

# Package ‘alabaster.se’

September 29, 2023

**Title** Load and Save SummarizedExperiments from File

**Version** 1.0.0

**Date** 2023-02-20

**License** MIT + file LICENSE

**Description** Save SummarizedExperiments 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.

**Depends** SummarizedExperiment, alabaster.base

**Imports** methods, alabaster.ranges, alabaster.matrix, BiocGenerics,  
S4Vectors, IRanges, GenomicRanges

**Suggests** rmarkdown, knitr, testthat, BiocStyle, jsonlite

**VignetteBuilder** knitr

**RoxygenNote** 7.2.3

**biocViews** DataImport, DataRepresentation

**git\_url** <https://git.bioconductor.org/packages/alabaster.se>

**git\_branch** RELEASE\_3\_17

**git\_last\_commit** e7fc40c

**git\_last\_commit\_date** 2023-04-25

**Date/Publication** 2023-09-29

**Author** Aaron Lun [aut, cre]

**Maintainer** Aaron Lun <[infinite.monkeys.with.keyboards@gmail.com](mailto:infinite.monkeys.with.keyboards@gmail.com)>

## R topics documented:

emptyRowRanges . . . . .	2
loadSummarizedExperiment . . . . .	2
stageObject,SummarizedExperiment-method . . . . .	3

<b>Index</b>	<b>6</b>
--------------	----------

---

emptyRowRanges	<i>Is the rowRanges empty?</i>
----------------	--------------------------------

---

**Description**

Check the `rowRanges` of a `RangedSummarizedExperiment` is empty, i.e., a `GRangesList` with no ranges.

**Usage**

```
emptyRowRanges(x)
```

**Arguments**

`x` A `RangedSummarizedExperiment` object or the contents of its `rowRanges`.

**Details**

Metadata in `mcols` is ignored for the purpose of this discussion, as this can be moved to the `rowData(x)` of the base `SummarizedExperiment` class without loss. In other words, non-empty `mcols` will not be used to determine that the `rowRanges` is not empty. However, non-empty fields in the `metadata` or in the inner `mcols` of the `GRanges` will trigger a non-emptiness decision.

**Value**

A logical scalar indicating whether `x` has empty `rowRanges`.

**Examples**

```
emptyRowRanges(SummarizedExperiment())
emptyRowRanges(SummarizedExperiment(rowRanges=GRanges()))
emptyRowRanges(SummarizedExperiment(rowRanges=GRangesList()))
```

---

```
loadSummarizedExperiment
```

*Load a SummarizedExperiment*

---

**Description**

Default loading of `SummarizedExperiments` based on the metadata stored by the corresponding `stageObject` method.

**Usage**

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

**Arguments**

exp.info            Named list containing the metadata for this 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 [SummarizedExperiment](#) or [RangedSummarizedExperiment](#) object.

**Author(s)**

Aaron Lun

**Examples**

```
# Mocking up an experiment:
mat <- matrix(rpois(10000, 10), ncol=10)
colnames(mat) <- letters[1:10]
rownames(mat) <- sprintf("GENE_%i", seq_len(nrow(mat)))

se <- SummarizedExperiment(list(counts=mat))
se$stuff <- LETTERS[1:10]
rowData(se)$blah <- runif(1000)
metadata(se)$whee <- "YAY"

# Staging it:
tmp <- tempfile()
dir.create(tmp)
info <- stageObject(se, dir=tmp, "rna-seq")

# And loading it back in:
loadSummarizedExperiment(info, tmp)
```

---

stageObject, SummarizedExperiment-method

*Stage a SummarizedExperiment*

---

**Description**

Save a [SummarizedExperiment](#) to file inside the staging directory.

**Usage**

```
## S4 method for signature 'SummarizedExperiment'
stageObject(x, dir, path, child = FALSE, meta.name = "experiment.json", ...)

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

**Arguments**

x	A <a href="#">SummarizedExperiment</a> object or one of its subclasses.
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.
meta.name	String containing the name of the metadata file.
...	Further arguments to pass to the <a href="#">SummarizedExperiment</a> method. For the SummarizedExperiment itself, all further arguments are just ignored.
skip.ranges	Logical scalar indicating whether to avoid saving the <a href="#">rowRanges</a> .

**Details**

meta.name is only needed to set up the output path, for consistency with the [stageObject](#) contract. Callers should make sure to write the metadata to the same path by using [.writeMetadata](#) to create the JSON file.

If skip.ranges=TRUE, the RangedSummarizedExperiment method just calls the SummarizedExperiment method, i.e., [rowRanges](#) are not saved. This avoids the hassle of switching classes and the associated problems, e.g., <https://github.com/Bioconductor/SummarizedExperiment/issues/29>. Note that any subsequent [loadObject](#) call on the staged assets will return a non-ranged SummarizedExperiment.

If x is a RangedSummarizedExperiment with “empty” [rowRanges](#) (i.e., a [GRangesList](#) with zero-length entries), stageObject will save it to file without any genomic range information. This means that any subsequent [loadObject](#) on the staged assets will return a non-ranged SummarizedExperiment.

By default, we consider the presence of data frames in the assays to be an error. Users should coerce these into an appropriate matrix type, e.g., a dense matrix or a sparse dgCMatrx. If a DataFrame as an assay is truly desired, users may set `options(alabaster.se.reject_data.frames=FALSE)` to skip the error. Note that this only works for [DataFrame](#) objects - data.frame objects will not be saved correctly.

**Value**

A named list of metadata that follows the summarized\_experiment schema. The contents of x are saved into a path subdirectory inside dir.

**Author(s)**

Aaron Lun

**Examples**

```
tmp <- tempfile()
dir.create(tmp)

mat <- matrix(rpois(10000, 10), ncol=10)
```

```
colnames(mat) <- letters[1:10]
rownames(mat) <- sprintf("GENE_%i", seq_len(nrow(mat)))

se <- SummarizedExperiment(list(counts=mat))
se$stuff <- LETTERS[1:10]
rowData(se)$blah <- runif(1000)
metadata(se)$whee <- "YAY"

dir.create(tmp)
stageObject(se, dir=tmp, "rna-seq")
list.files(file.path(tmp, "rna-seq"))
```

# Index

[.writeMetadata](#), [4](#)  
[acquireFile](#), [3](#)  
[DataFrame](#), [4](#)  
[emptyRowRanges](#), [2](#)  
[GRanges](#), [2](#)  
[GRangesList](#), [2, 4](#)  
[loadObject](#), [4](#)  
[loadSummarizedExperiment](#), [2](#)  
[mcols](#), [2](#)  
[metadata](#), [2](#)  
[options](#), [4](#)  
[RangedSummarizedExperiment](#), [2, 3](#)  
[rowData](#), [2](#)  
[rowRanges](#), [2, 4](#)  
[stageObject](#), [2, 4](#)  
[stageObject](#), [RangedSummarizedExperiment-method](#)  
    ([stageObject](#), [SummarizedExperiment-method](#)),  
    [3](#)  
[stageObject](#), [SummarizedExperiment-method](#),  
    [3](#)  
[SummarizedExperiment](#), [2–4](#)