

Package ‘alabaster.spatial’

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Title Save and Load Spatial 'Omics Data to/from File

Description Save SpatialExperiment objects and their images into file artifacts, and load them back into memory.

This is a more portable alternative to serialization of such objects into RDS files. Each artifact is associated with metadata for further interpretation; downstream applications can enrich this metadata with context-specific properties.

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Depends SpatialExperiment, alabaster.base

Imports methods, utils, grDevices, S4Vectors, SummarizedExperiment, jsonlite, alabaster.sce

Suggests testthat, knitr, rmarkdown, BiocStyle, DropletUtils, magick, png, digest

VignetteBuilder knitr

RoxygenNote 7.2.1

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loadSpatialExperiment *Load a spatial experiment*

Description

Load a [SpatialExperiment](#) object from its constituent files in DataSetDB.

Usage

```
loadSpatialExperiment(exp.info, project)
```

Arguments

| | |
|----------|--|
| exp.info | Named list of metadata for a spatial 'omics experiment. |
| project | Any argument accepted by the acquisition functions, see ?acquireFile . By default, this should be a string containing the path to a staging directory. |

Value

A [SpatialExperiment](#) object.

Author(s)

Aaron Lun

Examples

```
library(SpatialExperiment)
example(read10xVisium, echo=FALSE)
colnames(spe) <- make.unique(colnames(spe)) # forcing unique column names.

tmp <- tempfile()
dir.create(tmp)
meta <- stageObject(spe, tmp, "experiment-1")

meta$path <- "experiment-1/experiment.json"
loadSpatialExperiment(meta, tmp)
```

| | |
|------------------|-----------------------------|
| loadSpatialImage | <i>Load a spatial image</i> |
|------------------|-----------------------------|

Description

Load an image as a [SpatialImage](#) or subclass thereof.

Usage

```
loadSpatialImage(img.info, project)
```

Arguments

| | |
|----------|--|
| img.info | Named list containing the metadata for this assay. |
| project | Any argument accepted by the acquisition functions, see ?acquireFile . By default, this should be a string containing the path to a staging directory. |

Value

A [SpatialImage](#) containing the image data (or a reference to it).

Author(s)

Aaron Lun

Examples

```
example(read10xVisium, echo=FALSE)
img <- imgData(spe)$data[[1]]

tmp <- tempfile()
dir.create(tmp)
meta <- stageObject(img, tmp, "whee")

out <- loadSpatialImage(meta, tmp)
```

| |
|---------------------------------------|
| stageObject, SpatialExperiment-method |
| <i>Stage a spatial experiment</i> |

Description

Stage a [SpatialExperiment](#) object.

Usage

```
## S4 method for signature 'SpatialExperiment'  
stageObject(x, dir, path, child = FALSE, ...)
```

Arguments

| | |
|-------|--|
| x | A SpatialExperiment object. |
| dir | String containing the path to the staging directory. |
| path | String containing a prefix of the relative path inside dir where x is to be saved. The actual path used to save x may include additional components, see Details . |
| child | Logical scalar indicating whether x is a child of a larger object. |
| ... | Further arguments to pass to specific methods. |

Value

A named list of the same form as that returned by the [stageObject](#) method for a [SingleCellExperiment](#), but containing additional fields for the spatial data. A directory is created at path inside dir and is populated with the contents of x.

Author(s)

Aaron Lun

Examples

```
library(SpatialExperiment)  
example(read10xVisium, echo=FALSE)  
colnames(spe) <- make.unique(colnames(spe)) # forcing unique column names.  
  
tmp <- tempfile()  
dir.create(tmp)  
stageObject(spe, tmp, "experiment-1")  
list.files(tmp, recursive=TRUE)
```

stageSpatialImage

Stage images for upload to DataSetDB

Description

Stage images from a variety of sources in preparation for upload to DataSetDB.

Usage

```
## S4 method for signature 'VirtualSpatialImage'  
stageObject(x, dir, path, child = FALSE, ...)  
  
## S4 method for signature 'StoredSpatialImage'  
stageObject(x, dir, path, child = FALSE, ...)  
  
## S4 method for signature 'RemoteSpatialImage'  
stageObject(x, dir, path, child = FALSE, ...)
```

Arguments

| | |
|-------|--|
| x | A SpatialImage object. |
| dir | String containing the path to the staging directory. |
| path | String containing a prefix of the relative path inside dir where x is to be saved. The actual path used to save x may include additional components, see Details . |
| child | Logical scalar indicating whether x is a child of a larger object. |
| ... | Further arguments to pass to specific methods. |

Details

Each of the different methods will take advantage of any existing files to avoid an actual save. For example, the [RemoteSpatialImage](#) method will download the file directly to path, while the [StoredSpatialImage](#) method will create a link or copy the file. The [SpatialImage](#) method will fall back to saving the raster directly as a PNG.

Value

An image file is created at `file.path(dir, path)`, possibly after appending an appropriate file extension.

The return value should be a named list containing at least:

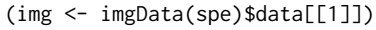
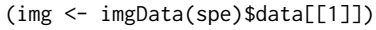
- `$schema`, a string specifying the schema to use to validate the metadata. This may have a `package` attribute to specify the package where the schema lives (in its `inst/schemas` directory).
- `path`, a string containing the path to the file containing the assay contents. This should start with the input path but can be followed by any necessary file extensions.
- `child`, whether this is a child resource of a larger object.

Other fields can be provided and will be included in the metadata, provided that they are recognized by the specified schema.

Author(s)

Aaron Lun

Examples

```
example(read10xVisium, echo=FALSE)



# Doing a local run:
tmp <- tempfile()
dir.create(tmp)
stageObject(img, tmp, "whee")

# Forcing a re-save:
Y <- as(img, "LoadedSpatialImage")
stageObject(Y, tmp, "foo")
```

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