Package 'TockyLocus'

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Title Quantitative Method for Fluorescent Timer Reporters

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Description This package provides quantitative analysis methods forFluorescent Timer data obtained by flow cytometry. Specifically it provides the quantitative analysis methods for trigonometric transformed data, Timer Angle.

Depends R (>= 4.2.0), utils, stats, graphics, grDevices, methods

Imports TockyPrep, ggplot2, ggridges, viridis, RColorBrewer, rlang

Suggests knitr, rmarkdown, KernSmooth

VignetteBuilder knitr

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URL https://github.com/MonoTockyLab/TockyLocus, https://MonoTockyLab.github.io/TockyLocus

BugReports https://github.com/MonoTockyLab/TockyLocus/issues

Encoding UTF-8

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Contents

GetStatsTockyLocus *Perform Statistical Tests for Tocky Locus Analysis*

Description

This function performs statistical tests on Tocky Locus data, allowing for different methods and p-value adjustments.

Usage

```
GetStatsTockyLocus(
  x,
  percentTimer = FALSE,
  p_adjust_method = "BH",
  method = "ASR",
  verbose = TRUE
)
```

Arguments

x	A TockyPrepData object containing Tocky Locus data.
percentTimer	Logical. If TRUE, the percentages of Timer-positive cells will be used; if FALSE, percentages of parent cells will be used.
p_adjust_method	Character string specifying the method for p-value adjustment in multiple testing. Default is 'BH' (Benjamini-Hochberg). Other methods available in p.adjust, such as 'holm' or 'bonferroni', can also be used.
method	Character string specifying the statistical test method to use. Options are: 'Wilcox' Mann-Whitney U test (Wilcoxon rank sum test) without data transformation. 'ASR' Arcsine Square Root Transformation, followed by a normality test and t-test. 'Logit' Logit Transformation, followed by a normality test and t-test.
verbose	Logical indicating whether to print progress messages and outputs. Default is TRUE.

Value

A TockyPrepData object containing the statistical outputs for Tocky Locus Analysis, stored in x@Tocky$TockyLocusStats.

Examples

```
## Not run:
x <- GetStatsTockyLocus(x, method = 'ASR')

## End(Not run)
```

Locus_to_colour *Convert Timer Angle Data into color code*

Description

This function assigns colors to different ranges of angle values, with an option to use colorblind-friendly colors from the viridis palette.

Usage

```
Locus_to_colour(x, viridis = FALSE)
```

Arguments

x	Angle numeric vector.
viridis	Logical, whether to use the viridis color palette.

Value

a character vector for color code.

Examples

```
## Not run:
col <- Locus_to_colour(x = c(0, 25, 45, 65, 90), viridis = TRUE)

## End(Not run)
```

plotAngleDensity *Plot Density of Angles by Group Using Ridge Plots*

Description

This function takes a TockyPrepData object, which should have been previously processed using the `timer_transform` function, and creates a ridge plot showing the density distribution of angles for each group defined in the dataset.

Usage

```
plotAngleDensity(x, alpha = 0.3, group_order = NULL, scale = 2, legend = FALSE)
```

Arguments

x	A TockyPrepData object that has been processed with the `timer_transform` function.
alpha	A number between 0 and 1 to be usedby ggridges.
group_order	Optional. A character vector to define the order of group
scale	A scaling factor to scale the height of the ridgelines. Used by ggridges.
legend	Logical. If TRUE, legend is included.

Value

A ggplot object showing the density distribution of angles by group.

Examples

```
## Not run:
plotAngleDensity(x)

## End(Not run)
```

`plotTockyLocus` *Produce scatter plots of percentages of cells in each Tocky Locus.*

Description

Produce scatter plots of percentages of cells in each Tocky Locus.

Usage

```
plotTockyLocus(
  x,
  percentTimer = FALSE,
  group_order = NULL,
  locus_colours = NULL,
  group_colors = NULL,
  group_by = TRUE,
  p_adjust_method = "fdr",
  ylim = NULL,
  stats = TRUE,
  verbose = TRUE
)
```

Arguments

`x`	A TockyPrepData object
`percentTimer`	A logical value for whether Percent Timer data is produced. Default is FALSE and produces Percent Parent data.
`group_order`	The order of groups (optional).
`locus_colours`	(optional) to choose colours for Tocky Loci.
`group_colors`	(optional) to choose colours for groups.
`group_by`	A logical value for whether different groups are plotted in different panels.
`p_adjust_method`	A method for p-value adjustment in statistical tests.
`ylim`	(Optional) the range of y values to be displayed.
`stats`	A logical value for whether to produce statistical outputs. This is effective only for two-group analysis.
`verbose`	Logical indicating whether to print Tocky Locus stats. Default is `TRUE`.

Value

A ggplot object

Examples

```
## Not run:
plotTockyLocus(x)

## End(Not run)
```

---

plotTockyLocusLegend *Plot Coloured Tocky Locus Legend*

Description

Plot Coloured Tocky Locus Legend

Usage

```
plotTockyLocusLegend(mar_par = c(4, 4, 10, 4))
```

Arguments

mar_par	parameters for the function mar. The default is c(4, 4, 10, 4)

Value

A plot with colored rectangles and labels.

Examples

```
## Not run:
  plotTockyLocusLegend()

## End(Not run)
```

---

plot_tocky_locus *Generate basic QC plots for Tocky data (Timer-Blue vs Timer-Red 2d plots)*

Description

This function creates quick control plots for the TockyPrepData object analyzing fluorescence changes over time in cellular activities.

Usage

```
plot_tocky_locus(
  x,
  file = "PlotTockyLocus",
  n = 3,
  max_cell_number = 20000,
  viridis = FALSE,
  interactive = FALSE
)
```

Arguments

x	A TockyPrepData object produced by the function prep_tocky.
file	The name of the output file.
n	The number of plots per row and column in the output grid.
max_cell_number	The maximum number of cells to be displayed per panel.
viridis	(Optional). If TRUE, a colour-blind friendly colour set is used.
interactive	(Optional). If TRUE, an interactive session is used to trim plot area.

Value

An unchanged TockyPrepData object, primarily for consistency in pipeline usage.

Examples

```
## Not run:
plot_tocky_locus(data)

## End(Not run)
```

TockyLocus *Calculate Tocky Locus using Timer Angle*

Description

Calculate Tocky Locus using Timer Angle

Usage

```
TockyLocus(x)
```

Arguments

x	A data.frame object or a TockyPrepData object

Value

Input data frame object including Tocky Locus data.

Examples

```
## Not run:
x <- TockyLocus(x)

## End(Not run)
```

TockyLocusLegend *Generate Tocky Locus Legend For a Plot*

Description

Generate Tocky Locus Legend For a Plot

Usage

```
TockyLocusLegend(legend = TRUE, cex = 1, viridis = FALSE)
```

Arguments

legend	A logical arguement.
cex	A numeric value for the text size.
viridis	(Optional). If TRUE, a colour-blind friendly colour set is used.

Examples

```
## Not run:
TockyLocusLegend()

## End(Not run)
```

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