

# Package ‘alevinQC’

October 16, 2020

**Type** Package

**Title** Generate QC Reports For Alevin Output

**Version** 1.4.0

**Description** Generate QC reports summarizing the output from an alevin run.  
Reports can be generated as html or pdf files, or as shiny applications.

**Encoding** UTF-8

**Depends** R (>= 3.6)

**Imports** rmarkdown, tools, methods, ggplot2, GGally, dplyr, rjson,  
shiny, shinydashboard, DT, stats, utils, tximport (>= 1.11.5),  
cowplot, rlang

**RoxygenNote** 7.1.0

**Suggests** knitr, BiocStyle, testthat

**VignetteBuilder** knitr

**biocViews** QualityControl, SingleCell

**URL** <https://github.com/csoneson/alevinQC>

**BugReports** <https://github.com/csoneson/alevinQC/issues>

**License** MIT + file LICENSE

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

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## R topics documented:

alevinQC-pkg . . . . .	2
alevinQCReport . . . . .	2
alevinQCShiny . . . . .	4
checkAlevinInputFiles . . . . .	4

plotAlevinBarcodeCollapse . . . . .	5
plotAlevinKneeNbrGenes . . . . .	6
plotAlevinKneeRaw . . . . .	6
plotAlevinQuant . . . . .	7
plotAlevinQuantPairs . . . . .	8
readAlevinQC . . . . .	9

## Index 10

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alevinQC-pkg	<i>alevinQC</i>
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### Description

alevinQC

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alevinQCReport	<i>Generate alevin summary report</i>
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### Description

Generate a report summarizing the main aspects of an alevin quantification run. The report generation assumes that alevin has been run with the `-dumpFeatures` flag to generate the necessary output files.

### Usage

```
alevinQCReport(
  baseDir,
  sampleId,
  outputFile,
  outputDir = "./",
  outputFormat = NULL,
  showCode = FALSE,
  forceOverwrite = FALSE,
  knitrProgress = FALSE,
  quiet = FALSE,
  ignorePandoc = FALSE,
  customCBList = list(),
  ...
)
```

### Arguments

<code>baseDir</code>	Path to the output directory from the alevin run (should be the directory containing the alevin directory).
<code>sampleId</code>	Sample ID, will be used to set the title for the report.
<code>outputFile</code>	File name of the output report. The file name extension must be either <code>.html</code> or <code>.pdf</code> , and consistent with the value of <code>outputFormat</code> .

<code>outputDir</code>	Path to the output directory where the report will be generated.
<code>outputFormat</code>	The format of the output report. Either <code>"html_document"</code> or <code>"pdf_document"</code> . The file name extension of <code>outputFile</code> must be consistent with this choice.
<code>showCode</code>	Logical, whether to display the R code in the report.
<code>forceOverwrite</code>	Logical, whether to force overwrite an existing report with the same name in the output directory.
<code>knitrProgress</code>	Logical, whether to display the progress of <code>knitr</code> when generating the report.
<code>quiet</code>	Logical, whether to show progress messages.
<code>ignorePandoc</code>	Logical, determines what to do if <code>pandoc</code> or <code>pandoc-citeproc</code> is missing (if <code>Sys.which("pandoc")</code> or <code>Sys.which("pandoc-citeproc")</code> returns <code>""</code> ). If <code>ignorePandoc</code> is <code>TRUE</code> , only a warning is given. The figures will be generated, but not the final report. If <code>ignorePandoc</code> is <code>FALSE</code> (default), the execution stops immediately.
<code>customCBList</code>	Named list with custom set(s) of barcodes to provide summary statistics/plots for, in addition to the whitelists generated by <code>alevin</code> .
<code>...</code>	Other arguments that will be passed to <code>rmarkdown::render</code> .

## Details

When the function is called, a `.Rmd` template file will be copied into the output directory, and `rmarkdown::render` will be called to generate the final report. If there is already a `.Rmd` file with the same name in the output directory, the function will raise an error and stop, to avoid overwriting the existing file. The reason for this behaviour is that the copied template in the output directory will be deleted once the report is generated.

## Value

Generates a summary report in the `outputDir` directory, and returns (invisibly) the name of the generated report.

## Author(s)

Charlotte Soneson

## Examples

```
alevinQCReport(baseDir = system.file("extdata/alevin_example_v0.14",
                                     package = "alevinQC"),
               sampleId = "example", outputFile = "alevinReport.html",
               outputDir = tempdir(), forceOverwrite = TRUE)
```

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alevinQCShiny	<i>Generate alevin summary shiny app</i>
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**Description**

Generate a shiny app summarizing the main aspects of an alevin quantification run. The app generation assumes that alevin has been run with the `-dumpFeatures` flag to generate the necessary output files.

**Usage**

```
alevinQCShiny(baseDir, sampleId, customCBLIST = list())
```

**Arguments**

<code>baseDir</code>	Path to the output directory from the alevin run (should be the directory containing the alevin directory).
<code>sampleId</code>	Sample ID, will be used set the title for the app.
<code>customCBLIST</code>	Named list with custom set(s) of barcodes to provide summary statistics/plots for, in addition to the whitelists generated by alevin.

**Value**

A shiny app.

**Author(s)**

Charlotte Soneson

**Examples**

```
app <- alevinQCShiny(baseDir = system.file("extdata/alevin_example_v0.14",
                                           package = "alevinQC"),
                    sampleId = "example")
if (interactive()) {
  shiny::runApp(app)
}
```

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checkAlevinInputFiles	<i>Check that all required input files are available</i>
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**Description**

Check that all required input files are available

**Usage**

```
checkAlevinInputFiles(baseDir)
```

**Arguments**

`baseDir` Path to the output directory from the alevin run (should be the directory containing the alevin directory).

**Value**

Returns nothing, raises an error if any of the required files are missing.

**Author(s)**

Charlotte Soneson

**Examples**

```
checkAlevinInputFiles(system.file("extdata/alevin_example_v0.14",
                                   package = "alevinQC"))
```

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`plotAlevinBarcodeCollapse`

*Summary plot of cell barcode collapsing*

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**Description**

Plot the original frequency of each cell barcode in the original whitelist against the frequency after collapsing similar cell barcodes.

**Usage**

```
plotAlevinBarcodeCollapse(cbTable)
```

**Arguments**

`cbTable` `data.frame` (such as the `cbTable` returned by `readAlevinQC`) with barcode frequencies before and after collapsing.

**Value**

A `ggplot` object

**Author(s)**

Charlotte Soneson

**Examples**

```
alevin <- readAlevinQC(system.file("extdata/alevin_example_pre0.14",
                                   package = "alevinQC"))
plotAlevinBarcodeCollapse(alevin$cbTable)
```

plotAlevinKneeNbrGenes

*Knee plot of the number of detected genes per cell*

---

### Description

Plot the number of detected genes per cell in decreasing order. Only cells contained in the original whitelist are considered.

### Usage

```
plotAlevinKneeNbrGenes(cbTable)
```

### Arguments

cbTable            data.frame (such as the cbTable returned by readAlevinQC) with the number of detected genes per cell.

### Value

A ggplot object

### Author(s)

Charlotte Soneson

### Examples

```
alevin <- readAlevinQC(system.file("extdata/alevin_example_pre0.14",  
                                package = "alevinQC"))  
plotAlevinKneeNbrGenes(alevin$cbTable)
```

---

plotAlevinKneeRaw

*Knee plot of raw cell barcode frequencies*

---

### Description

Plot the raw cell barcode frequencies in decreasing order, and indicate a predetermined breakpoint (indicating barcodes included in the original whitelist) using color as well as a label.

### Usage

```
plotAlevinKneeRaw(cbTable)
```

### Arguments

cbTable            data.frame with raw barcode frequencies (such as the cbTable returned by readAlevinQC).

**Value**

A ggplot object

**Author(s)**

Charlotte Soneson

**Examples**

```
alevin <- readAlevinQC(system.file("extdata/alevin_example_pre0.14",  
                                package = "alevinQC"))  
plotAlevinKneeRaw(alevin$cbTable)
```

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plotAlevinQuant

*Panel of plots with quantification summary statistics*

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**Description**

Panel of plots with quantification summary statistics

**Usage**

```
plotAlevinQuant(  
  cbTable,  
  colName = "inFinalWhiteList",  
  cbName = "final whitelist"  
)
```

**Arguments**

cbTable	data.frame (such as the cbTable returned by readAlevinQC) with collapsed barcode frequencies, the total UMI count and the number of detected genes for each cell.
colName	Character scalar giving the name of a logical column of cbTable to use for coloring the points.
cbName	Character scalar giving the name of the set of barcodes defined by colName, used for labelling the plot legend.

**Value**

A ggplot object

**Author(s)**

Charlotte Soneson

**Examples**

```
alevin <- readAlevinQC(system.file("extdata/alevin_example_v0.14",
                                package = "alevinQC"))
plotAlevinQuant(alevin$cbTable, colName = "inFinalWhiteList",
               cbName = "final whitelist")
```

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plotAlevinQuantPairs *Pairs plot with quantification summary statistics*

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**Description**

Pairs plot with quantification summary statistics

**Usage**

```
plotAlevinQuantPairs(cbTable, colName = "inFinalWhiteList")
```

**Arguments**

cbTable	data.frame (such as the cbTable returned by readAlevinQC) with collapsed barcode frequencies, the total UMI count and the number of detected genes for each cell.
colName	Character scalar giving the name of a logical column of cbTable to use for coloring the points.

**Value**

A ggmatrix object

**Author(s)**

Charlotte Sonesson

**Examples**

```
alevin <- readAlevinQC(system.file("extdata/alevin_example_pre0.14",
                                package = "alevinQC"))
plotAlevinQuantPairs(alevin$cbTable, colName = "inFinalWhiteList")
```



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readAlevinQC	<i>Read alevin data required to generate summary report</i>
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**Description**

Read all alevin output files required to generate the summary report or shiny app.

**Usage**

```
readAlevinQC(baseDir, customCBList = list())
```

**Arguments**

baseDir	Path to the output directory from the alevin run (should be the directory containing the alevin directory).
customCBList	Named list with custom set(s) of barcodes to provide summary statistics/plots for, in addition to the whitelists generated by alevin.

**Value**

A list collecting all necessary information for generating the summary report/shiny app.

**Author(s)**

Charlotte Soneson

**Examples**

```
alevin <- readAlevinQC(system.file("extdata/alevin_example_v0.14",  
                                package = "alevinQC"))
```

# Index

[alevinQC-pkg](#), 2  
[alevinQCReport](#), 2  
[alevinQCShiny](#), 4

[checkAlevinInputFiles](#), 4

[plotAlevinBarcodeCollapse](#), 5  
[plotAlevinKneeNbrGenes](#), 6  
[plotAlevinKneeRaw](#), 6  
[plotAlevinQuant](#), 7  
[plotAlevinQuantPairs](#), 8

[readAlevinQC](#), 9