Package ‘PKPDmodels’

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Title Pharmacokinetic/pharmacodynamic models
Type Package
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Description Provides functions to evaluate common pharmacokinetic/pharmacodynamic models and their gradients.
Depends R(>= 2.13.0)
Imports compiler
Suggests lattice
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PKexpr  

Expressions for PK models with linear elimination

Description

Return a formula for the PK model with linear elimination according to the number of compartments, the administration form and the dosage pattern.

Usage

```r
PKexpr(admin = c("bolus", "infusion", "oral"),
       dosage = c("sd", "md", "ss"), subst = list(), cpt = 1L)
```

Arguments

- **admin**: form of administration of the drug, one of "bolus", "infusion" or "oral". Defaults to "bolus".
- **dosage**: form of dosage, one of "sd" (single dose), "md" (multiple, equally-spaced doses) and "ss" (steady-state). Defaults to "sd".
- **subst**: a list of formulas of substitutions to perform
- **cpt**: scalar integer - the number of model compartments.

Value

a formula

Examples

```r
## single-dose oral administration
PKexpr("oral", "sd")
```

PKmod

PK models with linear elimination

Description

Create a model function with gradient evaluation (and, optionally, Hessian evaluation) for a model according to the number of compartments, the form of administration and dosage of the drug after performing any substitutions given.

Usage

```r
PKmod(admin = c("bolus", "infusion", "oral"),
       dosage = c("sd", "md", "ss"), subst = list(), cpt = 1L,
       hessian = FALSE)
```
Arguments

admin  form of administration of the drug, one of "bolus", "infusion" or "oral". Defaults to "bolus".
dosage type of dosage of the drug, one of "sd" (single dose), "md" (multiple dose) or "ss" (steady-state). Defaults to "sd".
subst  a list of formulas of substitutions to perform
cpt    scalar integer - the number of model compartments.
hessian a logical value indicating whether the second derivatives should be calculated and incorporated in the return value.

Details

The substitutions are given as a list of formulas, such as `list(k ~ Cl/V, Cl ~ exp(lCl), V ~ exp(lV))`. They are applied left to right.

Value

a byte-compiled model function with gradient evaluation

Examples

```r
## return a function with substitutions
PKmod("bolus", "sd", list(k ~ Cl/V, Cl ~ exp(lCl), V ~ exp(lV)))
```

Description

Substitute the expression `sub` for the name `nm` in `expr` by walking the tree.

Usage

`subexpr(expr, nm, sub)`

Arguments

expr  an expression
nm    a name for which to substitute
sub   the expression to substitute for name `nm`

Value

the expression with all occurrences of `nm` replaced by `sub`

Note

this function is called recursively
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