

# Package ‘AnnotationHub’

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**Type** Package

**Title** A client for retrieving Bioconductor objects from AnnotationHub

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**Suggests** RUnit, RCurl, Rsamtools

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**Description** A client for retrieving data from the Bioconductor AnnotationHub online services.

**Collate** AllGenerics.R Constants.R hubUtils.R hubCache.R filter.R  
completion.R getResource.R AnnotationHub-class.R  
test\_AnnotationHub\_package.R dynObjHelp.R display.R zzz.R

**License** Artistic-2.0

**biocViews** Annotation, Infrastructure

**LazyLoad** yes

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## Description

AnnotationHub is the base class for interacting with the AnnotationHub services using Bioconductor. When using the AnnotationHub package, users will create an instance of this class and then apply filters on it in order to narrow down their annotation options to an amount that a human can reasonably look at.

Once an AnnotationHub is created, the user can see what resources are available by tab completion using the \$ argument. But before doing that, it is usually a good idea to use the filters method to set some restrictions.

What kind of restrictions? Well those can be listed by using the columns and keys methods to list them. Possible values for those can be found by using keys.

Once this is determined, a list object can be assigned using filters<-. The list needs to be named after values returned by the columns and keys methods, and to contain character vectors that contain results from the matching keys method.

All AnnotationHub have a snapshot date that by default is set to the most recent one. The snapshotDate method indicates which one is in use, but this value can also be set to previous dates.

Whenever you download a file from AnnotationHub it will automatically put the data in a local cache for future reference. The location of this cache can be found and even changed with the hubCache setters and getters. This cache provides a performance boost for users but it does not mean that you can use this on a plane without needing wireless access.

## Usage

```

filters(x, ...)
filters(x, ...) <- value
hubUrl(x, ...)
hubCache(x, ...)
hubCache(x, ...) <- value
hubResource(x, path = character(), ...)
possibleDates(x, ...)
snapshotDate(x, ...)
snapshotDate(x, ...) <- value
snapshotUrl(x, ...)
snapshotUrls(x, ...)
snapshotVersion(x, ...)
columns(x)
## S4 method for signature AnnotationHub
metadata(x, columns, ..., cols)
keytypes(x)
keys(x, keytype, ...)
ahinfo(x, path)
display(object,...)

```

**Arguments**

<code>x</code>	the AnnotationHub object.
<code>object</code>	the AnnotationHub object.
<code>value</code>	the value to be assigned. For <code>filters</code> method, this is a named list where the names are the kind of filters, and the values are character vectors of acceptable values
<code>path</code>	a path string
<code>columns, cols</code>	character vector of desired columns. <code>cols</code> is deprecated; use <code>columns</code> instead.
<code>keytype</code>	the type of key you want to look up possible values for
<code>...</code>	other arguments

**Methods**

In the code snippets below, `x` is an AnnotationHub object.

`filters(x, ...)` and `filters(x, ...) <- value`: Methods for listing and setting a list of filters for the AnnotationHub.

`hubUrl(x, ...)`: Gets the URL for the main hub.

`hubCache(x, ...)` and `hubCache(x, ...) <- value`: Gets or sets the hub cache location.

`possibleDates(x, ...)`: Lists dates for snapshots that the hub could potentially use.

`snapshotDate(x)` and `snapshotDate(x, ...) <- value`: Gets or sets the date for the snapshot in use.

`snapshotUrl(x, ...)`: Gives the base URL for this current snapshot.

`snapshotUrls(x, ...)`: Gives the individual URLs for all the snapshot resources.

`snapshotVersion(x, ...)`: shows the snapshot version in use.

`columns(x)` and `keytypes(x)`: shows which kinds of filters can be set for an AnnotationHub object.

`metadata(x, columns, ..., cols)`: Retrieve metadata about all resources in the AnnotationHub `x`. The optional `columns` argument is a subset of values returned by `columns(x)`; `cols` is deprecated and should not be used.

`keys(x, keytype, ...)`: Lists potential values for the filters of an AnnotationHub object. Use the `keytype` argument to specify which kind of filter.

`ahinfo(x, path)`: Shows metadata about an AnnotationHub resource and returns a DataFrame with that data.

`as.list(x, ...)`: Returns all the resources in the AnnotationHub as elements in a list object.

`display(object, ...)`: Implements the `display` generic from `interactiveDisplay` package. Users can select metadata rows from a web interface, the values in the rows selected by the user become filters applied to the AnnotationHub object.

**Author(s)**

Marc Carlson

**Examples**

```
## create an AnnotationHub object
library(AnnotationHub)
ah = AnnotationHub()

## what is the version of this snapshot?
snapshotVersion(ah)

## and what is the date we are using?
snapshotDate(ah)

## how many resources?
length(ah)

## list currently active filters
filters(ah)

## list values that can be used to filter on:
columns(ah)
keytypes(ah)

## list possible values for one of these filter types
head(keys(ah, keytype="Species"))

## OR retrieve metadata values about several keys at once
## (This approach may not always scale the way you want it to)
metadata(ah, columns = c("Species", "RDataPath"))

## create and apply a new filter to only include people
filters(ah) <- list(Species="Homo sapiens")

## now how many resources are there?
length(ah)

## what are the names for these resources?
head(names(ah))

## What are the URLs for these resources?
head(snapshotUrls(ah))

## what web service is this AnnotationHub pointing to?
hubUrl()
## and more explicitly
snapshotUrl()

## Where are the files that get downloaded being cached?
## (there is also a setter if you wish to assign this to another location)
hubCache(ah)

## Download a resource (using tab completion) and put it into "res"
res <- ah$goldenpath.hg19.encodeDCC.wgEncodeUwTfbs.wgEncodeUwTfbsMcf7CtcfStdPkRep1.narrowPeak_0.0.1.RData
```

```
## For brevity, lets define a resource pathname we are interested in
pathName <- "goldenpath.hg19.encodeDCC.wgEncodeUwTfbs.wgEncodeUwTfbsMcf7CtcfStdPkRep1.narrowPeak_0.0.1.RData"

## We can get metadata information about that resource:
ahinfo(ah, pathName)

## Or we can extract it by name like this (using a list semantic):
res <- ah[[pathName]]

## And we can also use "[" restrict the things that are in the
## AnnotationHub object. Either by position:
subHub <- ah[1:3]

## Or by name
subHub <- ah[pathName]

## So if I have many things to extract, I could do something like this:
pathNames <- c(pathName, "goldenpath.hg19.database.oreganno_0.0.1.RData")
res <- list()
for(i in pathNames){
  res[[i]] <- ah[[i]]
}

## OR those values can be extracted to a list like this (we recommend
## that you only download what you need)
subHub <- ah[pathNames]
res <- as.list(subHub)

if(interactive()) {
  ## Display method involves user interaction through web interface
  ah2 <- display(ah)
}
```

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