

# seqLogo

October 5, 2010

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makePWM

*Constructing a pwm object*

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## 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 representing the position weight matrix
<code>alphabet</code>	character the alphabet making up the sequence. Currently, only "DNA" is supported.

## Value

An object of class `pwm`.

## Author(s)

Oliver Bembom, <bembom@berkeley.edu>

## Examples

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

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pwm-class

*Class "pwm"*

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### Description

An object of class "pwm" represents the  $4 \times W$  position weight matrix of a 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.

### Objects from the Class

Objects can be created by calls of the form `new("pwm", ...)`.

### Slots

`consensus` Object of class "character"

`ic` Object of class "numeric"

`pwm` Object of class "matrix" The position weight matrix.

`width`: "numeric" The width of the motif.

`alphabet`: "character" The sequence alphabet. Currently, only "DNA" is supported.

### Methods

**summary** signature(object = "pwm", ...) Prints the position weight matrix.

**print** signature(x = "pwm", ...) Prints the position weight matrix.

**show** signature(object = "pwm") Prints the position weight matrix.

**plot** signature(x = "pwm") Plots the sequence logo of the position weight matrix.

### Author(s)

Oliver Bembom, <bembom@berkeley.edu>

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seqLogo

*Plot a sequence logo for a given position weight matrix*

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### Description

This function takes the  $4 \times W$  position weight matrix of a DNA sequence motif and plots the corresponding sequence logo.

### Usage

```
seqLogo(pwm, ic.scale=TRUE, xaxis=TRUE, yaxis=TRUE, xfontsize=15, yfontsize=15)
```

**Arguments**

<code>pwm</code>	<code>numeric</code>	The 4xW position weight matrix.
<code>ic.scale</code>	<code>logical</code>	If TRUE, the height of each column is proportional to its information content. Otherwise, all columns have the same height.
<code>xaxis</code>	<code>logical</code>	If TRUE, an X-axis will be plotted.
<code>yaxis</code>	<code>logical</code>	If TRUE, a Y-axis will be plotted.
<code>xfontsize</code>	<code>numeric</code>	Font size to be used for the X-axis.
<code>yfontsize</code>	<code>numeric</code>	Font size to be used for the Y-axis.

**Details**

Within each column, the height of a given letter is proportional to its frequency at that position. If `ic.scale` is TRUE, the height of each column in the plot indicates the information content at that position of the motif. Otherwise, the height of all columns are identical.

**Value**

None.

**Author(s)**

Oliver Bembom, <bembom@berkeley.edu>

**Examples**

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

# Index

## \*Topic **classes**

`pwm-class`, [2](#)

## \*Topic **misc**

`makePWM`, [1](#)

`seqLogo`, [2](#)

`makePWM`, [1](#)

`plot`, `pwm-method` (`pwm-class`), [2](#)

`print`, `pwm-method` (`pwm-class`), [2](#)

`pwm-class`, [2](#)

`seqLogo`, [2](#)

`show`, `pwm-method` (`pwm-class`), [2](#)

`summary`, `pwm-method` (`pwm-class`), [2](#)