Package: caffsim (via r-universe)

September 13, 2024

Title Simulation of Plasma Caffeine Concentrations by Using Population Pharmacokinetic Model

Version 0.2.4.9000

Date 2018-07-16

Description Simulate plasma caffeine concentrations using population pharmacokinetic model described in Lee, Kim, Perera, McLachlan and Bae (2015) <doi:10.1007/s00431-015-2581-x> and the package was published <doi:10.12793/tcp.2017.25.3.141>.

Depends R (>= 3.3.2)

Encoding UTF-8

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LazyData true

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Imports mgcv, dplyr, tidyr, tibble, ggplot2, shiny, markdown

NeedsCompilation no

URL https://github.com/asancpt/caffsim

BugReports https://github.com/asancpt/caffsim/issues

RoxygenNote 6.1.0

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Suggests testthat

Repository https://asancpt.r-universe.dev

RemoteUrl https://github.com/asancpt/caffsim

RemoteRef HEAD

RemoteSha eb8624594259fe87cf1e7ffff4f9e6e13b84009d

Contents

`caffConcTime` *Create a concentration-time dataset of single oral dosing of caffeine*

Description

`caffConcTime` will create a dataset of the concentration-time curve.

Usage

```
caffConcTime(Weight, Dose, N = 20)
```

Arguments

`Weight`	Body weight (kg)
`Dose`	Dose of single caffeine (mg)
`N`	The number of simulated subjects

Value

The dataset of concentration and time of simulated subjects

See Also

https://asancpt.github.io/caffsim

Examples

```
caffConcTime(Weight = 20, Dose = 200, N = 20)
caffConcTime(20, 200)
```

caffConcTimeMulti *Create a concentration-time dataset of multiple oral dosing of caffeine*

Description

`caffConcTimeMulti` will create a dataset of the concentration-time curve of multiple oral administration of caffeine.

Usage

```
caffConcTimeMulti(Weight, Dose, N = 20, Tau = 8, Repeat = 4)
```

Arguments

`Weight`	Body weight (kg)
`Dose`	Dose of single caffeine (mg)
`N`	The number of simulated subjects
`Tau`	The interval of multiple dosing (hour)
`Repeat`	The number of dosing

Value

The dataset of concentration and time of simulated subjects of multiple dosing

See Also

https://asancpt.github.io/caffsim

Examples

```
caffConcTimeMulti(Weight = 20, Dose = 200, N = 20, Tau = 8, Repeat = 4)
caffConcTimeMulti(20, 200)
```

caffDescstat *Calculate descriptive statistics of simulated pharmacokinetic parameters*

Description

`caffDescstat` will calculate descriptive statistics of simulated PK parameters

Usage

```
caffDescstat(caffPkparamData)
```

Arguments

caffPkparamData
: data frame generated by caffPkparam function

Value

The descriptive statistics of pharmacokinetic parameters

See Also

https://asancpt.github.io/caffsim

Examples

```
caffDescstat(caffPkparam(20,500))
caffDescstat(caffPkparamMulti(20,500))
caffDescExample <- cbind(caffDescstat(caffPkparam(20,500)),
                         caffDescstat(caffPkparam(50,500))[,2])
colnames(caffDescExample)[2:3] <- c('20 kg', '50 kg')
caffDescExample
```

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caffOverdose *Calculate a duration of toxic concentration over specified levels (40 mg/L or 80 mg/L)*

Description

caffOverdose calculates a time duration of plasma caffeine concentration over specified toxic limits (40 mg/L or 80 mg/L)

Usage

```
caffOverdose(caffConcTimeData)
```

Arguments

caffConcTimeData
: data frame containing concentration-time data

Value

descriptive statistics of duration of toxic concentrations

See Also

https://asan.shinyapps.io/caff/

Examples

```
caffOverdose(caffConcTime(Weight = 20, Dose = 200, N = 20))
caffOverdose(caffConcTimeMulti(Weight = 20, Dose = 200, N = 20, Tau = 8, Repeat = 4))
```

`caffPkparam` *Create a dataset of pharmacokinetic parameters of single oral dosing of caffeine*

Description

`caffPkparam` will create a dataset for simulation of single dose of caffeine

Usage

```
caffPkparam(Weight, Dose, N = 20)
```

Arguments

`Weight`	Body weight (kg)
`Dose`	Dose of single caffeine (mg)
`N`	The number of simulated subjects

Value

The dataset of pharmacokinetic parameters of subjects after single caffeine dose following multivariate normal

See Also

https://asancpt.github.io/caffsim

Examples

```
caffPkparam(Weight = 20, Dose = 200, N = 20)
caffPkparam(20,500)
```

caffPkparamMulti *Create a dataset of pharmacokinetic parameters of multiple oral dosing of caffeine*

Description

caffPkparamMulti will create a dataset for simulation of multiple dose of caffeine.

Usage

```
caffPkparamMulti(Weight, Dose, N = 20, Tau = 8)
```

Arguments

Weight	Body weight (kg)
Dose	Dose of multiple caffeine (mg)
N	The number of simulated subjects
Tau	The interval of multiple dosing (hour)

Value

The dataset of pharmacokinetic parameters of subjects after multiple caffeine dose following multivariate normal

See Also

https://asancpt.github.io/caffsim

Examples

```
caffPkparamMulti(Weight = 20, Dose = 200, N = 20, Tau = 8)
caffPkparamMulti(20,500)
```

caffPlot *Plot plasma concentration-time curves of single oral dosing of caffeine*

Description

caffPlot will create concentration-time curve after single dose of caffeine

Usage

```
caffPlot(caffConcTimeData, log = FALSE)
```

Arguments

caffConcTimeData	data frame of concentration-time dataset having column names Subject, Time, and Conc (case-sensitive)
log	y axis log

Value

The concentration-time curve

See Also

https://asancpt.github.io/caffsim

Examples

```
caffPlot(caffConcTime(Weight = 20, Dose = 200, N = 20))
```

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caffPlotMulti *Plot plasma concentration-time curves of multiple oral dosing of caffeine*

Description

caffPlotMulti will create concentration-time curve after multiple doses of caffeine

Usage

```
caffPlotMulti(caffConcTimeMultiData, log = FALSE)
```

Arguments

caffConcTimeMultiData	data frame of concentration-time dataset having column names Subject, Time, and Conc (case-sensitive)
log	y axis log

Value

The concentration-time curve

See Also

https://asancpt.github.io/caffsim

Examples

```
caffPlotMulti(caffConcTimeMulti(Weight = 20, Dose = 200, N = 20, Tau = 8, Repeat = 4))
```

caffShiny — *Run Shiny app to interactively simulate single and multiple dosing for plasma caffeine concentration*

Description

caffShiny runs an internal shiny app Caffeine Concentration Predictor in order to interactively simulate plasma caffeine concentration.

Usage

```
caffShiny()
```

See Also

https://asan.shinyapps.io/caff/

UnitTable — *Unit data of PK parameters*

Description

A dataset containing information regarding unit data of pharmacokinetic parameters

Usage

```
UnitTable
```

Format

A data frame with 16 rows and 2 variables:

Parameters Abbreviated pharmacokinetic parameters

Parameter Pharmacokinetic parameters in full name

See Also

https://asancpt.github.io/caffsim

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