Package: TCIApathfinder (via r-universe)

September 12, 2024

Title Client for the Cancer Imaging Archive REST API

Version 1.0.7

Description A wrapper for The Cancer Imaging Archive's REST API. The
Cancer Imaging Archive (TCIA) hosts de-identified medical
images of cancer available for public download, as well as rich
metadata for each image series. TCIA provides a REST API for
programmatic access to the data. This package provides simple
functions to access each API endpoint. For more information,
see <https://github.com/pamelarussell/TCIApathfinder> and
TCIA's website.

Depends R (>= 3.4.0)

License MIT + file LICENSE

Encoding UTF-8

LazyData true

Imports httr, jsonlite

BugReports https://github.com/pamelarussell/TCIApathfinder/issues

URL https://github.com/pamelarussell/TCIApathfinder

RoxygenNote 7.1.1

Suggests knitr, rmarkdown, oro.dicom, testthat

VignetteBuilder knitr

Repository https://pamelarussell.r-universe.dev

RemoteUrl https://github.com/pamelarussell/tciapathfinder

RemoteRef HEAD

RemoteSha 3b73302e192a5650237ac9fda16c3ab4dcc99b48

Contents

get_body_part_names   *Get body part names*

Description

Get body part names

Usage

```
get_body_part_names(collection = NULL, modality = NULL)
```

Arguments

collection	TCIA collection name. If collection is NULL, body part names from all collections will be returned. To get a list of available collection names, call get_collection_names.
modality	Modality name. If modality is NULL, body part names from all modalities will be returned. To get a list of available modality names, call get_modality_names or see DICOM Modality Abbreviations.

Value

List containing elements:

- body_parts: character vector of body part names

- content: parsed API response content

- response: API response

See Also

get_collection_names, get_modality_names, DICOM Modality Abbreviations, TCIA REST API Usage Guide, TCIA API object definitions

Examples

```
## Not run:
get_body_part_names()
get_body_part_names(collection = "TCGA-BRCA")
get_body_part_names(modality = "MR")
get_body_part_names(collection = "TCGA-BRCA", modality = "MR")

## End(Not run)
```

---

get_collection_names   *Get the names of all TCIA collections*

Description

Get the names of all TCIA collections

Usage

```
get_collection_names()
```

Value

List containing elements:

- collection_names: character vector of TCIA collection names

- content: parsed API response content

- response: API response

See Also

[TCIA REST API Usage Guide, TCIA API object definitions](#)

Examples

```
## Not run:
get_collection_names()

## End(Not run)
```

get_manufacturer_names

Get manufacturer names

Description

Get manufacturer names

Usage

```
get_manufacturer_names(collection = NULL, modality = NULL, body_part = NULL)
```

Arguments

collection	TCIA collection name. If `collection` is NULL, manufacturer names from all collections will be returned. To get a list of available collection names, call `get_collection_names`.
modality	Modality name. If `modality` is NULL, manufacturer names for all modalities will be returned. To get a list of available modality names, call `get_modality_names` or see DICOM Modality Abbreviations.
body_part	Body part name. If `body_part` is NULL, manufacturer names for all body parts will be returned. To get a list of available body part names, call `get_body_part_names`.

Value

List containing elements:

- `manufacturer_names`: character vector of manufacturer names
- `content`: parsed API response content
- `response`: API response

See Also

`get_collection_names`, `get_modality_names`, `get_body_part_names`, DICOM Modality Abbreviations, TCIA REST API Usage Guide, TCIA API object definitions

Examples

```
## Not run:
get_manufacturer_names()
get_manufacturer_names(collection = "TCGA-BRCA")
get_manufacturer_names(collection = "TCGA-BRCA", modality = "MR", body_part = "BREAST")

## End(Not run)
```

---

get_modality_names   *Get modality names*

Description

Get modality names

Usage

```
get_modality_names(collection = NULL, body_part = NULL)
```

Arguments

collection	TCIA collection name. If collection is NULL, modality names from all collections will be returned. To get a list of available collection names, call get_collection_names.
body_part	Body part name. If body_part is NULL, modality names for all body parts will be returned. To get a list of available body part names, call get_body_part_names.

Value

List containing elements:

- modalities: character vector of modality names
- content: parsed API response content
- response: API response

See Also

get_collection_names, get_body_part_names, TCIA REST API Usage Guide, TCIA API object definitions

Examples

```
## Not run:
get_modality_names()
get_modality_names(collection = "TCGA-BRCA")
get_modality_names(body_part = "BREAST")
get_modality_names(collection = "TCGA-BRCA", body_part = "BREAST")

## End(Not run)
```

---

get_new_patients_in_collection

> *Get IDs of patients that have been added to a collection since a speci-*
> *fied date*

Description

Get IDs of patients that have been added to a collection since a specified date

Usage

```
get_new_patients_in_collection(collection, date)
```

Arguments

collection   TCIA collection name. To get a list of available collection names, call `get_collection_names`.

date   Date in format "YYYY-MM-DD"

Value

List containing elements:

- patient_ids: Patient IDs

- content: parsed API response content

- response: API response

See Also

`get_collection_names`, TCIA REST API Usage Guide, TCIA API object definitions

Examples

```
## Not run:
get_new_patients_in_collection("TCGA-BRCA", "2014-01-01")

## End(Not run)
```

get_new_studies_in_collection

Get studies that have been added to a collection and optionally to a patient since a specified date

Description

Get studies that have been added to a collection and optionally to a patient since a specified date

Usage

```
get_new_studies_in_collection(collection, date, patient_id = NULL)
```

Arguments

collection   TCIA collection name. To get a list of available collection names, call get_collection_names.

date   Date in format "YYYY-MM-DD"

patient_id   Patient ID. To get a list of available patient IDs, call get_patient_info. If patient_id is NULL, relevant studies for all patients in the collection will be returned.

Value

List containing elements:

- studies: Data frame of collection, patient ID, and study instance UID

- content: parsed API response content

- response: API response

See Also

get_collection_names, get_patient_info, TCIA REST API Usage Guide, TCIA API object definitions

Examples

```
## Not run:
get_new_studies_in_collection("TCGA-BRCA", "2014-01-01")
get_new_studies_in_collection("TCGA-BRCA", "2014-01-01", "TCGA-OL-A66O")

## End(Not run)
```

get_patients_by_modality

Get patient IDs given a collection name and modality

Description

Get patient IDs given a collection name and modality

Usage

```
get_patients_by_modality(collection, modality)
```

Arguments

`collection`	TCIA collection name. To get a list of available collection names, call `get_collection_names`.
`modality`	Modality name. To get a list of available modality names, call `get_modality_names` or see DICOM Modality Abbreviations.

Value

List containing elements:

- `patient_ids`: Patient IDs

- `content`: parsed API response content

- `response`: API response

See Also

`get_collection_names`, `get_modality_names`, DICOM Modality Abbreviations, TCIA REST API Usage Guide, TCIA API object definitions

Examples

```
## Not run:
get_patients_by_modality("TCGA-BRCA", "MR")

## End(Not run)
```

---

get_patient_info   *Get patient information*

Description

Get patient information

Usage

```
get_patient_info(collection = NULL)
```

Arguments

collection   TCIA collection name. If `collection` is `NULL`, patients from all collections will
                be returned. To get a list of available collection names, call [get_collection_names](#).

Value

List containing elements:

- `patients`: Data frame of patient ID, name, sex, ethnic group, and collection name

- `content`: parsed API response content

- `response`: API response

See Also

[get_collection_names](#), [TCIA REST API Usage Guide](#), [TCIA API object definitions](#)

Examples

```
## Not run:
get_patient_info()
get_patient_info("TCGA-BRCA")

## End(Not run)
```

---

get_patient_studies   *Get patient study information*

Description

Get patient study information

Usage

```
get_patient_studies(
  collection = NULL,
  patient_id = NULL,
  study_instance_uid = NULL
)
```

Arguments

collection   TCIA collection name. To get a list of available collection names, call get_collection_names.
                 If collection is NULL, information for all relevant collections will be returned.

patient_id   Patient ID. To get a list of available patient IDs, call get_patient_info. If
                 patient_id is NULL, information for all relevant patients will be returned.

study_instance_uid

                 Study instance UID. If study_instance_uid is NULL, information for all rele-
                 vant study instance UIDs will be returned. To get available study instance UIDs,
                 call get_studies_in_collection, get_patient_studies, or get_new_studies_in_collection.

Value

List containing elements:

- patient_studies: Data frame with columns representing the contents of a PatientStudy ob-
  ject as described in TCIA API Return Values
- content: parsed API response content
- response: API response

See Also

get_collection_names, get_patient_info, get_studies_in_collection, get_patient_studies,
get_new_studies_in_collection, TCIA REST API Usage Guide, TCIA API object definitions

Examples

```
## Not run:
get_patient_studies()
get_patient_studies(collection = "TCGA-BRCA")
get_patient_studies(patient_id = "TCGA-OL-A6VO")
get_patient_studies(patient_id = "TCGA-OL-A5DA",
```

```
    study_instance_uid = "1.3.6.1.4.1.14519.5.2.1.5382.4002.104582989590517557856962159716")

## End(Not run)
```

---

get_series_info   *Get image series information*

Description

Get image series information

Usage

```
get_series_info(
  collection = NULL,
  patient_id = NULL,
  study_instance_uid = NULL,
  series_instance_uid = NULL,
  modality = NULL,
  body_part_examined = NULL,
  manufacturer_model_name = NULL,
  manufacturer = NULL
)
```

Arguments

collection   TCIA collection name. To get a list of available collection names, call get_collection_names.
                    If collection is NULL, information for all relevant collections will be returned.

patient_id   Patient ID. To get a list of available patient IDs, call get_patient_info. If
                    patient_id is NULL, information for all relevant patients will be returned.

study_instance_uid
                    Study instance UID. If study_instance_uid is NULL, information for all rele-
                    vant study instance UIDs will be returned. To get available study instance UIDs,
                    call get_studies_in_collection, get_patient_studies, or get_new_studies_in_collection.

series_instance_uid
                    Series instance UID. To get a list of available series instance UIDs, call this func-
                    tion leaving out parameter series_instance_uid. If series_instance_uid
                    is NULL, information for all relevant series will be returned.

modality   Modality name. To get a list of available modality names, call get_modality_names
                    or see DICOM Modality Abbreviations. If modality is NULL, information for
                    all relevant modalities will be returned.

body_part_examined
                    Body part name. To get a list of available body part names, call get_body_part_names.
                    If body_part_examined is NULL, information for all relevant body parts will be
                    returned. IMPORTANT: a bug in this query key has been observed in the TCIA
                    API. If queries using this key return zero results, try removing this parameter.
```

manufacturer_model_name

> Manufacturer model name. To get a list of available model names, call this function leaving out parameter `manufacturer_model_name`. If `manufacturer_model_name` is NULL, information for all relevant model names will be returned.

manufacturer    Manufacturer name. To get a list of available manufacturer names, call `get_manufacturer_names`. If `manufacturer` is NULL, information for all relevant manufacturers will be returned.

## Value

List containing elements:

- `series`: Data frame with columns representing the contents of a Series object as described in TCIA API Return Values
- `content`: parsed API response content
- `response`: API response

## See Also

`get_collection_names`, `get_patient_info`, `get_studies_in_collection`, `get_patient_studies`, `get_new_studies_in_collection`, `get_modality_names`, `get_body_part_names`, `get_manufacturer_names`, TCIA REST API Usage Guide, TCIA API object definitions

## Examples

```
## Not run:
get_series_info()
get_series_info(collection = "TCGA-BRCA")
get_series_info(patient_id = "TCGA-OL-A6VO")
get_series_info(modality = "MR", manufacturer = "GE MEDICAL SYSTEMS")

## End(Not run)
```

---

get_series_size   *Get size of image series*

Description

Get size of image series

Usage

```
get_series_size(series_instance_uid)
```

Arguments

series_instance_uid

> Series instance UID. To get a list of available series instance UIDs, call `get_series_info`.

Value

List containing elements:

- `size_bytes`: Total size of image series in bytes
- `object_count`: Number of objects in image series
- `content`: parsed API response content
- `response`: API response

See Also

[`get_series_info`](#), [TCIA REST API Usage Guide](#), [TCIA API object definitions](#)

Examples

```
## Not run:
get_series_size("1.3.6.1.4.1.14519.5.2.1.5382.4002.272234209223992578700978260744")

## End(Not run)
```

---

get_sop_instance_uids *Get SOP instance UIDs (individual DICOM image IDs) for an image series*

Description

Get SOP instance UIDs (individual DICOM image IDs) for an image series

Usage

```
get_sop_instance_uids(series_instance_uid)
```

Arguments

`series_instance_uid`

Series instance UID. To get a list of available series instance UIDs, call [`get_series_info`](#).

Value

List containing elements:

- `sop_instance_uids`: character vector of SOP instance UIDs (individual DICOM image IDs)
- `content`: parsed API response content
- `response`: API response

See Also

[`get_series_info`](#), [TCIA REST API Usage Guide](#), [TCIA API object definitions](#)

Examples

```
## Not run:
get_sop_instance_uids("1.3.6.1.4.1.14519.5.2.1.5382.4002.272234209223992578700978260744")

## End(Not run)
```

---

get_studies_in_collection

Get studies in a collection and optionally for a specific patient

---

Description

Get studies in a collection and optionally for a specific patient

Usage

```
get_studies_in_collection(collection, patient_id = NULL)
```

Arguments

collection	TCIA collection name. To get a list of available collection names, call get_collection_names.
patient_id	Patient ID. To get a list of available patient IDs, call get_patient_info. If patient_id is NULL, studies for all patients in the collection will be returned.

Value

List containing elements:

- studies: Data frame of collection, patient ID, and study instance UID
- content: parsed API response content
- response: API response

See Also

get_collection_names, get_patient_info, TCIA REST API Usage Guide, TCIA API object
definitions

Examples

```
## Not run:
get_studies_in_collection("TCGA-BRCA")
get_studies_in_collection("TCGA-BRCA", "TCGA-OL-A66O")

## End(Not run)
```

---

read_tcia   *Read TCIA file*

Description

Read TCIA file

Usage

```
read_tcia(file)
```

Arguments

file   path to file from TCIA, usually with extension tcia

Value

A list of values

Examples

```
file = system.file("doiJNLP-T5OW0OWM.tcia", package = "TCIApathfinder")
res = read_tcia(file)
testthat::expect_equal(res$noOfrRetry, "4")
testthat::expect_equal(length(res$ListOfSeriesToDownload), 82L)
```

---

save_extracted_image_series
                    Save a series of DICOM image files to a directory

---

Description

Save a series of DICOM image files to a directory

Usage

```
save_extracted_image_series(
  series_instance_uid,
  out_dir = NULL,
  verbose = TRUE
)

extract_image_series(zip_file, out_dir = NULL)
```

Arguments

series_instance_uid

        Series instance UID. To get a list of available series instance UIDs, call [get_series_info](#).
        Note: if series_instance_uid is invalid, the API may still successfully return
        an empty zip file.

out_dir   Directory to write zip file to

verbose   print diagnostic messages

zip_file   downloaded zip file, usually output of [save_image_series](#)

Value

List containing elements:

- files: The output zip file that was written
- dirs: Directories of the files
- out_file: The output zip file that was written
- response: API response

Examples

```
## Not run:
save_extracted_image_series(
    series_instance_uid = "1.3.6.1.4.1.14519.5.2.1.5382.4002.806935685832642465081499816867")

## End(Not run)
```

---

save_image_series   *Save a series of DICOM image files as a zip file*

Description

Save a series of DICOM image files as a zip file

Usage

```
save_image_series(series_instance_uid, out_dir = NULL, out_file_name = NULL)
```

Arguments

series_instance_uid

        Series instance UID. To get a list of available series instance UIDs, call [get_series_info](#).
        Note: if series_instance_uid is invalid, the API may still successfully return
        an empty zip file.

out_dir   Directory to write zip file to

out_file_name   Name of zip file to write. If out_file_name is NULL, the original file name will
        be used.

Value

List containing elements:

- out_file: The output zip file that was written
- response: API response

See Also

[get_series_info](#), [TCIA REST API Usage Guide](#), [TCIA API object definitions](#)

Examples

```
## Not run:
save_image_series(
   series_instance_uid = "1.3.6.1.4.1.14519.5.2.1.5382.4002.806935685832642465081499816867",
    out_dir = "~/Desktop")
save_image_series(
   series_instance_uid = "1.3.6.1.4.1.14519.5.2.1.5382.4002.806935685832642465081499816867",
    out_dir = "~/Desktop", out_file_name = "file.zip")

## End(Not run)
```

---

save_single_image   *Save a single DICOM image file*

Description

Save a single DICOM image file

Usage

```
save_single_image(
  series_instance_uid,
  sop_instance_uid,
  out_dir = NULL,
  out_file_name = NULL
)
```

Arguments

series_instance_uid

    Series instance UID. To get a list of available series instance UIDs, call [get_series_info](#).

sop_instance_uid

    SOP instance UID. To get a list of SOP instance UIDs for an image series, call [get_sop_instance_uids](#).

out_dir   Directory to write DICOM file to

out_file_name   Name of DICOM file to write, with .dcm extension. If out_file_name is NULL, the original file name will be used.

Value

List containing elements:

- `out_file`: The output file that was written
- `response`: API response

See Also

`get_series_info`, `get_sop_instance_uids`, TCIA REST API Usage Guide, TCIA API object definitions

Examples

```
## Not run:
save_single_image(
    series_instance_uid = "1.3.6.1.4.1.14519.5.2.1.5382.4002.806935685832642465081499816867",
    sop_instance_uid = "1.3.6.1.4.1.14519.5.2.1.5382.4002.257663256941568276393774062283")
save_single_image(
    series_instance_uid = "1.3.6.1.4.1.14519.5.2.1.5382.4002.806935685832642465081499816867",
    sop_instance_uid = "1.3.6.1.4.1.14519.5.2.1.5382.4002.257663256941568276393774062283",
      out_file_name = "file.dcm")

## End(Not run)
```

Index