
V_hostDB Documentation

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About Virus-Host DataBase.

Virus-Host is a database providing information for the virus and its hosts' relationships. It covers viruses with only complete genomes stored in NCBI/RefSeq and GenBank whose accession numbers are listed in EBI Genomes. For more information see: <https://www.genome.jp/virushostdb/note.html>

For the number of viruses in the database and more statistics see : <https://www.genome.jp/virushostdb/stat.html>

1.1 Copyright and disclaimer for the Database.

Virus-Host DB is an original database product, copyright Laboratory of Chemical Life Science.

1.2 Citation for the Database.

Mihara, T., Nishimura, Y., Shimizu, Y., Nishiyama, H., Yoshikawa, G., Uehara, H., Hingamp, P., Goto, S., and Ogata, H.; Linking virus genomes with host taxonomy. *Viruses* 8, 66 doi:10.3390/v8030066 (2016).

CHAPTER 2

Statement of need

BioVirusHost is a simple Python interface to query the information from Virus-Host DB. Virus-Host DB provides a collection of viruses and their host information, and it is the biggest database for now (see : <https://www.genome.jp/virushostdb/stat.html>).

The need to access the information from the Virus-Host DB in a simple pythonic way is very useful for collecting data about viruses and hosts. BioVirusHost is a package that allows connecting to the Virus-Host DB API and parses information from it.

Virus-Host DB does not provide API documentation or examples, hence BioVirusHost was developed to connect, get, and parse information fast and easy.

3.1 Example 1

Search for virus hosts by virus scientific name.

```
for i_result in BioVirusHost.v_search(["Caprine parainfluenza virus 3","Human parainfluenza virus 1 strain Washington 1199",  
                                     print (i_result)
```

This will return generator object for Data frame(s) contains (virus (species) name, virus lineage, hostname, and host lineage).

3.2 Example 2

Search for virus hosts by host scientific name.

```
for i_result in BioVirusHost.h_search(["Abutilon","Abelmoschus manihot"]): print (i_result)
```

This will return a generator object for Data frame(s) contains (virus (species) name, virus lineage, hostname, and host lineage).

3.3 Example 3

Search for virus hosts by virus TAX id.

```
for i_result in BioVirusHost.v_tax_search([443876,438782]): print (i_result)
```

This will return generator object for Data frame(s) contains (virus (species) name, virus lineage, hostname, and host lineage).

3.4 Example 4

Search for virus hosts by host tax id.

```
for i_result in BioVirusHost.h_tax_search([183220,3630]): print(i_result)
```

This will return a generator object for Data frame(s) contains (virus (species) name, virus lineage, hostname, and host lineage).

3.5 Example 5

Advanced search for virus hosts using virus lineage and a specific host.

```
for i_result in BioVirusHost.comp_query("phasianinae","adenoviridae"): print(i_result)
```

This will return a generator object for Data frame(s) contains (virus (species) name, virus lineage, hostname, and host lineage).

3.6 Example 6

Get more information about the virus or its host.

This will return:

1- A data frame contains information about a virus (only) as genome type if host_info = False (default).

```
print(BioVirusHost.more_info("318490", "A.N.Other@example.com"))
```

2- A generator object for Data frame(s) contains information about hosts (only), if host_info = T.

```
for i_result in BioVirusHost.more_info("318490", "A.N.Other@example.com",True): print(i_result)
```

CHAPTER 4

Dependencies

- pandas
- Biopython

CHAPTER 5

Installation

Using pip:

```
pip install BioVirusHost
```


CHAPTER 6

Contribution Guidelines

To report bugs or seek support please open an issue on this repository. Contributions to the software are welcome; please open an issue for further discussion on github: .

CHAPTER 7

Help

If you need more help please contact ali.mo.anwar@std.agr.cu.edu.eg.

MIT License

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BioVirusHost module

`BioVirusHost.comp_query(host, virus_lineage)`

Advanced search for virus hosts using virus lineage and a specific host

Parameters

- **host** (*str*) – target host name or tax id
- **virus_lineage** (*str*) – virus lineage

Returns A generator object for Data frame(s) contains (virus (species) name, virus lineage, host name, and host lineage)

Raises

- `TypeError` if argument (host) is not a str
- `TypeError` if argument (virus_lineage) is not a str

`BioVirusHost.h_search(h_query)`

Search for virus hosts by host scientific name

Parameters **v_query** (*list*) – list of host(s) scientific name

Returns A generator object for Data frame(s) contains (virus (species) name, virus lineage, host name, and host lineage)

Raises `TypeError` if argument (h_query) is not a list

`BioVirusHost.h_tax_search(tax_query)`

Search for virus hosts by host tax id

Parameters **tax_query** (*list*) – list of host(s) tax id

Returns A generator object for Data frame(s) contains (virus (species) name, virus lineage, host name, and host lineage)

Raises `TypeError` if argument (tax_query) is not a list

`BioVirusHost.more_info(v_query, email, host_info=False)`

Get more information about the virus or its host

Parameters

- **v_query** (*str* or *int*) – target virus name or tax id
- **email** (*str*) – your email address, required by the NCBI server
- **host_info** (*bool*) – default = False

Returns

A dataframe contains information about a virus (only) as genome type, if host_info = False (default)

A generator object for Data frame(s) contains information about hosts (only), if host_info = True

Raises

- TypeError if argument (v_query) is not a str
- TypeError if argument (email) is not a str

BioVirusHost.**v_search** (*v_query*)

Search for virus hosts by virus scientific name

Parameters **v_query** (*list*) – list of virus(es) scientific name

Returns A generator object for Data frame(s) contains (virus (species) name, virus lineage, host name, and host lineage)

Raises TypeError if argument (v_query) is not a list

BioVirusHost.**v_tax_search** (*tax_query*)

Search for virus hosts by virus TAX id

Parameters **tax_query** (*list*) – list of virus(s) TAX id

Returns A generator object for Data frame(s) contains (virus (species) name, virus lineage, host name, and host lineage)

Raises TypeError if argument (tax_query) is not a list

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