

Package ‘seqLogo’

March 26, 2024

Title Sequence logos for DNA sequence alignments

Version 1.68.0

Description seqLogo takes the position weight matrix of a DNA sequence motif and plots the corresponding sequence logo as introduced by Schneider and Stephens (1990).

LazyLoad yes

Encoding UTF-8

Roxygen list(markdown = TRUE)

RoxygenNote 7.1.2

Imports stats4, grDevices

Depends R (>= 4.2), methods, grid

Suggests knitr, BiocStyle, rmarkdown, testthat

BugReports <https://github.com/ivanek/seqLogo/issues>

VignetteBuilder knitr

Collate AllClasses.R AllGenerics.R pwm.R seqLogo.R

License LGPL (>= 2)

biocViews SequenceMatching

git_url <https://git.bioconductor.org/packages/seqLogo>

git_branch RELEASE_3_18

git_last_commit 8dda53

git_last_commit_date 2023-10-24

Repository Bioconductor 3.18

Date/Publication 2024-03-25

Author Oliver Bembom [aut],
Robert Ivanek [aut, cre] (<<https://orcid.org/0000-0002-8403-056X>>)

Maintainer Robert Ivanek <robert.ivanek@unibas.ch>

R topics documented:

makePWM	2
pwm-class	3
seqLogo	4
Index	6

makePWM	<i>Constructing a pwm object</i>
---------	----------------------------------

Description

This function constructs an object of class `pwm` from a matrix. It checks that the matrix has correct dimensions and that columns add up to 1.0.

Usage

```
makePWM(pwm, alphabet = "DNA")
```

Arguments

<code>pwm</code>	matrix. Numerical matrix representing the position weight matrix.
<code>alphabet</code>	character. The alphabet making up the sequence. Currently, only 'DNA' and 'RNA' is supported.

Value

An object of class `pwm`.

Author(s)

Oliver Bembom

Examples

```
mFile <- system.file("extdata/pwm1", package = "seqLogo")
m <- read.table(mFile)
pwm <- makePWM(m)
```

pwm-class *An S4 class to represent a PWM matrix.*

Description

An object of class 'pwm' represents the alphabet*width position weight matrix of a sequence motif. In case of DNA sequence motif, the entry in row i, column j gives the probability of observing nucleotide c('A', 'C', 'G', 'T')[i] in position j of the motif.

Usage

```
## S4 method for signature 'pwm'  
show(object)  
  
## S4 method for signature 'pwm'  
summary(object, ...)  
  
## S4 method for signature 'pwm,ANY'  
plot(x, y = "missing", ...)  
  
## S4 method for signature 'pwm'  
pwm(pwm)  
  
## S4 method for signature 'pwm'  
ic(pwm)  
  
## S4 method for signature 'pwm'  
consensus(pwm)
```

Arguments

object	object of pwm-class
...	additional parameters for plot function
x	object of pwm-class
y	default (missing) for plot function
pwm	object of pwm-class

Value

pwm-class object with slots: pwm, width, ic and alphabet.

Functions

- show, pwm-method: Shows the position weight matrix.
- summary, pwm-method: Prints the summary information about position weight matrix.
- plot, pwm, ANY-method: Plots the sequence logo of the position weight matrix.

- `pwm`, `pwm-method`: Access to 'pwm' slot
- `ic`, `pwm-method`: Access to 'ic' slot
- `consensus`, `pwm-method`: Access to 'consensus' slot

Slots

`pwm` matrix. The position weight matrix.

`width` numeric. The width of the motif.

`ic` numeric. The information content (IC).

`alphabet` character. The sequence alphabet. Currently, only 'DNA' and 'RNA' is supported.

`consensus` character. The consensus sequence.

Author(s)

Oliver Bembom

Examples

```
mFile <- system.file("extdata/pwm1", package = "seqLogo")
m <- read.table(mFile)
p <- makePWM(m)
#
# slot access
pwm(p)
ic(p)
consensus(p)
```

seqLogo

Plot a sequence logo for a given position weight matrix

Description

This function takes the `alphabet*width` position weight matrix of a sequence motif and plots the corresponding sequence logo.

Usage

```
seqLogo(pwm, ic.scale=TRUE, xaxis=TRUE, yaxis=TRUE, xfontsize=15, yfontsize=15,
        fill=c(A='#61D04F', C='#2297E6', G='#F5C710', T='#DF536B'))
```

Arguments

<code>pwm</code>	numeric. The alphabet*width position weight matrix.
<code>ic.scale</code>	logical. If TRUE, the height of each column is proportional to its information content. Otherwise, all columns have the same height.
<code>xaxis</code>	logical. If TRUE, an X-axis will be plotted.
<code>yaxis</code>	logical. If TRUE, a Y-axis will be plotted.
<code>xfontsize</code>	numeric. Font size to be used for the X-axis.
<code>yfontsize</code>	numeric. Font size to be used for the Y-axis.
<code>fill</code>	character. Fill color to be used for the letters. Must be a named character vector of length equal to number of rows in <code>pwm</code> slot and names identical to its row-names.

Value

NULL.

Author(s)

Oliver Bembom

Examples

```
mFile <- system.file("extdata/pwm1", package = "seqLogo")
m <- read.table(mFile)
p <- makePWM(m)
seqLogo(p)
```

Index

alphabet (pwm-class), [3](#)

consensus (pwm-class), [3](#)
consensus, pwm-method (pwm-class), [3](#)

ic (pwm-class), [3](#)
ic, pwm-method (pwm-class), [3](#)

makePWM, [2](#)

plot, pwm, ANY-method (pwm-class), [3](#)
pwm (pwm-class), [3](#)
pwm, pwm-method (pwm-class), [3](#)
pwm-class, [3](#)

seqLogo, [4](#)
show, pwm-method (pwm-class), [3](#)
summary, pwm-method (pwm-class), [3](#)