

# Package ‘alabaster.se’

September 17, 2025

**Title** Load and Save SummarizedExperiments from File

**Version** 1.8.0

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**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, jsonlite

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

**VignetteBuilder** knitr

**RoxygenNote** 7.3.1

**biocViews** DataImport, DataRepresentation

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|                |                                |
|----------------|--------------------------------|
| 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()))
```

---

|                                |                                                    |
|--------------------------------|----------------------------------------------------|
| readRangedSummarizedExperiment | <i>Read a RangedSummarizedExperiment from disk</i> |
|--------------------------------|----------------------------------------------------|

---

**Description**

Read a `RangedSummarizedExperiment` from its on-disk representation. This is usually not directly called by users, but is instead called by dispatch in `readObject`.

**Usage**

```
readRangedSummarizedExperiment(path, metadata, ...)
```

**Arguments**

|          |                                                                                                                                                             |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| path     | String containing a path to a directory, itself created using the <a href="#">saveObject</a> method for <a href="#">RangedSummarizedExperiment</a> objects. |
| metadata | Named list of metadata for this object, see <a href="#">readObjectFile</a> for details.                                                                     |
| ...      | Further arguments passed to <a href="#">readSummarizedExperiment</a> and internal <a href="#">altReadObject</a> calls.                                      |

**Value**

A [RangedSummarizedExperiment](#) object.

**Author(s)**

Aaron Lun

**See Also**

["saveObject,RangedSummarizedExperiment-method"](#), to save the [RangedSummarizedExperiment](#) to disk.

**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)))

gr <- GRanges("chrA", IRanges(1:1000, width=10))
se <- SummarizedExperiment(list(counts=mat), rowRanges=gr)
se$stuff <- LETTERS[1:10]
rowData(se)$blah <- runif(1000)
metadata(se)$whee <- "YAY"

tmp <- tempfile()
saveObject(se, tmp)
readObject(tmp)
```

---

readSummarizedExperiment

*Read a SummarizedExperiment from disk*

---

**Description**

Read a [SummarizedExperiment](#) from its on-disk representation. This is usually not directly called by users, but is instead called by dispatch in [readObject](#).

**Usage**

```
readSummarizedExperiment(path, metadata, ...)
```

**Arguments**

|          |                                                                                                                                                       |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| path     | String containing a path to a directory, itself created using the <a href="#">saveObject</a> method for <a href="#">SummarizedExperiment</a> objects. |
| metadata | Named list of metadata for this object, see <a href="#">readObjectFile</a> for details.                                                               |
| ...      | Further arguments passed to internal <a href="#">altReadObject</a> calls.                                                                             |

**Value**

A [SummarizedExperiment](#) object.

**Author(s)**

Aaron Lun

**See Also**

["saveObject, SummarizedExperiment-method"](#), to save the SummarizedExperiment to disk.

**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"

tmp <- tempfile()
saveObject(se, tmp)
readObject(tmp)
```

---

```
saveRangedSummarizedExperiment
```

*Save a RangedSummarizedExperiment to disk*

---

**Description**

Save a [RangedSummarizedExperiment](#) to its on-disk representation.

**Usage**

```
## S4 method for signature 'RangedSummarizedExperiment'  
saveObject(x, path, ...)
```

**Arguments**

|      |                                                                                                                                            |
|------|--------------------------------------------------------------------------------------------------------------------------------------------|
| x    | A <a href="#">RangedSummarizedExperiment</a> object or one of its subclasses.                                                              |
| path | String containing the path to a directory in which to save x.                                                                              |
| ...  | Further arguments to pass to " <a href="#">saveObject, SummarizedExperiment-method</a> " and internal <a href="#">altSaveObject</a> calls. |

**Value**

x is saved into path and NULL is invisibly returned.

**Author(s)**

Aaron Lun

**See Also**

[readRangedSummarizedExperiment](#), to read the RangedSummarizedExperiment back into the R session.

**Examples**

```
mat <- matrix(rpois(10000, 10), ncol=10)  
colnames(mat) <- letters[1:10]  
rownames(mat) <- sprintf("GENE_%i", seq_len(nrow(mat)))  
  
gr <- GRanges("chrA", IRanges(1:1000, width=10))  
se <- SummarizedExperiment(list(counts=mat), rowRanges=gr)  
se$stuff <- LETTERS[1:10]  
rowData(se)$blah <- runif(1000)  
metadata(se)$whee <- "YAY"  
  
tmp <- tempfile()  
saveObject(se, tmp)  
list.files(tmp, recursive=TRUE)
```

saveSummarizedExperiment

*Save a SummarizedExperiment to disk*

---

## Description

Save a [SummarizedExperiment](#) to its on-disk representation.

## Usage

```
## S4 method for signature 'SummarizedExperiment'
saveObject(x, path, SummarizedExperiment.allow.dataframe.assay = FALSE, ...)
```

## Arguments

|                                            |                                                                            |
|--------------------------------------------|----------------------------------------------------------------------------|
| x                                          | A <a href="#">SummarizedExperiment</a> object or one of its subclasses.    |
| path                                       | String containing the path to a directory in which to save x.              |
| SummarizedExperiment.allow.dataframe.assay | Logical scalar indicating whether to allow data frames as assays of x.     |
| ...                                        | Further arguments to pass to internal <a href="#">altSaveObject</a> calls. |

## Details

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 dgCMatrix. 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

x is saved into path and NULL is invisibly returned.

## Author(s)

Aaron Lun

## See Also

[readSummarizedExperiment](#), to read the SummarizedExperiment back into the R session.

**Examples**

```
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"

tmp <- tempfile()
saveObject(se, tmp)
list.files(tmp, recursive=TRUE)
```

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