNPs. Default = 0.3.
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviro under the keyname OPENGWAS_JWT.

### Value

Dataframe

---

batches	<i>Get list of data batches in IEU GWAS database</i>
---------	--

---

**Description**

Get list of data batches in IEU GWAS database

**Usage**

```
batches(opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.
--------------	--

**Value**

data frame

---

batch_from_id	<i>Extract batch name from study ID</i>
---------------	---

---

**Description**

Extract batch name from study ID

**Usage**

```
batch_from_id(id)
```

**Arguments**

id	Array of study IDs
----	--------------------

**Value**

Array of batch names

---

check_access_token	<i>Check if authentication has been maded</i>
--------------------	---

---

**Description**

Deprecated. Use `get_opengwas_jwt()` instead. See <https://mrcieu.github.io/ieugwasr/articles/guide.html#authentication> for more information.

**Usage**

```
check_access_token()
```

**Value**

NULL or `access_token` depending on current authentication state

---

check_reset	<i>Check if OpenGWAS allowance needs to be reset</i>
-------------	--

---

**Description**

This function checks if a recent query indicated that the OpenGWAS allowance has been used up. To prevent the IP being blocked, it will error if the new query is being submitted before the reset time. If the allowance has been used up, it displays a message indicating the time when the allowance will be reset. By default, the function will throw an error if the allowance has been used up, but this behavior can be overridden by setting `override_429` to TRUE.

**Usage**

```
check_reset(override_429 = FALSE)
```

**Arguments**

<code>override_429</code>	Logical value indicating whether to override the allowance reset check (default: FALSE)
---------------------------	---



---

editcheck	<i>Check datasets that are in process of being uploaded</i>
-----------	---

---

**Description**

Check datasets that are in process of being uploaded

**Usage**

```
editcheck(id, opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

id	ID
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

**Value**

Dataframe

---

fill_n	<i>Look up sample sizes when meta data is missing from associations</i>
--------	---

---

**Description**

Look up sample sizes when meta data is missing from associations

**Usage**

```
fill_n(d, opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

d	Output from <a href="#">associations</a>
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

**Value**

Updated version of d

---

get_opengwas_jwt	<i>Retrieve OpenGWAS JSON Web Token from .Renviron file</i>
------------------	---

---

**Description**

Retrieve OpenGWAS JSON Web Token from .Renviron file

**Usage**

```
get_opengwas_jwt()
```

**Value**

JWT string

---

get_query_content	<i>Parse out json response from httr object</i>
-------------------	---

---

**Description**

Parse out json response from httr object

**Usage**

```
get_query_content(response)
```

**Arguments**

response	Output from httr
----------	------------------

**Value**

Parsed json output from query, often in form of data frame. If status code is not successful then return the actual response

---

gwasinfo	<i>Get list of studies with available GWAS summary statistics through API</i>
----------	---

---

**Description**

Get list of studies with available GWAS summary statistics through API

**Usage**

```
gwasinfo(id = NULL, opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

id	List of MR-Base IDs to retrieve. If NULL (default) retrieves all available datasets
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

**Value**

Dataframe of details for all available studies

---

infer_ancestry	<i>Infer ancestry of GWAS dataset by matching against 1000 genomes allele frequencies</i>
----------------	---

---

**Description**

Uses ~20k SNPs selected for common frequency across 5 major super populations

**Usage**

```
infer_ancestry(d, snpinfo = NULL, opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

d	Data frame containing at least rsid and eaf columns. e.g. output from associations
snpinfo	Output from <a href="#">af12_list</a> , <a href="#">af12_rsid</a> or <a href="#">af12_chrpos</a> . If NULL then <a href="#">af12_list()</a> is used by default
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

**Value**

data frame ordered by most likely ancestry, each row represents a super population and cor column represents the correlation between the GWAS dataset and the 1000 genomes super population allele frequencies

---

ld_clump	<i>Perform LD clumping on SNP data</i>
----------	--

---

**Description**

Uses PLINK clumping method, where SNPs in LD within a particular window will be pruned. The SNP with the lowest p-value is retained.

**Usage**

```
ld_clump(
  dat = NULL,
  clump_kb = 10000,
  clump_r2 = 0.001,
  clump_p = 0.99,
  pop = "EUR",
  opengwas_jwt = get_opengwas_jwt(),
  bfile = NULL,
  plink_bin = NULL
)
```

**Arguments**

dat	Dataframe. Must have a variant name column (rsid) and pval column called pval. If id is present then clumping will be done per unique id.
clump_kb	Clumping kb window. Default is very strict, 10000
clump_r2	Clumping r2 threshold. Default is very strict, 0.001
clump_p	Clumping sig level for index variants. Default = 1 (i.e. no threshold)
pop	Super-population to use as reference panel. Default = "EUR". Options are "EUR", "SAS", "EAS", "AFR", "AMR". 'legacy' also available - which is a previously used version of the EUR panel with a slightly different set of markers
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.#'
bfile	If this is provided then will use the API. Default = NULL
plink_bin	If NULL and bfile is not NULL then will detect packaged plink binary for specific OS. Otherwise specify path to plink binary. Default = NULL

**Details**

This function interacts with the OpenGWAS API, which houses LD reference panels for the 5 super-populations in the 1000 genomes reference panel. It includes only bi-allelic SNPs with MAF > 0.01, so it's quite possible that a variant you want to include in the clumping process will be absent. If it is absent, it will be automatically excluded from the results.

You can check if your variants are present in the LD reference panel using `ld_reflookup()`.

This function does put load on the OpenGWAS servers, which makes life more difficult for other users. We have implemented a method and made available the LD reference panels to perform clumping locally, see `ld_clump()` and related vignettes for details.

**Value**

Data frame

---

ld_clump_api	<i>Perform clumping on the chosen variants using through API</i>
--------------	--

---

**Description**

Perform clumping on the chosen variants using through API

**Usage**

```
ld_clump_api(
  dat,
  clump_kb = 10000,
  clump_r2 = 0.1,
  clump_p,
  pop = "EUR",
  opengwas_jwt = get_opengwas_jwt()
)
```

**Arguments**

dat	Dataframe. Must have a variant name column ( <code>variant</code> ) and pval column called <code>pval</code> . If <code>id</code> is present then clumping will be done per unique <code>id</code> .
clump_kb	Clumping kb window. Default is very strict, 10000
clump_r2	Clumping r2 threshold. Default is very strict, 0.001
clump_p	Clumping sig level for index variants. Default = 1 (i.e. no threshold)
pop	Super-population to use as reference panel. Default = "EUR". Options are "EUR", "SAS", "EAS", "AFR", "AMR"
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in <code>.Renviron</code> under the keyname <code>OPENGWAS_JWT.#'</code> @param bfile If this is provided then will use the API. Default = NULL

**Value**

Data frame of only independent variants

---

ld_clump_local	<i>Wrapper for clump function using local plink binary and ld reference dataset</i>
----------------	---

---

**Description**

Wrapper for clump function using local plink binary and ld reference dataset

**Usage**

```
ld_clump_local(dat, clump_kb, clump_r2, clump_p, bfile, plink_bin)
```

**Arguments**

dat	Dataframe. Must have a variant name column (variant) and pval column called pval. If id is present then clumping will be done per unique id.
clump_kb	Clumping kb window. Default is very strict, 10000
clump_r2	Clumping r2 threshold. Default is very strict, 0.001
clump_p	Clumping sig level for index variants. Default = 1 (i.e. no threshold)
bfile	If this is provided then will use the API. Default = NULL
plink_bin	Specify path to plink binary. Default = NULL. See <a href="https://github.com/explodecomputer/plinkbin">https://github.com/explodecomputer/plinkbin</a> for convenient access to plink binaries

**Value**

data frame of clumped variants

---

ld_matrix	<i>Get LD matrix for list of SNPs</i>
-----------	---------------------------------------

---

**Description**

This function takes a list of SNPs and searches for them in a specified super-population in the 1000 Genomes phase 3 reference panel. It then creates an LD matrix of r values (signed, and not squared). All LD values are with respect to the major alleles in the 1000G dataset. You can specify whether the allele names are displayed.

## Usage

```
ld_matrix(  
  variants,  
  with_alleles = TRUE,  
  pop = "EUR",  
  opengwas_jwt = get_opengwas_jwt(),  
  bfile = NULL,  
  plink_bin = NULL  
)
```

## Arguments

variants	List of variants (rsids)
with_alleles	Whether to append the allele names to the SNP names. Default: TRUE
pop	Super-population to use as reference panel. Default = "EUR". Options are "EUR", "SAS", "EAS", "AFR", "AMR". 'legacy' also available - which is a previously used version of the EUR panel with a slightly different set of markers
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.#' @param bfile If this is provided then will use the API. Default = NULL
bfile	If this is provided then will use the API. Default = NULL
plink_bin	If NULL and bfile is not NULL then will detect packaged plink binary for specific OS. Otherwise specify path to plink binary. Default = NULL

## Details

The data used for generating the LD matrix includes only bi-allelic SNPs with MAF > 0.01, so it's quite possible that a variant you want to include will be absent. If it is absent, it will be automatically excluded from the results.

You can check if your variants are present in the LD reference panel using [ld\\_reflookup\(\)](#)

This function does put load on the OpenGWAS servers, which makes life more difficult for other users, and has been limited to analyse only up to 500 variants at a time. We have implemented a method and made available the LD reference panels to perform the operation locally, see [ld\\_matrix\(\)](#) and related vignettes for details.

## Value

Matrix of LD r values

---

ld_matrix_local	<i>Get LD matrix using local plink binary and reference dataset</i>
-----------------	---

---

**Description**

Get LD matrix using local plink binary and reference dataset

**Usage**

```
ld_matrix_local(variants, bfile, plink_bin, with_alleles = TRUE)
```

**Arguments**

variants	List of variants (rsids)
bfile	Path to bed/bim/fam ld reference panel
plink_bin	Specify path to plink binary. Default = NULL. See <a href="https://github.com/explodecomputer/plinkbin">https://github.com/explodecomputer/plinkbin</a> for convenient access to plink binaries
with_alleles	Whether to append the allele names to the SNP names. Default: TRUE

**Value**

data frame

---

ld_reflookup	<i>Check which rsids are present in a remote LD reference panel</i>
--------------	---

---

**Description**

Provide a list of rsids that you may want to perform LD operations on to check if they are present in the LD reference panel. If they are not then some functions e.g. [ld\\_clump](#) will exclude them from the analysis, so you may want to consider how to handle those variants in your data.

**Usage**

```
ld_reflookup(rsid, pop = "EUR", opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

rsid	Array of rsids to check
pop	Super-population to use as reference panel. Default = "EUR". Options are "EUR", "SAS", "EAS", "AFR", "AMR"
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.#' @param bfile If this is provided then will use the API. Default = NULL



**Value**

Array of rsids that are present in the LD reference panel

---

legacy_ids	<i>Convert current IDs to legacy IDs</i>
------------	--

---

**Description**

Convert current IDs to legacy IDs

**Usage**

```
legacy_ids(x)
```

**Arguments**

x                    Vector of ids

**Value**

vector of back compatible ids

---

logging_info	<i>Details of how access token logs are used</i>
--------------	--

---

**Description**

Details of how access token logs are used

**Usage**

```
logging_info()
```

**Value**

No return value, called for side effects

---

phewas	<i>Perform fast phewas of a specific variants against all available GWAS datasets</i>
--------	---

---

### Description

This is faster than doing it manually through [associations](#)

### Usage

```
phewas(variants, pval = 1e-05, batch = c(), opengwas_jwt = get_opengwas_jwt())
```

### Arguments

variants	Array of variants e.g. <code>c("rs234", "7:105561135-105563135")</code>
pval	p-value threshold. Default = <code>0.00001</code>
batch	Vector of batch IDs to search across. If <code>c()</code> (default) then returns all batches
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in <code>.Renviron</code> under the keyname <code>OPENGWAS_JWT</code> .

### Value

Dataframe

---

print.ApiStatus	<i>Print API status</i>
-----------------	-------------------------

---

### Description

Print API status

### Usage

```
## S3 method for class 'ApiStatus'
print(x, ...)
```

### Arguments

x	Output from <a href="#">api_status</a>
...	Unused, for extensibility

### Value

Print out of API status

---

print.GwasInfo	<i>Print GWAS information</i>
----------------	-------------------------------

---

**Description**

Print GWAS information

**Usage**

```
## S3 method for class 'GwasInfo'
print(x, ...)
```

**Arguments**

x	Output from <a href="#">gwasinfo</a>
...	Unused, for extensibility

**Value**

Print out of GWAS information

---

select_api	<i>Toggle API address between development and release</i>
------------	---

---

**Description**

Toggle API address between development and release

**Usage**

```
select_api(where = "public", silent = FALSE)
```

**Arguments**

where	Which API to use. Choice between "public", "private", "dev1", "dev2". Default = "public".
silent	Silent? Default = FALSE

**Value**

No return value, called for side effects

---

set_reset	<i>Set the reset time for OpenGWAS allowance</i>
-----------	--

---

**Description**

This function sets the reset time for the OpenGWAS allowance based on the retry-after header returned by the API response. It also displays a warning message indicating the time at which the allowance will reset.

**Usage**

```
set_reset(r)
```

**Arguments**

r	The API response object
---	-------------------------

**Value**

None

---

tophits	<i>Obtain top hits from a GWAS dataset</i>
---------	--

---

**Description**

By default performs clumping on the server side.

**Usage**

```
tophits(  
  id,  
  pval = 5e-08,  
  clump = 1,  
  r2 = 0.001,  
  kb = 10000,  
  pop = "EUR",  
  force_server = FALSE,  
  opengwas_jwt = get_opengwas_jwt()  
)
```

**Arguments**

id	Array of GWAS studies to query. See <a href="#">gwasinfo</a> for available studies
pval	use this p-value threshold. Default = 5e-8
clump	whether to clump (1) or not (0). Default = 1
r2	use this clumping r2 threshold. Default is very strict, 0.001
kb	use this clumping kb window. Default is very strict, 10000
pop	Super-population to use as reference panel. Default = "EUR". Options are "EUR", "SAS", "EAS", "AFR", "AMR"
force_server	Logical. By default will return preclumped hits. p-value threshold 5e-8, with r2 threshold 0.001 and kb threshold 10000, using only SNPs with MAF > 0.01 in the European samples in 1000 genomes. If force_server = TRUE then will recompute using server side LD reference panel.
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

**Value**

Dataframe

---

user	<i>Get user details</i>
------	-------------------------

---

**Description**

Get user details

**Usage**

```
user(opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.
--------------	--

**Value**

user information

---

variants_chrpos	<i>Obtain information about chr pos and surrounding region</i>
-----------------	--

---

**Description**

For a list of chromosome and positions, finds all variants within a given radius

**Usage**

```
variants_chrpos(chrpos, radius = 0, opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

chrpos	list of <chr>:<pos> in build 37, e.g. c("3:46414943", "3:122991235"). Also allows ranges e.g. "7:105561135-105563135"
radius	Radius around each chrpos, default = 0
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

**Value**

Data frame

---

variants_gene	<i>Obtain variants around a gene</i>
---------------	--------------------------------------

---

**Description**

Provide a gene identified, either Ensembl or Entrez

**Usage**

```
variants_gene(gene, radius = 0, opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

gene	Vector of genes, either Ensembl or Entrez, e.g. c("ENSG00000123374", "ENSG00000160791") or 1017
radius	Radius around the gene region to include. Default = 0
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

**Value**

data frame with the following columns

---

variants_rsid	<i>Obtain information about rsid</i>
---------------	--------------------------------------

---

**Description**

Obtain information about rsid

**Usage**

```
variants_rsid(rsid, opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

rsid	Vector of rsids
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

**Value**

data frame

---

variants_to_rsid	<i>Convert mixed array of rsid and chrpos to list of rsid</i>
------------------	---

---

**Description**

Convert mixed array of rsid and chrpos to list of rsid

**Usage**

```
variants_to_rsid(variants, opengwas_jwt = get_opengwas_jwt())
```

**Arguments**

variants	Array of variants e.g. c("rs234", "7:105561135-105563135")
opengwas_jwt	Used to authenticate protected endpoints. Login to <a href="https://api.opengwas.io">https://api.opengwas.io</a> to obtain a jwt. Provide the jwt string here, or store in .Renviron under the keyname OPENGWAS_JWT.

**Value**

list of rsids

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