

S21 lm et glm

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

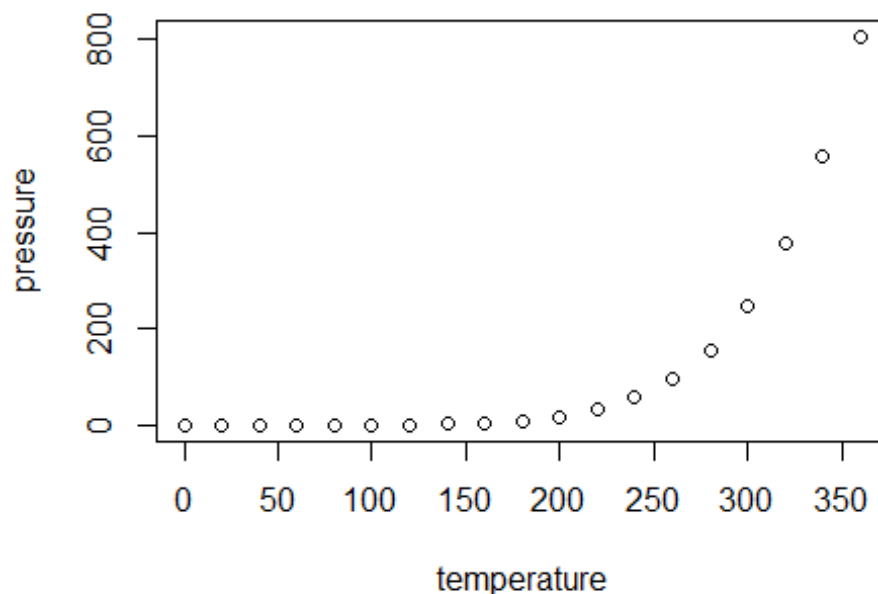
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
summary(cars)
```

```
##      speed      dist
##  Min.   : 4.0    Min.   :  2.00
## 1st Qu.:12.0    1st Qu.: 26.00
##  Median:15.0    Median : 36.00
##  Mean   :15.4    Mean    : 42.98
## 3rd Qu.:19.0    3rd Qu.: 56.00
##  Max.   :25.0    Max.    :120.00
```

Including Plots

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

```
if (!require("pacman")) install.packages("pacman")

## Le chargement a nécessité le package : pacman

pacman::p_load(ade4, Hmisc, tidyverse, data.table, lubridate, kableExtra,
corrplot, PerformanceAnalytics, factoextra, FactoMineR, ggpubr, png, knitr)

library(tidyverse)
library(data.table)
library(lubridate)
library(kableExtra)
library(corrplot)
library(PerformanceAnalytics)
library(factoextra)
library(FactoMineR)
library(ggpubr)
library(ggplot2)
library(png)
library(knitr)
library(readxl)
library(bestNormalize)
library(car)

## Le chargement a nécessité le package : carData

##
## Attachement du package : 'car'

## L'objet suivant est masqué depuis 'package:dplyr':
##
##      recode

## L'objet suivant est masqué depuis 'package:purrr':
##
##      some

library(performance)

Corrmorpho1 <-
read_excel("C:/Users/boule/OneDrive/Bureau/Mémoire/CorrélationS21/Corrmorpho1
.xlsx")
Corrélationexpremeth <- rename(Corrmorpho1, c("Temp"="Temperature",
"Sal"="µS", "Zeloign"="Zéloignée", "LFB"="LatencetoFirstBite"))
CorrélationexpremethA <- rename(Corrélationexpremeth,
c("P"="Poids", "PT"="Poidstesticule", "T/P"="Testicules/poisson"))
CorrélationexpremethA <- mutate(CorrélationexpremethA,
PZproche=Zproche/(Zproche+Zinterm+Zeloign+Zrefuge))
CorrélationexpremethA <- mutate(CorrélationexpremethA,
PZinterm=Zinterm/(Zproche+Zinterm+Zeloign+Zrefuge))
```

```

CorrélationexpremethA <- mutate(CorrélationexpremethA,
PZeloign=Zeloign/(Zproche+Zinterm+Zeloign+Zrefuge))
CorrélationexpremethA <- mutate(CorrélationexpremethA,
PZrefuge=Zrefuge/(Zproche+Zinterm+Zeloign+Zrefuge))

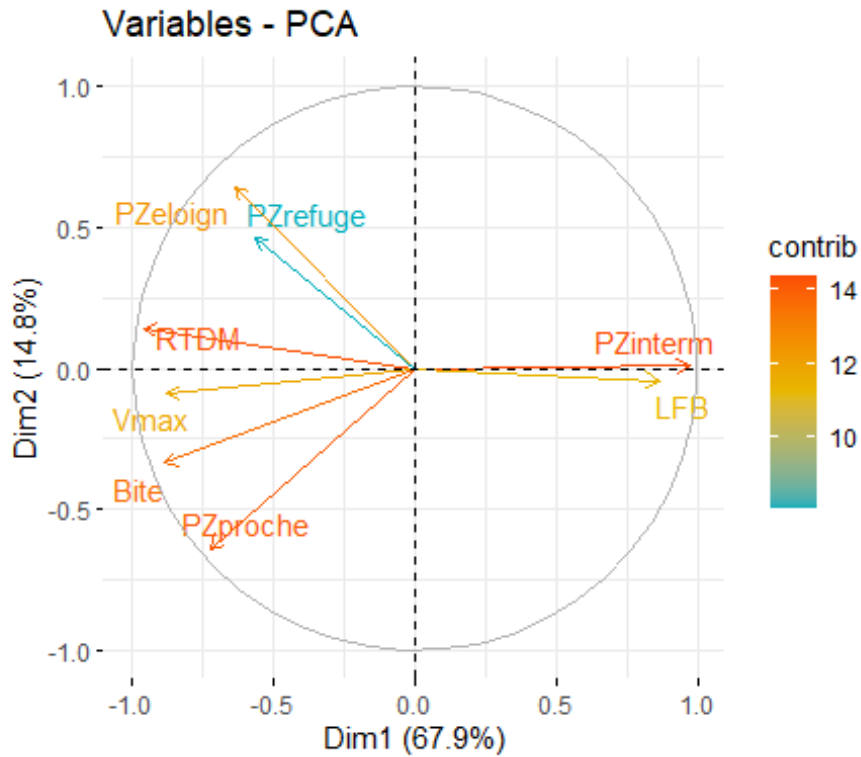
testB <- Corr lationexpremethA[,c("RTDM", "Vmax", "Bite", "PZproche",
"PZinterm", "PZeloign", "PZrefuge", "LFB")]
testB

## # A tibble: 10 x 8
##      RTDM  Vmax  Bite  PZproche  PZinterm  PZeloign  PZrefuge  LFB
##      <dbl> <dbl> <dbl>    <dbl>    <dbl>    <dbl>    <dbl> <dbl>
##  1  79.3  28.9   373    0.689    0.179    0.132    0      28.2
##  2  69.7  16.1   192    0.362    0.223    0.390    0.0251  88.4
##  3  97.6  21.7   315    0.470    0.160    0.344    0.0260  33.1
##  4  18.4  10.5    40    0.132    0.824    0.0437  0      613.
##  5  70.6  19.2   108    0.365    0.277    0.307    0.0510  18
##  6  27.7   9.58    68    0.382    0.459    0.159    0      130.
##  7  91.9  21.3   252    0.469    0.251    0.191    0.0894  95.0
##  8  20.9   9.70    85    0.470    0.469    0.0517  0.00946 278.
##  9  93.4  29.9   252    0.399    0.149    0.412    0.0391  77.8
## 10  26.5  12.6    39    0.162    0.595    0.242    0      231.

correlationB <- rcorr(as.matrix(testB), type = "spearman")

acpB <- dudi.pca(df = testB, center = TRUE, scale = TRUE, scannf = FALSE,
nf=3)
varcontB <- fviz_pca_var(acpB,
                        col.var = "contrib", # Color by the contribution
                        gradient.cols = c("#00AFBB", "#E7B800", "#FC4E07"),
                        repel = T, # Avoid text overlapping
)
varcontB

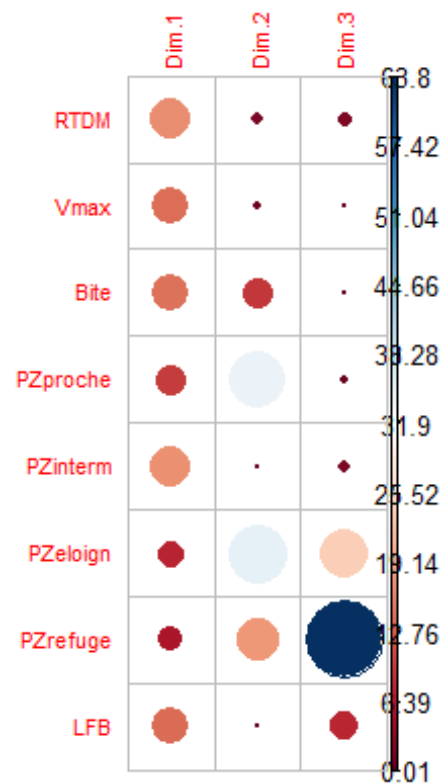
```



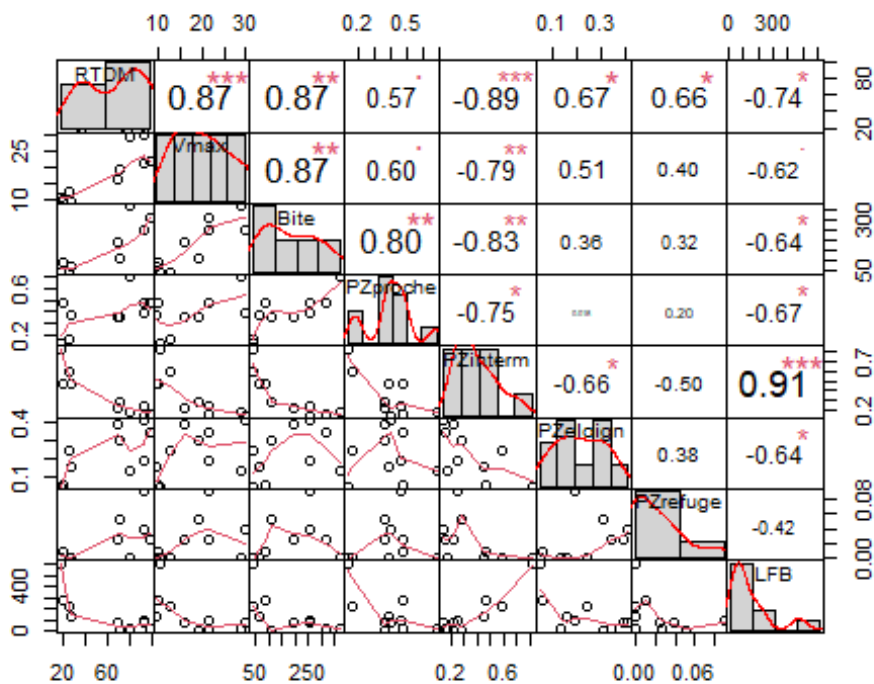
```
res.varB <- get_pca_var(acpB)
varcoordB <- res.varB$coord           # Coordinates
varcontribB <- res.varB$contrib
varcontribB
```

##		Dim.1	Dim.2	Dim.3
##	RTDM	16.963921	1.731701358	1.92851585
##	Vmax	14.194542	0.689121063	0.01463072
##	Bite	14.490950	9.574279931	0.10729511
##	PZproche	9.663152	34.484750022	0.63241620
##	PZinterm	17.495628	0.006640958	1.72363763
##	PZeloign	7.507986	35.214115945	23.97586837
##	PZrefuge	5.897689	18.140863267	63.79700677
##	LFB	13.786131	0.158527455	7.82062935

```
corrplotvarB <- corrplot(res.varB$contrib, is.corr=F, sig.level=0.01,
tl.cex=0.7)
```



```
chart.Correlation(as.matrix(testB[,1:8]), histogram = T, pch=19)
```



```
# I would take RTDM, Zinterm, Bite, Zeloign as response var
# Taille ; T/P ; ND, Temp ; TOLLIPexp ; TLR5exp ; TLR2meth ; TLR7meth ;
```

TollipPMeth as explanatory fixed var

no random effects > LM or GLM

```
testF <-
```

```
CorrélationexpmethA[,c("Taille", "P", "T/P", "PT", "NC", "ND", "NA", "BJ", "BJ/NC",  
"Temp", "Sal")] #subset only the columns of interest
```

```
testF
```

```
## # A tibble: 10 x 11
```

```
##   Taille      P  `T/P`      PT      NC      ND  `NA`      BJ  `BJ/NC`  Temp  Sal  
##   <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>  
## 1  47.6  2.53 0.0119 0.03  97.8  94.8  82.5  31.4  0.321 24.1  625  
## 2  47.1  2.73 0.0135 0.0368 97.1  81.1  58.9  28.3  0.291 24  624  
## 3  46.7  2.34 0.0123 0.0332 125. 105.  80.3  42.6  0.342 23.6 624  
## 4  51.5  3.03 0.0127 0.0322 139.  99  83.4  41.8  0.301 23.5 624  
## 5  48.5  2.56 0.0121 0.0323 136.  95  78.9  39.3  0.289 24  625  
## 6  45.3  2.44 0.0187 0.0438 108.  97.7 57.3  33.9  0.315 23.6 623  
## 7  44.3  2.14 0.013  0.0279 85.1 101.  69.6  26.9  0.316 24.3 625  
## 8  47.5  2.87 0.0118 0.0339 101. 109.  84.3  32.2  0.318 24.5 625  
## 9  45.5  2.45 0.0184 0.0452 97.9 112.  71.9  29.5  0.301 24.3 626  
## 10  52  3.04 0.0214 0.0652 94.5 104.  92.3  28.7  0.304 24.7 627
```

```
correlationF <- rcorr(as.matrix(testF[,1:11]), type = "spearman")
```

```
correlationF
```

```
##      Taille      P      T/P      PT      NC      ND      NA      BJ  BJ/NC  Temp  Sal  
## Taille  1.00  0.87 -0.18  0.07  0.25 -0.18  0.77  0.25 -0.31  0.07  0.30  
## P       0.87  1.00  0.01  0.32  0.10 -0.08  0.66  0.02 -0.43  0.21  0.26  
## T/P    -0.18  0.01  1.00  0.65 -0.36  0.07 -0.33 -0.39 -0.32  0.07  0.06  
## PT      0.07  0.32  0.65  1.00 -0.12  0.33  0.01 -0.13 -0.22  0.29  0.20  
## NC      0.25  0.10 -0.36 -0.12  1.00  0.02  0.10  0.94 -0.18 -0.71 -0.48  
## ND     -0.18 -0.08  0.07  0.33  0.02  1.00  0.36  0.09  0.35  0.41  0.42  
## NA      0.77  0.66 -0.33  0.01  0.10  0.36  1.00  0.22  0.22  0.37  0.49  
## BJ      0.25  0.02 -0.39 -0.13  0.94  0.09  0.22  1.00  0.12 -0.67 -0.46  
## BJ/NC  -0.31 -0.43 -0.32 -0.22 -0.18  0.35  0.22  0.12  1.00  0.15 -0.04  
## Temp    0.07  0.21  0.07  0.29 -0.71  0.41  0.37 -0.67  0.15  1.00  0.86  
## Sal     0.30  0.26  0.06  0.20 -0.48  0.42  0.49 -0.46 -0.04  0.86  1.00
```

```
##
```

```
## n= 10
```

```
##
```

```
##
```

```
## P
```

```
##      Taille P      T/P      PT      NC      ND      NA      BJ      BJ/NC  Temp  
## Taille 0.0012 0.6272 0.8548 0.4888 0.6272 0.0092 0.4888 0.3848
```

```
0.8403
```

```
## P      0.0012      0.9867 0.3655 0.7770 0.8287 0.0376 0.9602 0.2145
```

```
0.5643
```

```
## T/P    0.6272 0.9867      0.0425 0.3104 0.8548 0.3466 0.2600 0.3655
```

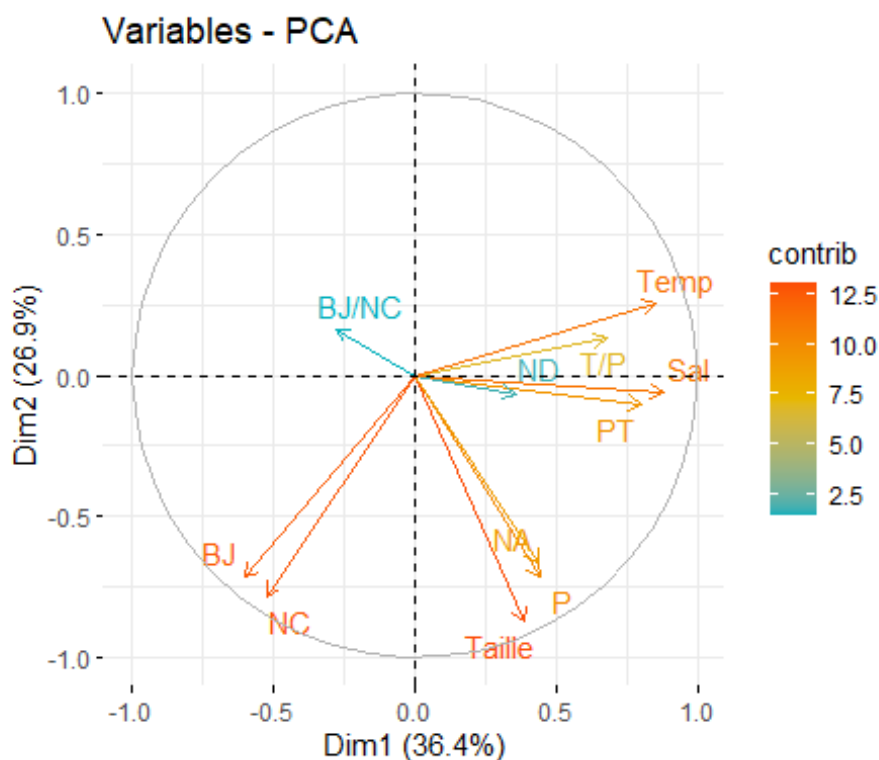
```
0.8403
```

```
## PT     0.8548 0.3655 0.0425      0.7514 0.3466 0.9867 0.7261 0.5334
```

```
0.4206
```



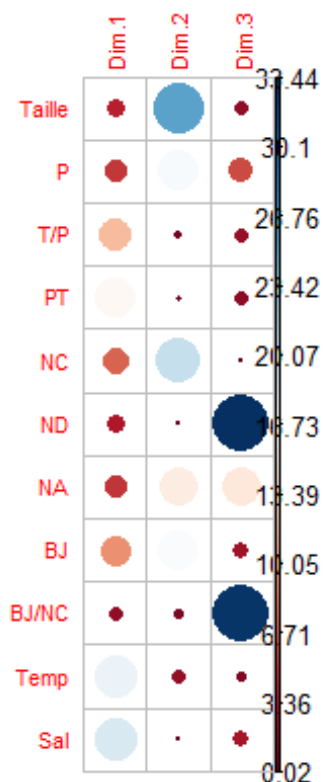
```
acpF <- dudi.pca(df = testF, center = TRUE, scale = TRUE, scannf = FALSE,
nf=3)
varcontF <- fviz_pca_var(acpF,
  col.var = "contrib", # Color by the contribution
  gradient.cols = c("#00AFBB", "#E7B800", "#FC4E07"),
  repel = T, # Avoid text overlapping
)
varcontF
```



```
res.varF <- get_pca_var(acpF)
varcoordF <- res.varF$coord # Coordinates
varcontribF <- res.varF$contrib
varcontribF
```

	Dim.1	Dim.2	Dim.3
## Taille	3.719979	25.6746672	1.90477852
## P	4.869498	17.2658078	5.78686560
## T/P	11.547267	0.5867630	2.30264378
## PT	16.225380	0.3590107	1.85111336
## NC	6.928478	20.6070548	0.02026125
## ND	3.214861	0.1440099	33.44417254
## NA	4.776244	14.9623437	14.69541776
## BJ	9.057254	17.1942013	2.67136310
## BJ/NC	1.946063	0.8930780	33.08301756
## Temp	18.195339	2.1918447	1.28097512
## Sal	19.519637	0.1212190	2.95939141


```
corrplotvarF <- corrplot(res.varF$contrib, is.corr=F, sig.level=0.01,
tl.cex=0.7)
```



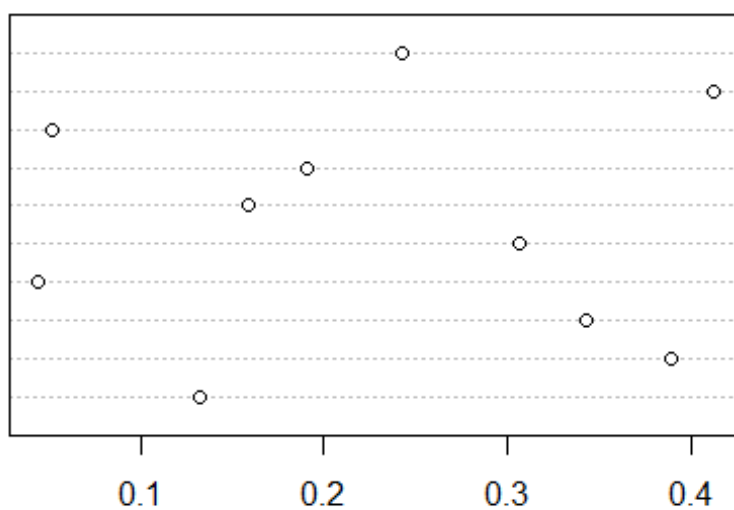
```
# Taille ; NC ; Sal et T/P ; TOLLIPexp ; TLR5exp ; TLR2meth ; TLR7meth ;
TollipPMeth as explanatory fixed var
```

```
#Test sur nos variables d'intérêts
```

```
testFinale <- CorrélacionexpmethA [,c("PZeloign", "Bite",
"PZinterm", "RTDM", "Individu", "NC", "Taille", "Sal", "TOLLIPexp",
"TLR5exp", "TollipPMeth", "TLR2Meth", "TLR7Meth", "PT")] #subset only the columns
of interest
```

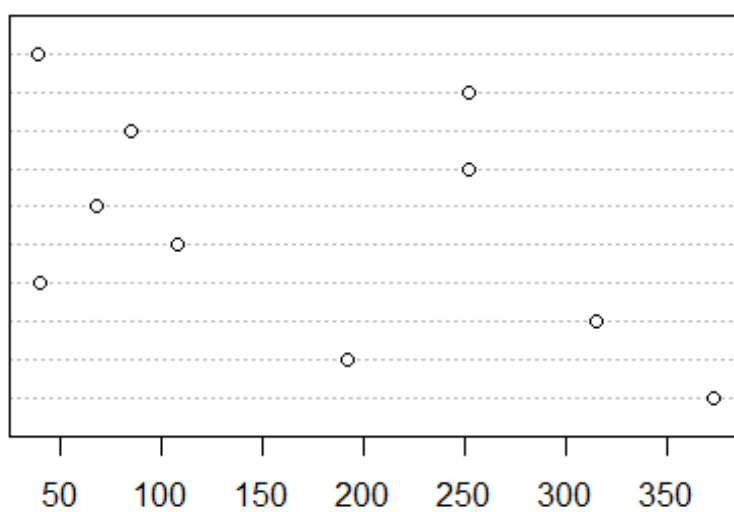
```
dotchart(testFinale$PZeloign, main="Zeloign") # ok
```

Zeloign



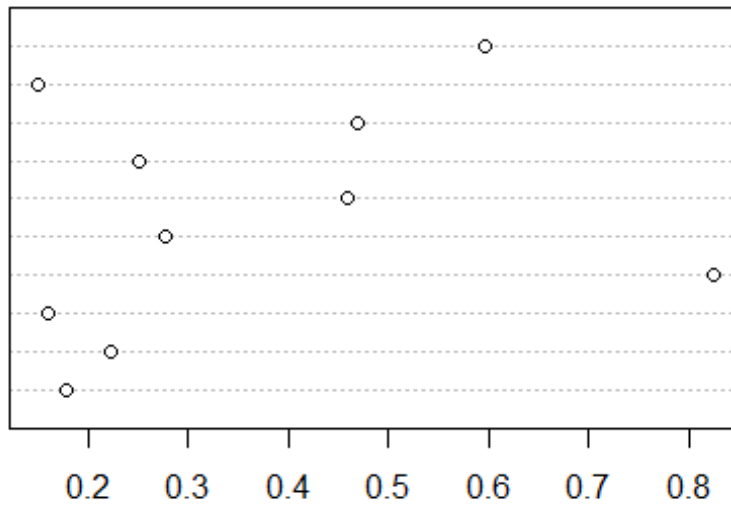
```
dotchart(testFinale$Bite, main="Bite") # ok
```

Bite



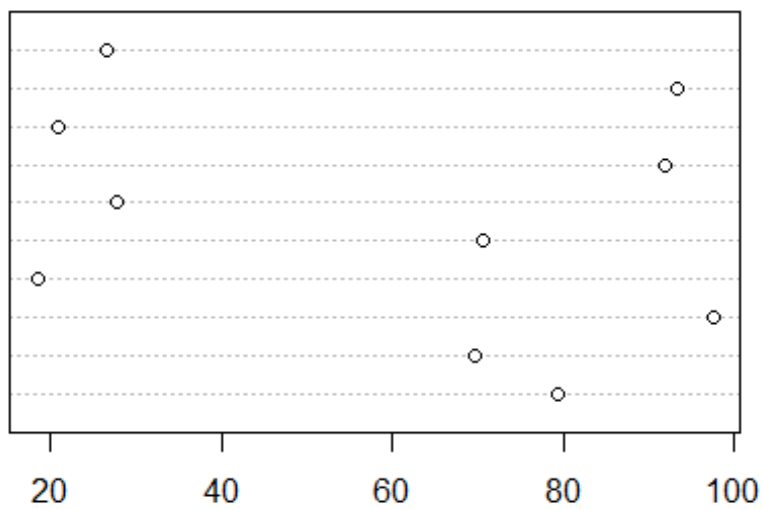
```
dotchart(testFinale$PZinterm, main="PZinterm")# ok
```

PZinterm

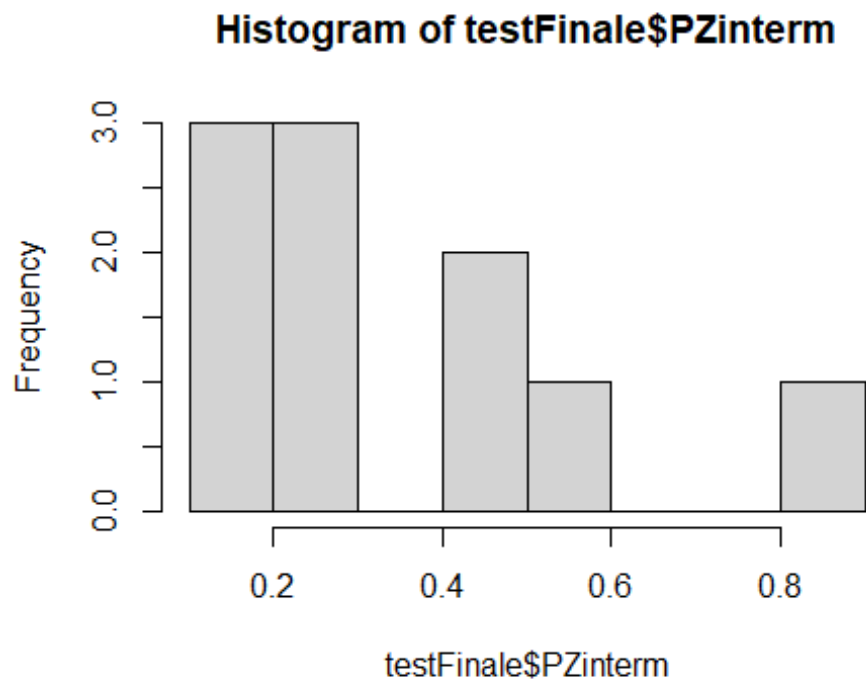


```
dotchart(testFinale$RTDM, main="RTDM")# ok
```

RTDM



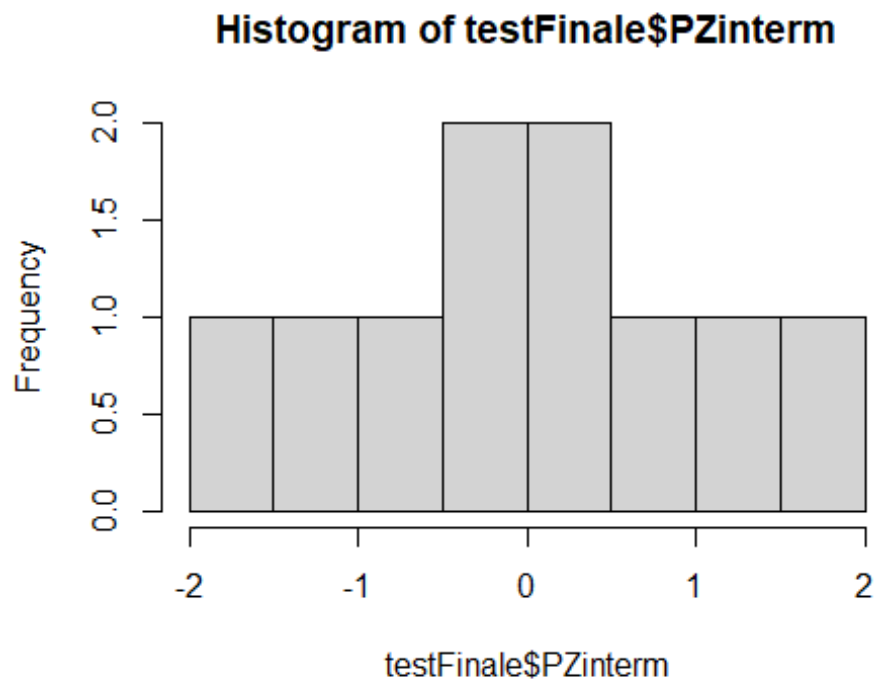
```
hist(testFinale$PZinterm) # not normal at all
```



```
shapiro.test(testFinale$PZinterm)

##
##  Shapiro-Wilk normality test
##
## data:  testFinale$PZinterm
## W = 0.86684, p-value = 0.09182

PZinterm<- orderNorm(testFinale$PZinterm)
x2 <- predict(PZinterm)
testFinale$PZinterm<- x2
hist(testFinale$PZinterm)#ok
```



```
shapiro.test(testFinale$PZinterm)
```

```
##
```

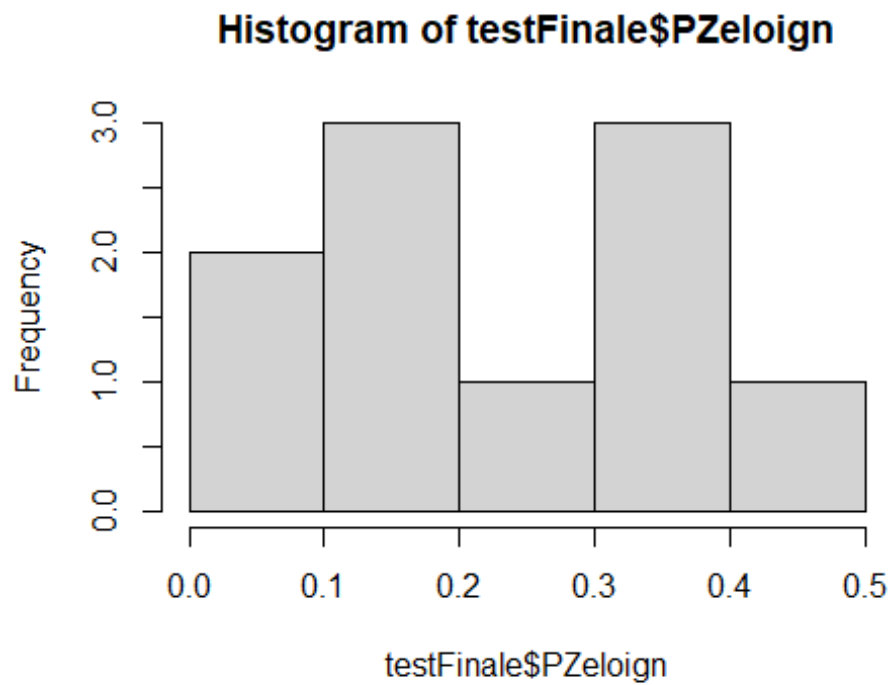
```
##  Shapiro-Wilk normality test
```

```
##
```

```
## data:  testFinale$PZinterm
```

```
## W = 0.99798, p-value = 1
```

```
hist(testFinale$PZeloign) # normality acceptable
```



```
shapiro.test(testFinale$PZeloign)
```

```
##
```

```
##  Shapiro-Wilk normality test
```

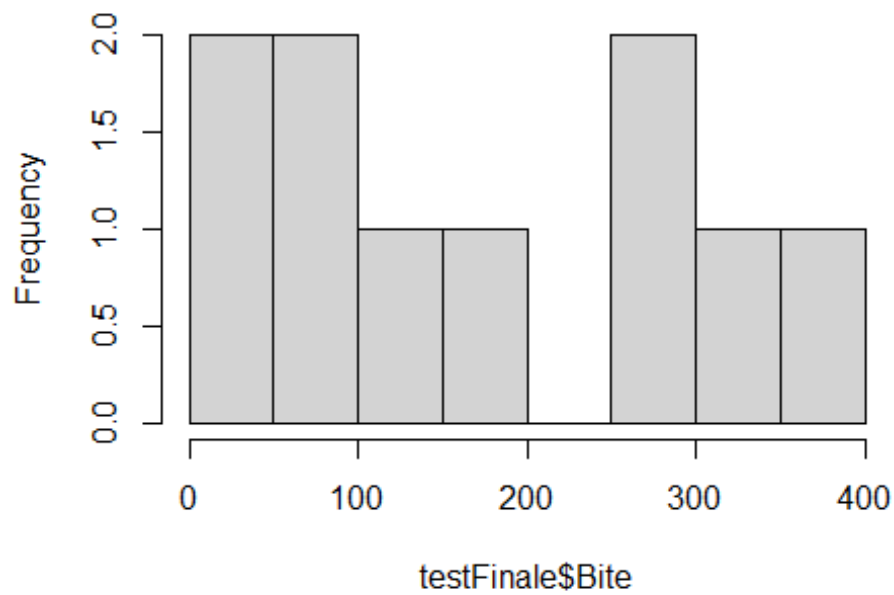
```
##
```

```
## data:  testFinale$PZeloign
```

```
## W = 0.94026, p-value = 0.5559
```

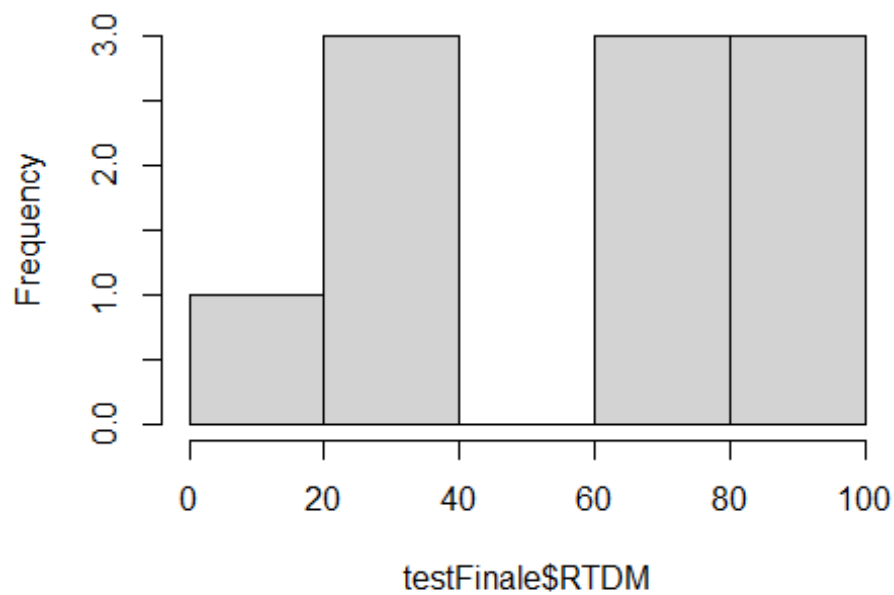
```
hist(testFinale$Bite)# normality not ok comptage
```

Histogram of testFinale\$Bite



```
hist(testFinale$RTDM) #normality acceptable
```

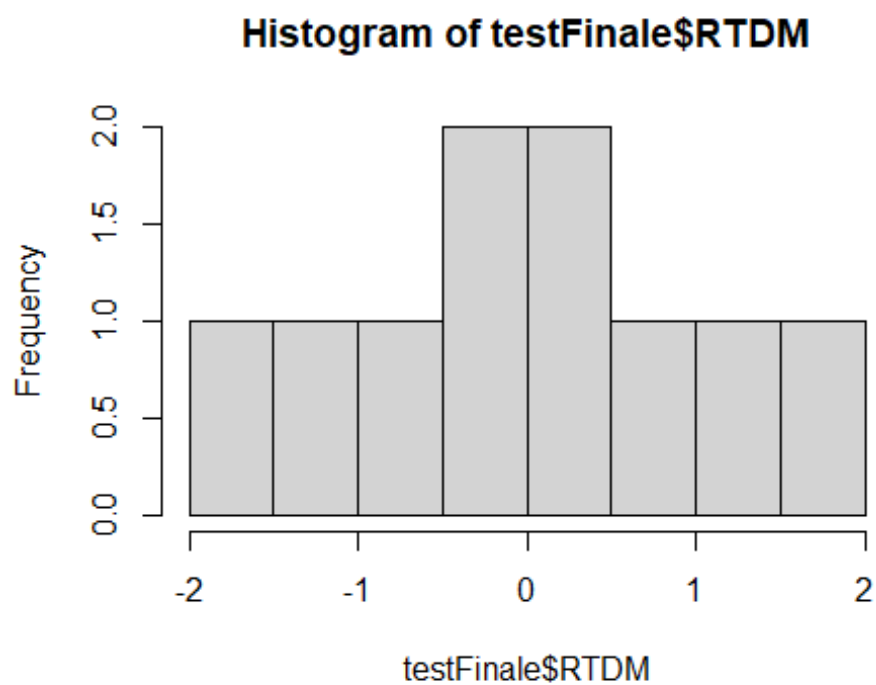
Histogram of testFinale\$RTDM



```
shapiro.test(testFinale$RTDM)
```

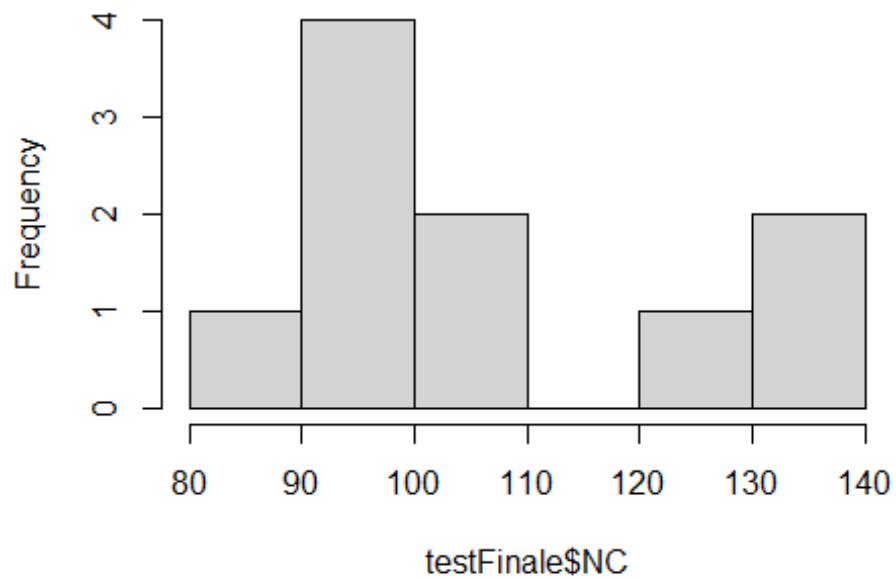
```
##
##  Shapiro-Wilk normality test
##
## data:  testFinale$RTDM
## W = 0.84238, p-value = 0.04712

RTDM<- orderNorm(testFinale$RTDM)
x2 <- predict(RTDM)
testFinale$RTDM<- x2
hist(testFinale$RTDM)#ok
```



```
hist(testFinale$NC)# normality ok
```


Histogram of testFinale\$NC

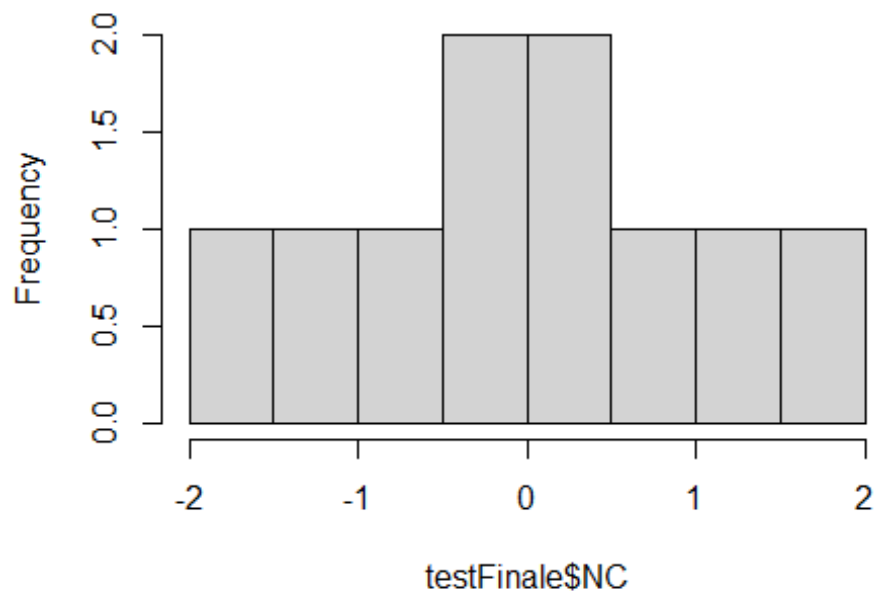


```
shapiro.test(testFinale$NC)

##
##  Shapiro-Wilk normality test
##
## data:  testFinale$NC
## W = 0.86658, p-value = 0.09117

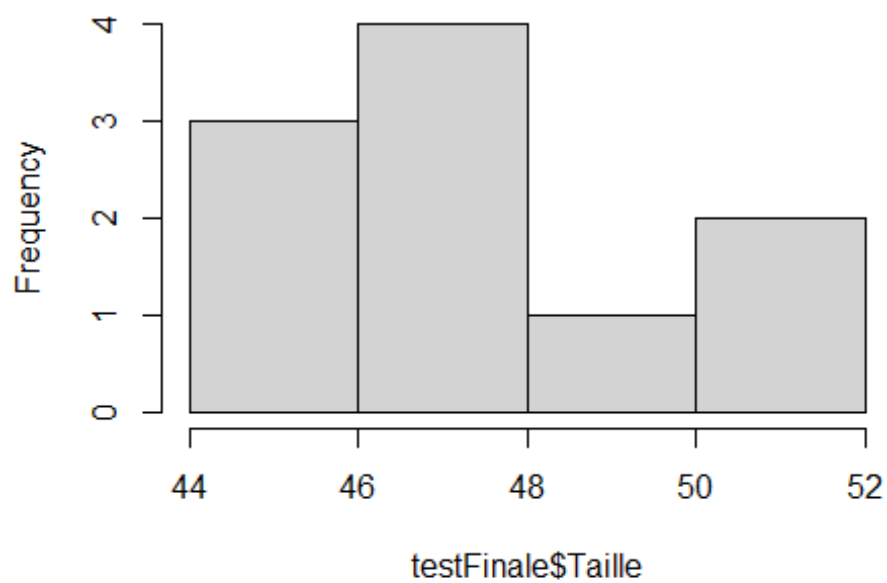
NC <- orderNorm(testFinale$NC)
x2 <- predict(NC)
testFinale$NC <- x2
hist(testFinale$NC)#ok
```

Histogram of testFinale\$NC



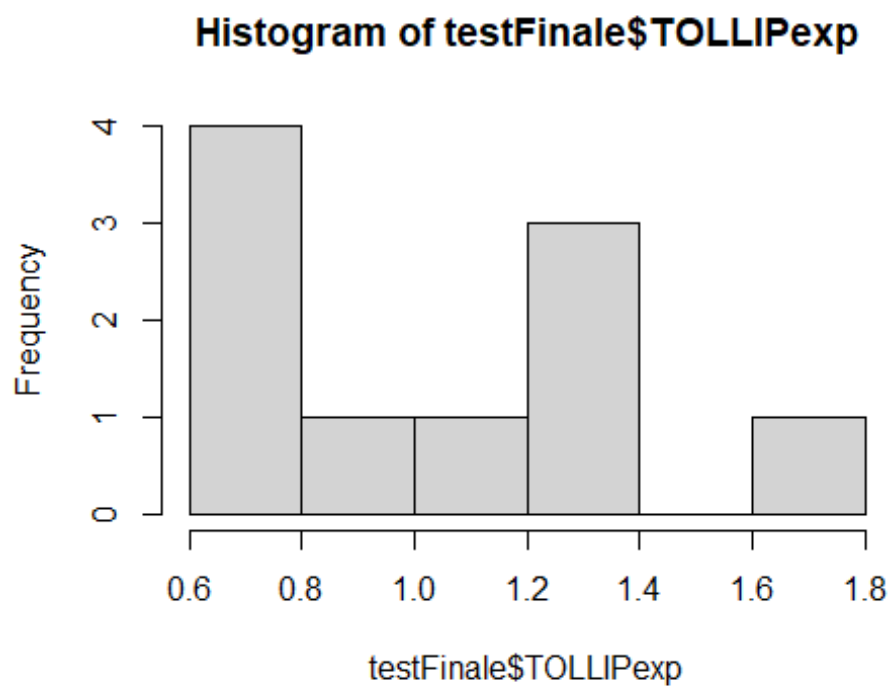
```
hist(testFinale$Taille) # normality ok
```

Histogram of testFinale\$Taille



```
shapiro.test(testFinale$Taille)
```

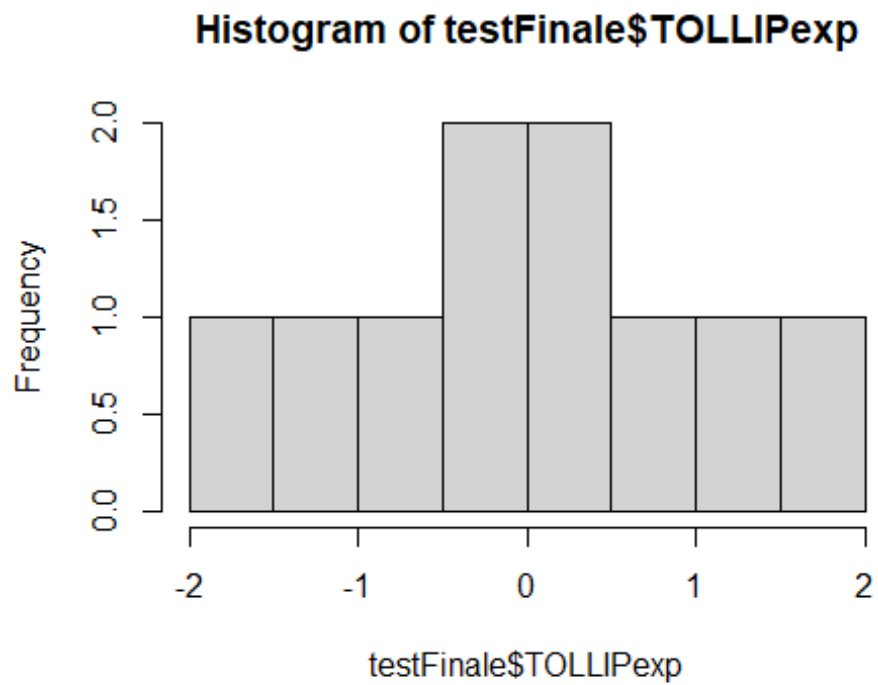
```
##
## Shapiro-Wilk normality test
##
## data: testFinale$Taille
## W = 0.91562, p-value = 0.3218
hist(testFinale$TOLLIPexp) # normality ok
```



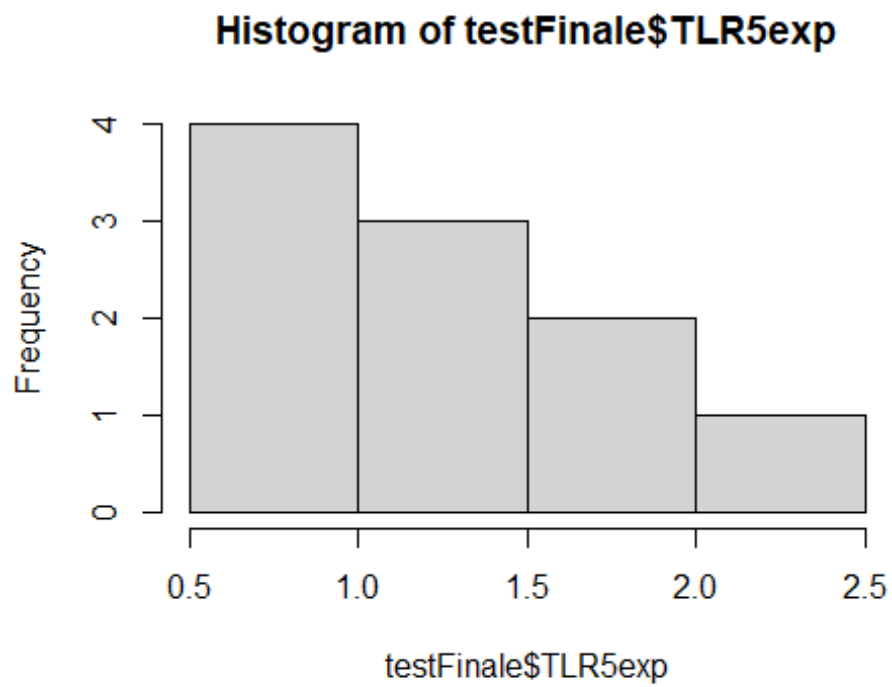
```
shapiro.test(testFinale$TOLLIPexp)

##
## Shapiro-Wilk normality test
##
## data: testFinale$TOLLIPexp
## W = 0.90785, p-value = 0.2666

TOLLIPexp <- orderNorm(testFinale$TOLLIPexp)
x2 <- predict(TOLLIPexp)
testFinale$TOLLIPexp <- x2
hist(testFinale$TOLLIPexp) #ok
```

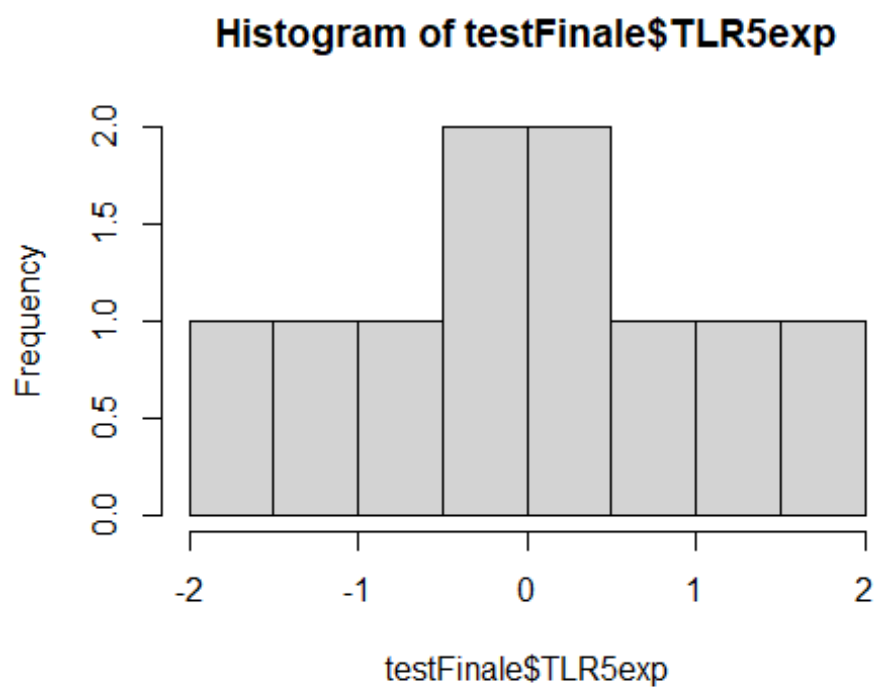


```
hist(testFinale$TLR5exp)# normality not ok
```



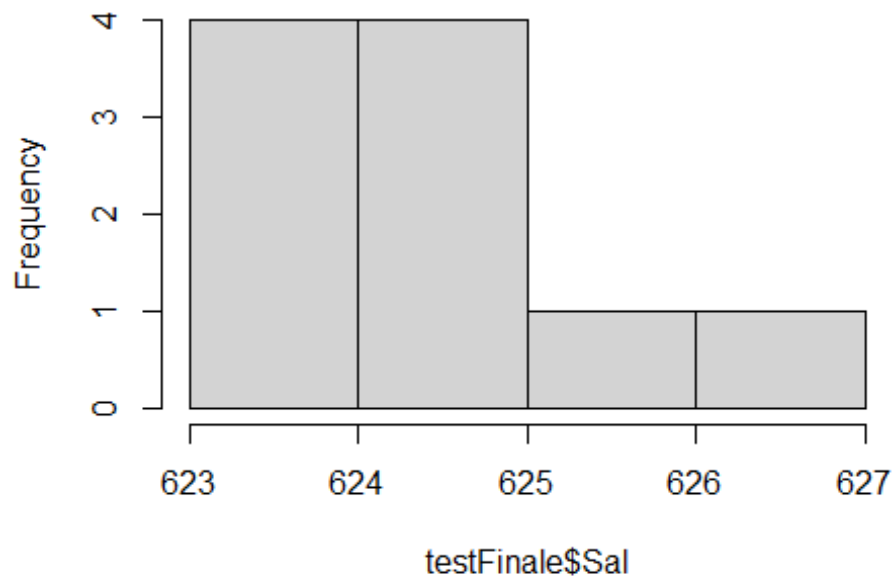
```
shapiro.test(testFinale$TLR5exp)
```

```
##  
## Shapiro-Wilk normality test  
##  
## data: testFinale$TLR5exp  
## W = 0.92161, p-value = 0.3706  
  
TLR5exp <- orderNorm(testFinale$TLR5exp)  
x2 <- predict(TLR5exp)  
testFinale$TLR5exp <- x2  
hist(testFinale$TLR5exp) #ok
```



```
hist(testFinale$Sal)
```

Histogram of testFinale\$Sal



```
shapiro.test(testFinale$Sal)# normality ok

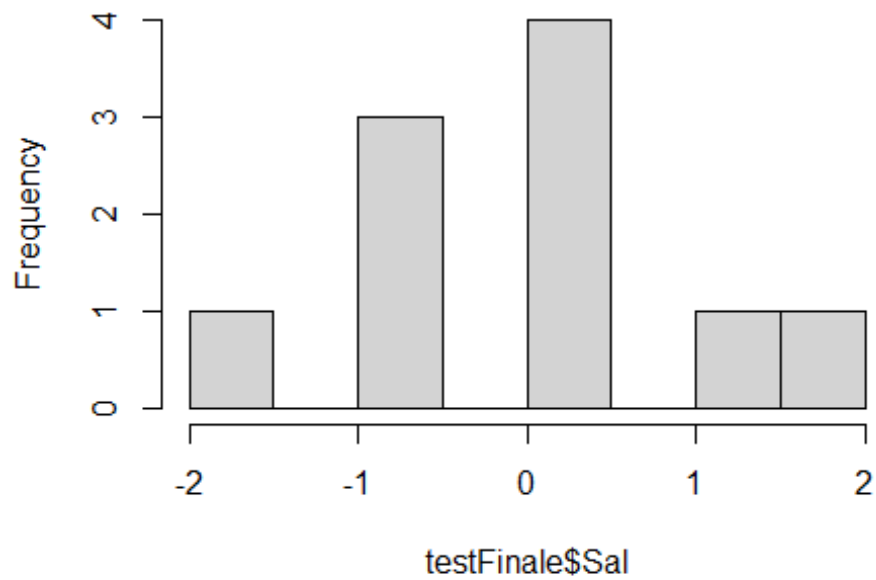
##
##  Shapiro-Wilk normality test
##
## data:  testFinale$Sal
## W = 0.93308, p-value = 0.4788

Sal <- orderNorm(testFinale$Sal)

## Warning in orderNorm(testFinale$Sal): Ties in data, Normal distribution
not guaranteed

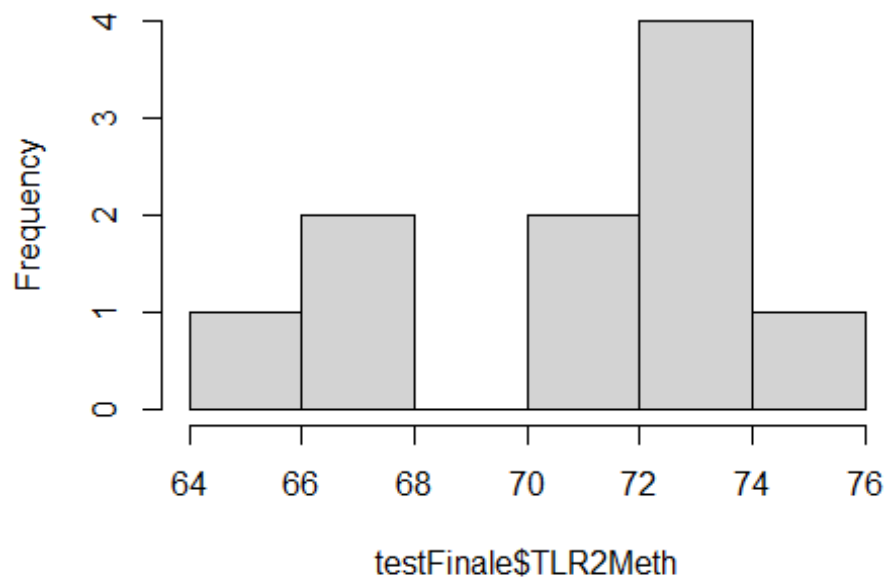
x2 <- predict(Sal)
testFinale$Sal <- x2
hist(testFinale$Sal)
```

Histogram of testFinale\$Sal



```
hist(testFinale$TLR2Meth)
```

Histogram of testFinale\$TLR2Meth



```
shapiro.test(CorrélationexpremethA$TLR2Meth)
```

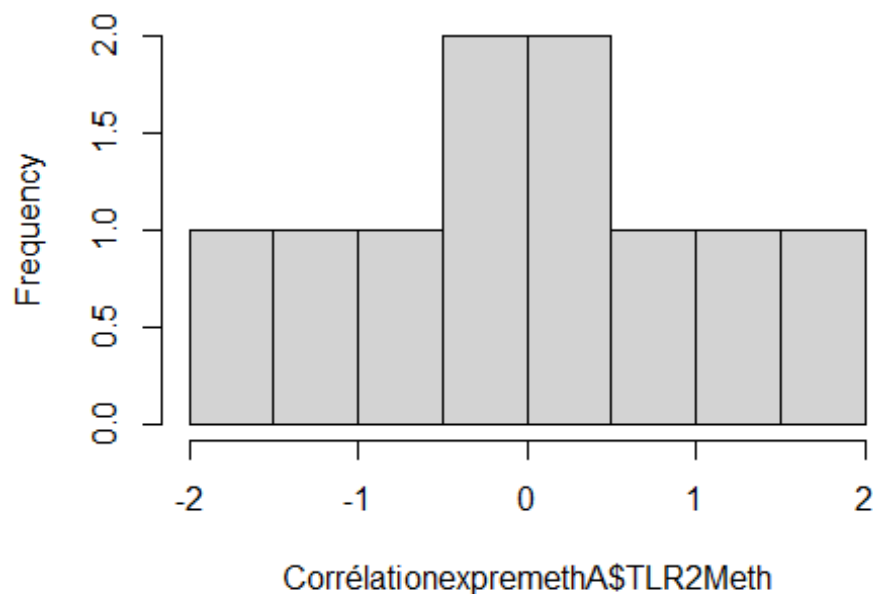
```
##
##  Shapiro-Wilk normality test
##
## data:  CorrélacionexpremethA$TLR2Meth
## W = 0.83257, p-value = 0.03593

TLR2Meth <- orderNorm(CorrélacionexpremethA$TLR2Meth)

## Warning in orderNorm(CorrélacionexpremethA$TLR2Meth): Ties in data, Normal
distribution not guaranteed

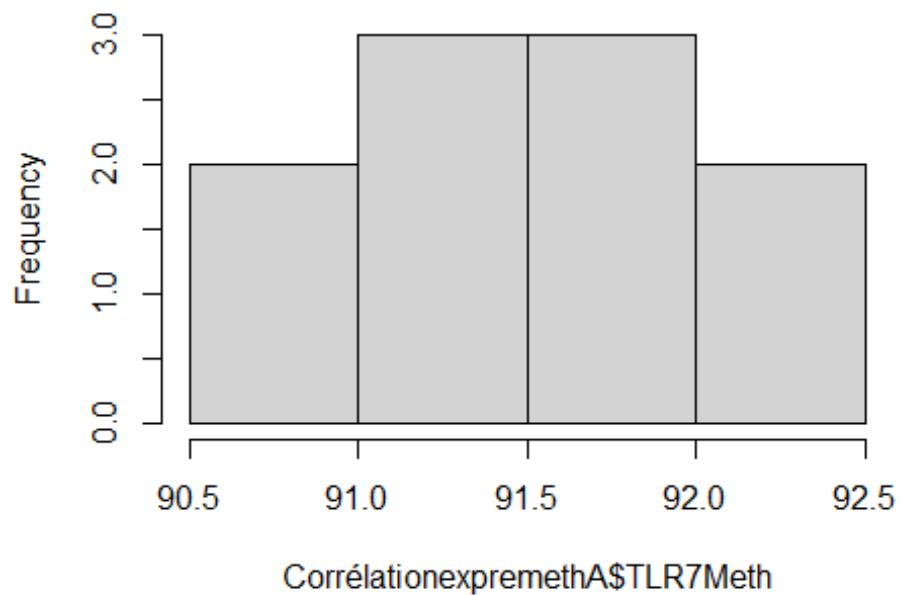
x2 <- predict(TLR2Meth)
CorrélacionexpremethA$TLR2Meth <- x2
hist(CorrélacionexpremethA$TLR2Meth)#ok
```

Histogram of CorrélacionexpremethA\$TLR2Meth



```
hist(CorrélacionexpremethA$TLR7Meth)
```


Histogram of CorrélacionexpremethA\$TLR7Meth



```
shapiro.test(CorrélacionexpremethA$TLR7Meth)#ok
```

```
##
```

```
## Shapiro-Wilk normality test
```

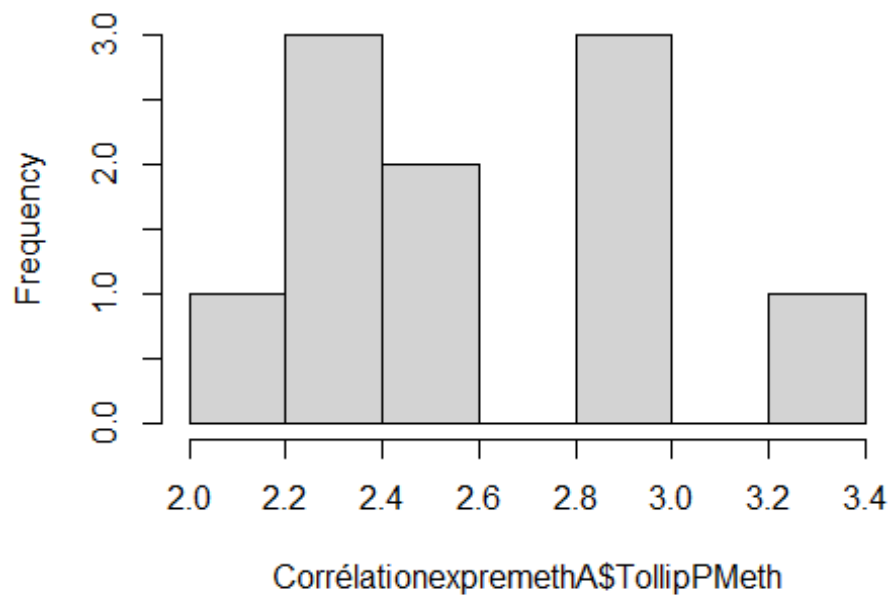
```
##
```

```
## data: CorrélacionexpremethA$TLR7Meth
```

```
## W = 0.94569, p-value = 0.6178
```

```
hist(CorrélacionexpremethA$TollipPMeth)
```

Histogram of CorrélacionexpremethA\$TollipPMeth



```
shapiro.test(CorrélacionexpremethA$TollipPMeth)

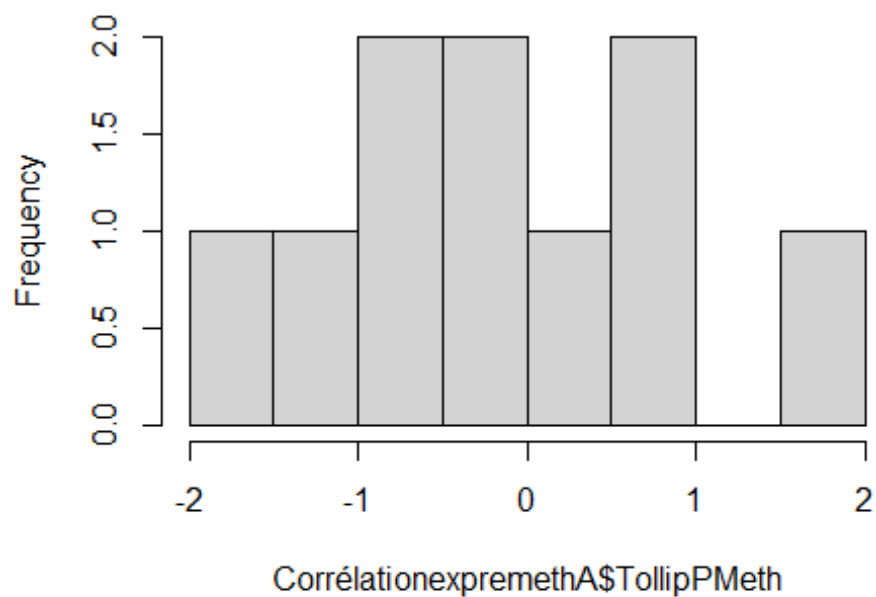
##
##  Shapiro-Wilk normality test
##
## data:  CorrélacionexpremethA$TollipPMeth
## W = 0.94578, p-value = 0.6189

TollipPMeth <- orderNorm(CorrélacionexpremethA$TollipPMeth)

## Warning in orderNorm(CorrélacionexpremethA$TollipPMeth): Ties in data,
Normal distribution not guaranteed

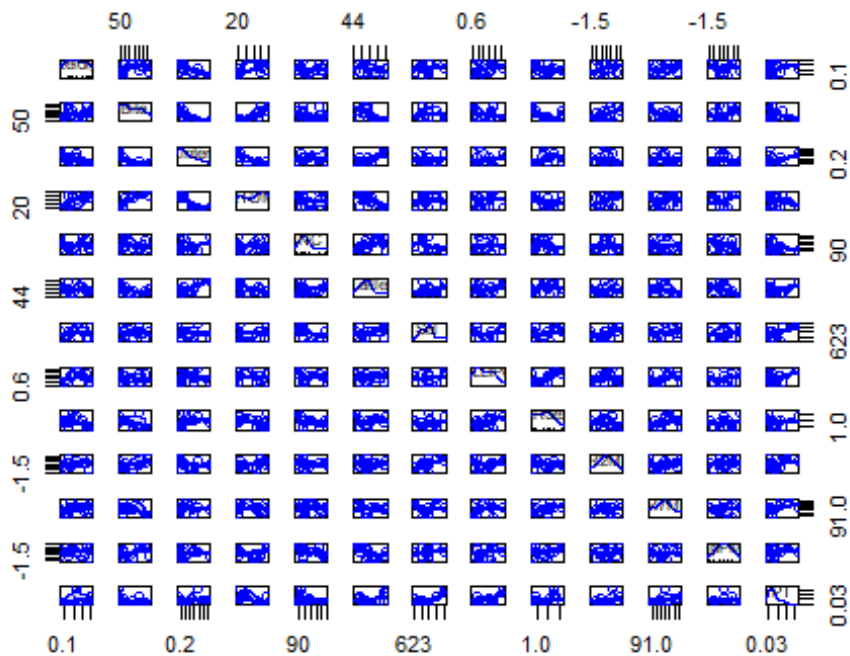
x2 <- predict(TollipPMeth)
CorrélacionexpremethA$TollipPMeth <- x2
hist(CorrélacionexpremethA$TollipPMeth) #ok
```

Histogram of CorrélationexpremethA\$TollipPMeth



```
Variablenum <- CorrélationexpremethA[,c("PZeloign", "Bite",  
"PZinterm", "RTDM", "NC", "Taille", "Sal", "TOLLIPexp",  
"TLR5exp", "TLR2Meth", "TLR7Meth", "TollipPMeth", "PT")] #subset only the columns  
of interest
```

```
scatterplotMatrix(Variablenum)
```



```
#RTDM
Mod1A <-
lm(RTDM~Individu+NC+Sal+PT+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth+TLR2Meth+TOLLIPexp*TollipPMeth+NC*TOLLIPexp+NC*TLR5exp+NC*TLR7Meth+NC*TollipPMeth+NC*TLR2Meth, data=testFinale)
summary(Mod1A)

##
## Call:
## lm(formula = RTDM ~ Individu + NC + Sal + PT + TOLLIPexp + TLR5exp +
##     TLR7Meth + TollipPMeth + TLR2Meth + TOLLIPexp * TollipPMeth +
##     NC * TOLLIPexp + NC * TLR5exp + NC * TLR7Meth + NC * TollipPMeth +
##     NC * TLR2Meth, data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients: (6 not defined because of singularities)
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -336.2786         NaN      NaN    NaN
## Individu       -0.2029         NaN      NaN    NaN
## NC              0.9108         NaN      NaN    NaN
## Sal            2.7473          NaN      NaN    NaN
## PT            23.1447          NaN      NaN    NaN
## TOLLIPexp       1.8989         NaN      NaN    NaN
## TLR5exp        -0.4276         NaN      NaN    NaN
## TLR7Meth        4.0107         NaN      NaN    NaN
```

```

## TollipPMeth          4.2917      NaN      NaN      NaN
## TLR2Meth             -0.4311      NaN      NaN      NaN
## TOLLIPexp:TollipPMeth      NA      NA      NA      NA
## NC:TOLLIPexp          NA      NA      NA      NA
## NC:TLR5exp           NA      NA      NA      NA
## NC:TLR7Meth          NA      NA      NA      NA
## NC:TollipPMeth        NA      NA      NA      NA
## NC:TLR2Meth          NA      NA      NA      NA
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared:      1, Adjusted R-squared:      NaN
## F-statistic:      NaN on 9 and 0 DF,  p-value: NA

Mod11A <-
lm(RTDM~Individu+NC+Sal+PT+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth+TLR2Meth+TO
LLIPexp*TollipPMeth+NC*TOLLIPexp+NC*TLR5exp+NC*TLR7Meth+NC*TollipPMeth,
data=testFinale)
summary(Mod11A)

##
## Call:
## lm(formula = RTDM ~ Individu + NC + Sal + PT + TOLLIPexp + TLR5exp +
##      TLR7Meth + TollipPMeth + TLR2Meth + TOLLIPexp * TollipPMeth +
##      NC * TOLLIPexp + NC * TLR5exp + NC * TLR7Meth + NC * TollipPMeth,
##      data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients: (5 not defined because of singularities)
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   -336.2786         NaN      NaN      NaN
## Individu      -0.2029         NaN      NaN      NaN
## NC             0.9108         NaN      NaN      NaN
## Sal           2.7473         NaN      NaN      NaN
## PT            23.1447         NaN      NaN      NaN
## TOLLIPexp      1.8989         NaN      NaN      NaN
## TLR5exp       -0.4276         NaN      NaN      NaN
## TLR7Meth       4.0107         NaN      NaN      NaN
## TollipPMeth    4.2917         NaN      NaN      NaN
## TLR2Meth      -0.4311         NaN      NaN      NaN
## TOLLIPexp:TollipPMeth      NA      NA      NA      NA
## NC:TOLLIPexp      NA      NA      NA      NA
## NC:TLR5exp       NA      NA      NA      NA
## NC:TLR7Meth      NA      NA      NA      NA
## NC:TollipPMeth    NA      NA      NA      NA
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared:      1, Adjusted R-squared:      NaN
## F-statistic:      NaN on 9 and 0 DF,  p-value: NA

```

```

Mod12A <-
lm(RTDM~Individu+NC+Sal+PT+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth+TLR2Meth+TO
LLIPexp*TollipPMeth+NC*TOLLIPexp+NC*TLR5exp+NC*TLR7Meth, data=testFinale)
summary(Mod12A)

##
## Call:
## lm(formula = RTDM ~ Individu + NC + Sal + PT + TOLLIPexp + TLR5exp +
##     TLR7Meth + TollipPMeth + TLR2Meth + TOLLIPexp * TollipPMeth +
##     NC * TOLLIPexp + NC * TLR5exp + NC * TLR7Meth, data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients: (4 not defined because of singularities)
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -336.2786         NaN      NaN      NaN
## Individu        -0.2029         NaN      NaN      NaN
## NC              0.9108         NaN      NaN      NaN
## Sal             2.7473         NaN      NaN      NaN
## PT             23.1447         NaN      NaN      NaN
## TOLLIPexp       1.8989         NaN      NaN      NaN
## TLR5exp        -0.4276         NaN      NaN      NaN
## TLR7Meth        4.0107         NaN      NaN      NaN
## TollipPMeth     4.2917         NaN      NaN      NaN
## TLR2Meth       -0.4311         NaN      NaN      NaN
## TOLLIPexp:TollipPMeth      NA          NA      NA      NA
## NC:TOLLIPexp      NA          NA      NA      NA
## NC:TLR5exp        NA          NA      NA      NA
## NC:TLR7Meth       NA          NA      NA      NA
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared: 1, Adjusted R-squared: NaN
## F-statistic: NaN on 9 and 0 DF, p-value: NA

Mod13A <-
lm(RTDM~Individu+NC+Sal+PT+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth+TLR2Meth+TO
LLIPexp*TollipPMeth+NC*TOLLIPexp+NC*TLR5exp, data=testFinale)
summary(Mod13A)

##
## Call:
## lm(formula = RTDM ~ Individu + NC + Sal + PT + TOLLIPexp + TLR5exp +
##     TLR7Meth + TollipPMeth + TLR2Meth + TOLLIPexp * TollipPMeth +
##     NC * TOLLIPexp + NC * TLR5exp, data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients: (3 not defined because of singularities)
##              Estimate Std. Error t value Pr(>|t|)

```

```

## (Intercept)          -336.2786      NaN      NaN      NaN
## Individu             -0.2029      NaN      NaN      NaN
## NC                   0.9108      NaN      NaN      NaN
## Sal                  2.7473      NaN      NaN      NaN
## PT                   23.1447      NaN      NaN      NaN
## TOLLIPexp            1.8989      NaN      NaN      NaN
## TLR5exp              -0.4276      NaN      NaN      NaN
## TLR7Meth             4.0107      NaN      NaN      NaN
## TollipPMeth          4.2917      NaN      NaN      NaN
## TLR2Meth             -0.4311      NaN      NaN      NaN
## TOLLIPexp:TollipPMeth      NA      NA      NA      NA
## NC:TOLLIPexp          NA      NA      NA      NA
## NC:TLR5exp           NA      NA      NA      NA
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared:      1, Adjusted R-squared:      NaN
## F-statistic:      NaN on 9 and 0 DF,  p-value: NA

Mod14A <-
lm(RTDM~Individu+NC+Sal+PT+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth+TLR2Meth+TOLLIPexp*TollipPMeth+NC*TOLLIPexp, data=testFinale)
summary(Mod14A)

##
## Call:
## lm(formula = RTDM ~ Individu + NC + Sal + PT + TOLLIPexp + TLR5exp +
##      TLR7Meth + TollipPMeth + TLR2Meth + TOLLIPexp * TollipPMeth +
##      NC * TOLLIPexp, data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients: (2 not defined because of singularities)
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -336.2786      NaN      NaN      NaN
## Individu        -0.2029      NaN      NaN      NaN
## NC              0.9108      NaN      NaN      NaN
## Sal             2.7473      NaN      NaN      NaN
## PT              23.1447      NaN      NaN      NaN
## TOLLIPexp        1.8989      NaN      NaN      NaN
## TLR5exp         -0.4276      NaN      NaN      NaN
## TLR7Meth         4.0107      NaN      NaN      NaN
## TollipPMeth      4.2917      NaN      NaN      NaN
## TLR2Meth        -0.4311      NaN      NaN      NaN
## TOLLIPexp:TollipPMeth      NA      NA      NA      NA
## NC:TOLLIPexp      NA      NA      NA      NA
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared:      1, Adjusted R-squared:      NaN
## F-statistic:      NaN on 9 and 0 DF,  p-value: NA

```

```
Mod15A <-
lm(RTDM~Individu+NC+Sal+PT+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth+TLR2Meth+TO
LLIPexp*TollipPMeth, data=testFinale)
summary(Mod15A) #fonctionne pas
```

```
##
## Call:
## lm(formula = RTDM ~ Individu + NC + Sal + PT + TOLLIPexp + TLR5exp +
##     TLR7Meth + TollipPMeth + TLR2Meth + TOLLIPexp * TollipPMeth,
##     data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients: (1 not defined because of singularities)
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    -336.2786         NaN      NaN    NaN
## Individu        -0.2029         NaN      NaN    NaN
## NC              0.9108         NaN      NaN    NaN
## Sal             2.7473         NaN      NaN    NaN
## PT             23.1447         NaN      NaN    NaN
## TOLLIPexp       1.8989         NaN      NaN    NaN
## TLR5exp        -0.4276         NaN      NaN    NaN
## TLR7Meth        4.0107         NaN      NaN    NaN
## TollipPMeth     4.2917         NaN      NaN    NaN
## TLR2Meth       -0.4311         NaN      NaN    NaN
## TOLLIPexp:TollipPMeth      NA         NA      NA     NA
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared: 1, Adjusted R-squared: NaN
## F-statistic: NaN on 9 and 0 DF, p-value: NA
```

```
Mod1 <-
lm(RTDM~Individu+Taille+NC+Sal+PT+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth+TLR2
Meth, data=testFinale)
summary(Mod1)
```

```
##
## Call:
## lm(formula = RTDM ~ Individu + Taille + NC + Sal + PT + TOLLIPexp +
##     TLR5exp + TLR7Meth + TollipPMeth + TLR2Meth, data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients: (1 not defined because of singularities)
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -36.48097         NaN      NaN    NaN
## Individu     -0.03319         NaN      NaN    NaN
## Taille       -0.32706         NaN      NaN    NaN
## NC           0.23896         NaN      NaN    NaN
```



```
## Sal      0.77145      NaN      NaN      NaN
## PT       3.99370      NaN      NaN      NaN
## TOLLIPexp 0.82486      NaN      NaN      NaN
## TLR5exp  -0.59284      NaN      NaN      NaN
## TLR7Meth 0.56956      NaN      NaN      NaN
## TollipPMeth 0.68856      NaN      NaN      NaN
## TLR2Meth      NA      NA      NA      NA
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared: 1, Adjusted R-squared: NaN
## F-statistic: NaN on 9 and 0 DF, p-value: NA

Mod11 <-
lm(RTDM~Individu+Taille+NC+Sal+PT+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth,
data=testFinale)
summary(Mod11)

##
## Call:
## lm(formula = RTDM ~ Individu + Taille + NC + Sal + PT + TOLLIPexp +
##     TLR5exp + TLR7Meth + TollipPMeth, data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -36.48097      NaN      NaN      NaN
## Individu    -0.03319      NaN      NaN      NaN
## Taille      -0.32706      NaN      NaN      NaN
## NC           0.23896      NaN      NaN      NaN
## Sal          0.77145      NaN      NaN      NaN
## PT           3.99370      NaN      NaN      NaN
## TOLLIPexp    0.82486      NaN      NaN      NaN
## TLR5exp     -0.59284      NaN      NaN      NaN
## TLR7Meth     0.56956      NaN      NaN      NaN
## TollipPMeth  0.68856      NaN      NaN      NaN
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared: 1, Adjusted R-squared: NaN
## F-statistic: NaN on 9 and 0 DF, p-value: NA

Mod12 <- lm(RTDM~Individu+Taille+NC+Sal+PT+TOLLIPexp+TLR5exp+TLR7Meth,
data=testFinale)
summary(Mod12)

##
## Call:
## lm(formula = RTDM ~ Individu + Taille + NC + Sal + PT + TOLLIPexp +
##     TLR5exp + TLR7Meth, data = testFinale)
##
```

```
## Residuals:
##      1      2      3      4      5      6      7      8
## 0.03393 -0.18565 0.12038 0.20443 -0.26195 -0.01476 0.12685 -0.14322
##      9     10
## 0.10825 0.01174
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -3.73820    60.10758  -0.062   0.960
## Individu    -0.01946     0.02537  -0.767   0.583
## Taille      -0.40765     0.13387  -3.045   0.202
## NC           0.23108     0.34366   0.672   0.623
## Sal          0.76922     0.32795   2.346   0.257
## PT           0.45828    35.23391   0.013   0.992
## TOLLIPexp    0.80549     0.23175   3.476   0.178
## TLR5exp     -0.62491     0.44628  -1.400   0.395
## TLR7Meth     0.26567     0.61361   0.433   0.740
##
## Residual standard error: 0.4574 on 1 degrees of freedom
## Multiple R-squared:  0.9762, Adjusted R-squared:  0.786
## F-statistic: 5.132 on 8 and 1 DF,  p-value: 0.3294

Mod13 <- lm(RTDM~Individu+Taille+NC+Sal+PT+TOLLIPexp+TLR5exp,
data=testFinale)
summary(Mod13)

##
## Call:
## lm(formula = RTDM ~ Individu + Taille + NC + Sal + PT + TOLLIPexp +
##      TLR5exp, data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7      8
## -0.01963 -0.09233 0.06680 0.25344 -0.21760 -0.04607 0.14872 -0.26003
##      9     10
## 0.17742 -0.01073
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 22.19272    3.91395   5.670 0.0297 *
## Individu    -0.02234    0.01887  -1.184 0.3580
## Taille      -0.44617    0.07708  -5.789 0.0286 *
## NC           0.31669    0.21658   1.462 0.2812
## Sal          0.80592    0.24411   3.301 0.0808 .
## PT          10.72458    20.08082   0.534 0.6467
## TOLLIPexp    0.76018    0.15932   4.771 0.0412 *
## TLR5exp     -0.50631    0.27147  -1.865 0.2032
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
## Residual standard error: 0.3524 on 2 degrees of freedom
## Multiple R-squared: 0.9718, Adjusted R-squared: 0.8729
## F-statistic: 9.834 on 7 and 2 DF, p-value: 0.09538

Mod14 <- lm(RTDM~Individu+Taille+NC+Sal+PT+TOLLIPexp, data=testFinale)
summary(Mod14)

##
## Call:
## lm(formula = RTDM ~ Individu + Taille + NC + Sal + PT + TOLLIPexp,
##     data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7      8
## -0.15824  0.21706  0.39451  0.21482 -0.45501 -0.32262 -0.03450 -0.09288
##      9     10
##  0.28801 -0.05115
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  25.64852    4.65889   5.505  0.0118 *
## Individu     -0.05155    0.01421  -3.627  0.0361 *
## Taille       -0.49828    0.09708  -5.133  0.0143 *
## NC           0.54526    0.24131   2.260  0.1090
## Sal          1.06138    0.27306   3.887  0.0302 *
## PT          31.97453   22.34539   1.431  0.2478
## TOLLIPexp    0.70981    0.21218   3.345  0.0442 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.4763 on 3 degrees of freedom
## Multiple R-squared: 0.9227, Adjusted R-squared: 0.768
## F-statistic: 5.965 on 6 and 3 DF, p-value: 0.08561

Mod15 <- lm(RTDM~Individu+Taille+NC+Sal+PT, data=testFinale)
summary(Mod15)

##
## Call:
## lm(formula = RTDM ~ Individu + Taille + NC + Sal + PT, data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7      8
## -0.46485  0.01295  1.40116 -0.17523  0.14273 -0.50102  0.27512 -0.74980
##      9     10
## -0.19133  0.25028
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  18.72159    7.86093   2.382  0.0759 .
## Individu     -0.02824    0.02333  -1.210  0.2928
```

```
## Taille      -0.38254      0.17084   -2.239    0.0887 .
## NC           0.27583      0.42846    0.644    0.5548
## Sal          0.65826      0.46153    1.426    0.2269
## PT          31.82560     42.08867    0.756    0.4916
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.897 on 4 degrees of freedom
## Multiple R-squared:  0.6341, Adjusted R-squared:  0.1768
## F-statistic: 1.387 on 5 and 4 DF,  p-value: 0.3869

Mod16 <- lm(RTDM~Individu+Taille+NC+Sal, data=testFinale)
summary(Mod16)

##
## Call:
## lm(formula = RTDM ~ Individu + Taille + NC + Sal, data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7      8
## -0.35961  0.03012  1.46422 -0.38784  0.04739 -0.19112 -0.09767 -0.99766
##      9     10
##  0.03453  0.45765
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  16.25024     6.83629   2.377  0.0634 .
## Individu     -0.01767     0.01787  -0.989  0.3681
## Taille      -0.31874     0.14205  -2.244  0.0749 .
## NC           0.16798     0.38633   0.435  0.6818
## Sal          0.61394     0.43775   1.403  0.2197
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8578 on 5 degrees of freedom
## Multiple R-squared:  0.5818, Adjusted R-squared:  0.2473
## F-statistic: 1.739 on 4 and 5 DF,  p-value: 0.2775

Mod17 <- lm(RTDM~Individu+Taille+NC, data=testFinale)
summary(Mod17)

##
## Call:
## lm(formula = RTDM ~ Individu + Taille + NC, data = testFinale)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.94172 -0.57230 -0.06453  0.43153  1.44397
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept) 11.078320  6.202984  1.786  0.124
## Individu    -0.007329  0.017541 -0.418  0.691
## Taille      -0.223330  0.134374 -1.662  0.148
## NC          -0.120777  0.352260 -0.343  0.743
##
## Residual standard error: 0.9243 on 6 degrees of freedom
## Multiple R-squared:  0.4173, Adjusted R-squared:  0.126
## F-statistic: 1.433 on 3 and 6 DF,  p-value: 0.3231

Mod18 <- lm(RTDM~Individu+Taille, data=testFinale)
summary(Mod18)

##
## Call:
## lm(formula = RTDM ~ Individu + Taille, data = testFinale)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.98814 -0.63311  0.05841  0.49781  1.36991
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 11.80098    5.45381   2.164  0.0672 .
## Individu    -0.00521    0.01535  -0.340  0.7442
## Taille      -0.24123    0.11575  -2.084  0.0756 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8641 on 7 degrees of freedom
## Multiple R-squared:  0.4059, Adjusted R-squared:  0.2362
## F-statistic: 2.392 on 2 and 7 DF,  p-value: 0.1616

Mod19 <- lm(RTDM~Individu+Taille, data=testFinale)
summary(Mod19)

##
## Call:
## lm(formula = RTDM ~ Individu + Taille, data = testFinale)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.98814 -0.63311  0.05841  0.49781  1.36991
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 11.80098    5.45381   2.164  0.0672 .
## Individu    -0.00521    0.01535  -0.340  0.7442
## Taille      -0.24123    0.11575  -2.084  0.0756 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
## Residual standard error: 0.8641 on 7 degrees of freedom
## Multiple R-squared:  0.4059, Adjusted R-squared:  0.2362
## F-statistic: 2.392 on 2 and 7 DF,  p-value: 0.1616
```

```
AIC(Mod1A)
```

```
## [1] -Inf
```

```
AIC(Mod11A)
```

```
## [1] -Inf
```

```
AIC(Mod12A)
```

```
## [1] -Inf
```

```
AIC(Mod13A)
```

```
## [1] -Inf
```

```
AIC(Mod14A)
```

```
## [1] -Inf
```

```
AIC(Mod15A)
```

```
## [1] -Inf
```

```
AIC(Mod1)
```

```
## [1] -Inf
```

```
AIC(Mod11)
```

```
## [1] -Inf
```

```
AIC(Mod12)
```

```
## [1] 9.707932
```

```
AIC(Mod13)
```

```
## [1] 9.42603
```

```
AIC(Mod14)
```

```
## [1] 17.50284
```

```
AIC(Mod15)
```

```
## [1] 31.04287
```

```
AIC(Mod16)
```

```
## [1] 30.37894
```

```

AIC(Mod17)
## [1] 31.69645
AIC(Mod18)
## [1] 29.89048
AIC(Mod19)
## [1] 29.89048

#best model Mod11
Mod13 <- lm(RTDM~Individu+Taille+NC+Sal+PT+TOLLIPexp+TLR5exp,
data=testFinale)
summary(Mod13)

##
## Call:
## lm(formula = RTDM ~ Individu + Taille + NC + Sal + PT + TOLLIPexp +
##     TLR5exp, data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7      8
## -0.01963 -0.09233  0.06680  0.25344 -0.21760 -0.04607  0.14872 -0.26003
##      9     10
##  0.17742 -0.01073
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  22.19272    3.91395   5.670   0.0297 *
## Individu     -0.02234    0.01887  -1.184   0.3580
## Taille      -0.44617    0.07708  -5.789   0.0286 *
## NC           0.31669    0.21658   1.462   0.2812
## Sal          0.80592    0.24411   3.301   0.0808 .
## PT          10.72458   20.08082   0.534   0.6467
## TOLLIPexp    0.76018    0.15932   4.771   0.0412 *
## TLR5exp     -0.50631    0.27147  -1.865   0.2032
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3524 on 2 degrees of freedom
## Multiple R-squared:  0.9718, Adjusted R-squared:  0.8729
## F-statistic: 9.834 on 7 and 2 DF,  p-value: 0.09538

check_collinearity(Mod13) #enlever individu et TRL5exp

## # Check for Multicollinearity
##
## Low Correlation
##
##      Term  VIF Increased SE Tolerance

```

```

##      Taille 2.73          1.65          0.37
##      NC 3.32           1.82          0.30
##      Sal 3.89          1.97          0.26
##      PT 3.57           1.89          0.28
##  TOLLIPexp 1.80         1.34          0.56
##
## Moderate Correlation
##
##      Term  VIF Increased SE Tolerance
##  Individu 9.30          3.05          0.11
##  TLR5exp 5.22           2.28          0.19

Mod11B <- lm(RTDM~Taille+NC+Sal+PT+TOLLIPexp+TLR7Meth+TLR2Meth,
data=testFinale)
# en rajoutant TLR2Meth on obtient un meilleur AIC et pas de multicollinéarité
summary(Mod11B)

##
## Call:
## lm(formula = RTDM ~ Taille + NC + Sal + PT + TOLLIPexp + TLR7Meth +
##      TLR2Meth, data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7      8
## -0.08310  0.61815  0.07530 -0.17469  0.26107 -0.25559 -0.25291 -0.24390
##      9     10
##  0.13364 -0.07797
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 112.21009   54.17373   2.071   0.174
## Taille      -0.48094    0.13552  -3.549   0.071 .
## NC           0.31987    0.31464   1.017   0.416
## Sal          0.20908    0.33529   0.624   0.597
## PT          32.79668   30.21281   1.086   0.391
## TOLLIPexp    0.23153    0.23377   0.990   0.426
## TLR7Meth     -1.11181    0.55993  -1.986   0.185
## TLR2Meth      0.15818    0.06811   2.322   0.146
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.5942 on 2 degrees of freedom
## Multiple R-squared:  0.9197, Adjusted R-squared:  0.6389
## F-statistic: 3.274 on 7 and 2 DF,  p-value: 0.2538

check_collinearity(Mod11B)

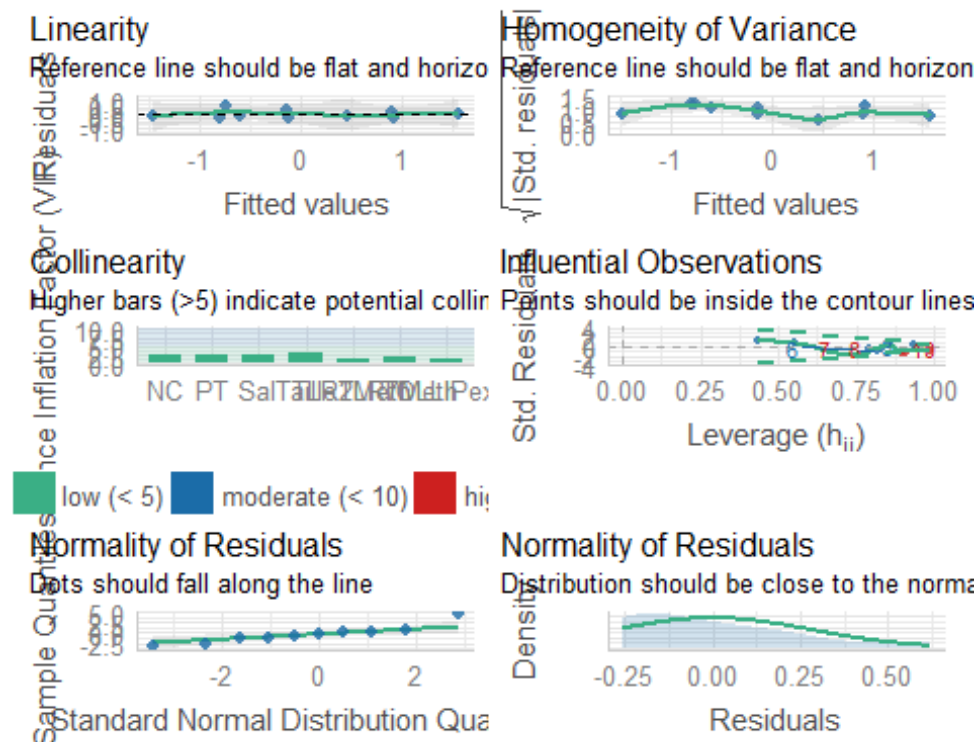
## # Check for Multicollinearity
##
## Low Correlation
##

```



```
##      Term  VIF Increased SE Tolerance
##      Taille 2.97      1.72      0.34
##      NC      2.47      1.57      0.41
##      Sal      2.58      1.61      0.39
##      PT      2.84      1.69      0.35
##  TOLLIPexp  1.36      1.17      0.73
##  TLR7Meth   1.85      1.36      0.54
##  TLR2Meth   1.40      1.18      0.71
```

```
check_model(Mod11B)
```



```
Anova(Mod11B)
```

```
## Anova Table (Type II tests)
```

```
##
```

```
## Response: RTDM
```

```
##      Sum Sq Df F value  Pr(>F)
##  Taille  4.4466  1 12.5953 0.07104 .
##  NC       0.3649  1  1.0335 0.41631
##  Sal      0.1373  1  0.3888 0.59655
##  PT       0.4160  1  1.1784 0.39111
##  TOLLIPexp 0.3463  1  0.9809 0.42636
##  TLR7Meth  1.3919  1  3.9427 0.18547
##  TLR2Meth  1.9039  1  5.3928 0.14591
##  Residuals 0.7061  2
```

```
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

#Pas d'effet sur RTDM en S21

AIC(Mod11B)

[1] 19.87262

#Morsures

Mod2 <-

glm(Bite~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth+TLR2Meth+Tollip
PMeth, data=testFinale, family = "poisson")

summary(Mod2)

##

Call:

glm(formula = Bite ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
TLR5exp + TLR7Meth + TLR2Meth + TollipPMeth, family = "poisson",
data = testFinale)

##

Deviance Residuals:

[1] 0 0 0 0 0 0 0 0 0 0

##

Coefficients: (1 not defined because of singularities)

Estimate Std. Error z value Pr(>|z|)

(Intercept) 12.112752 11.836841 1.023 0.306162

Individu 0.002433 0.006994 0.348 0.727909

NC -0.266527 0.074698 -3.568 0.000360 ***

Sal 0.208791 0.124500 1.677 0.093536 .

PT -29.051074 8.339128 -3.484 0.000495 ***

Taille -0.203398 0.034868 -5.833 5.43e-09 ***

TOLLIPexp 0.213543 0.064979 3.286 0.001015 **

TLR5exp -0.614156 0.082542 -7.440 1.00e-13 ***

TLR7Meth 0.009888 0.128225 0.077 0.938535

TLR2Meth 0.035215 0.018752 1.878 0.060390 .

TollipPMeth NA NA NA NA

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

##

(Dispersion parameter for poisson family taken to be 1)

##

Null deviance: 7.9890e+02 on 9 degrees of freedom

Residual deviance: 3.9968e-15 on 0 degrees of freedom

AIC: 87.084

##

Number of Fisher Scoring iterations: 2

Mod21 <-

glm(Bite~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth,

```

data=testFinale, family = "poisson")
summary(Mod21)

##
## Call:
## glm(formula = Bite ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp + TLR7Meth + TollipPMeth, family = "poisson", data =
testFinale)
##
## Deviance Residuals:
## [1] 0 0 0 0 0 0 0 0 0 0
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) -12.375738  16.541917  -0.748 0.454373
## Individu    -0.011427   0.005262  -2.172 0.029883 *
## NC          -0.211650   0.061991  -3.414 0.000640 ***
## Sal         0.370182   0.064136   5.772 7.84e-09 ***
## PT         -27.486755   8.164396  -3.367 0.000761 ***
## Taille     -0.176683   0.044661  -3.956 7.62e-05 ***
## TOLLIPexp   0.301272   0.045806   6.577 4.80e-11 ***
## TLR5exp    -0.600661   0.081580  -7.363 1.80e-13 ***
## TLR7Meth    0.290975   0.161332   1.804 0.071296 .
## TollipPMeth 0.294313   0.156722   1.878 0.060390 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for poisson family taken to be 1)
##
##      Null deviance: 7.9890e+02 on 9 degrees of freedom
## Residual deviance: -6.6169e-14 on 0 degrees of freedom
## AIC: 87.084
##
## Number of Fisher Scoring iterations: 2

Mod22 <- glm(Bite~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth,
data=testFinale, family = "poisson")
summary(Mod22)

##
## Call:
## glm(formula = Bite ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp + TLR7Meth, family = "poisson", data = testFinale)
##
## Deviance Residuals:
##          1          2          3          4          5          6          7
## 0.06700 -0.50424  0.25964  1.32168 -0.93210 -0.06799  0.30636 -
0.57952
##          9         10
## 0.26118  0.07188

```

```
##
## Coefficients:
##      Estimate Std. Error z value Pr(>|z|)
## (Intercept)  10.033375  11.600108   0.865  0.38707
## Individu    -0.007344   0.004708  -1.560  0.11879
## NC          -0.183331   0.059208  -3.096  0.00196 **
## Sal          0.415962   0.059319   7.012 2.34e-12 ***
## PT         -24.550787   8.100597  -3.031  0.00244 **
## Taille     -0.243780   0.028861  -8.447 < 2e-16 ***
## TOLLIPexp    0.300831   0.044929   6.696 2.15e-11 ***
## TLR5exp     -0.585910   0.080628  -7.267 3.68e-13 ***
## TLR7Meth     0.085368   0.118898   0.718  0.47276
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for poisson family taken to be 1)
##
##      Null deviance: 798.9030  on 9  degrees of freedom
## Residual deviance:   3.4495  on 1  degrees of freedom
## AIC: 88.533
##
## Number of Fisher Scoring iterations: 4

Mod23 <- glm(Bite~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp,
data=testFinale, family = "poisson")
summary(Mod23)

##
## Call:
## glm(formula = Bite ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp, family = "poisson", data = testFinale)
##
## Deviance Residuals:
##      1      2      3      4      5      6      7
## -0.05623 -0.16133  0.09820  1.48967 -0.63633 -0.21248  0.32003
##  0.99195
##      9     10
##  0.40523 -0.08570
##
## Coefficients:
##      Estimate Std. Error z value Pr(>|z|)
## (Intercept)  18.329470   1.137306  16.117 < 2e-16 ***
## Individu    -0.007701   0.004657  -1.654 0.098199 .
## NC          -0.163288   0.052616  -3.103 0.001913 **
## Sal          0.421945   0.058993   7.152 8.53e-13 ***
## PT         -20.859063   6.222692  -3.352 0.000802 ***
## Taille     -0.256413   0.022989 -11.154 < 2e-16 ***
## TOLLIPexp    0.282920   0.036948   7.657 1.90e-14 ***
## TLR5exp     -0.551066   0.064426  -8.553 < 2e-16 ***
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for poisson family taken to be 1)
##
##      Null deviance: 798.903  on 9  degrees of freedom
## Residual deviance:  3.966  on 2  degrees of freedom
## AIC: 87.05
##
## Number of Fisher Scoring iterations: 4

Mod24 <- glm(Bite~Individu+NC+Sal+PT+Taille+TOLLIPexp, data=testFinale,
family = "poisson")
summary(Mod24)

##
## Call:
## glm(formula = Bite ~ Individu + NC + Sal + PT + Taille + TOLLIPexp,
##      family = "poisson", data = testFinale)
##
## Deviance Residuals:
##      1       2       3       4       5       6       7       8       9
##    -1.300    3.982    3.405    1.197   -4.148   -4.957   -1.403    1.395    1.903   -
##    1.191
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) 23.029173   1.038291  22.180 < 2e-16 ***
## Individu    -0.042097   0.002649 -15.889 < 2e-16 ***
## NC           0.157089   0.037625  4.175 2.98e-05 ***
## Sal          0.681081   0.051897 13.124 < 2e-16 ***
## PT          12.548995   4.570711  2.746 0.00604 **
## Taille      -0.336954   0.021631 -15.577 < 2e-16 ***
## TOLLIPexp    0.291938   0.038442  7.594 3.10e-14 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for poisson family taken to be 1)
##
##      Null deviance: 798.903  on 9  degrees of freedom
## Residual deviance: 81.303  on 3  degrees of freedom
## AIC: 162.39
##
## Number of Fisher Scoring iterations: 4

Mod25 <- glm(Bite~Individu+NC+Sal+PT+Taille, data=testFinale, family =
"poisson")
summary(Mod25)
```

```
##
## Call:
## glm(formula = Bite ~ Individu + NC + Sal + PT + Taille, family =
"poisson",
## data = testFinale)
##
## Deviance Residuals:
##      1      2      3      4      5      6      7      8
## -2.1879  2.9563  8.2816 -1.3300 -2.7742 -6.2937 -0.3800 -2.3244
##      9     10
##  0.4978  1.4837
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) 19.87015    0.94972  20.922  <2e-16 ***
## Individu    -0.02785    0.00166 -16.775  <2e-16 ***
## NC           0.09244    0.03917   2.360   0.0183 *
## Sal          0.43947    0.03810  11.533  <2e-16 ***
## PT          -0.66899    4.16115  -0.161   0.8723
## Taille     -0.27783    0.01972 -14.089  <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for poisson family taken to be 1)
##
## Null deviance: 798.90 on 9 degrees of freedom
## Residual deviance: 139.18 on 4 degrees of freedom
## AIC: 218.27
##
## Number of Fisher Scoring iterations: 5

Mod26 <- glm(Bite~Individu+NC+Sal+PT, data=testFinale, family = "poisson")
summary(Mod26)

##
## Call:
## glm(formula = Bite ~ Individu + NC + Sal + PT, family = "poisson",
## data = testFinale)
##
## Deviance Residuals:
##      1      2      3      4      5      6      7      8
## -1.8119 -0.6186 11.4281 -8.0806 -3.4453 -2.3046 -0.6386 -4.6280
##      9     10
##  9.8475 -5.6832
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)  6.968961   0.109654  63.554  < 2e-16 ***
## Individu    -0.017499   0.001443 -12.127  < 2e-16 ***
## NC          -0.248165   0.028718  -8.642  < 2e-16 ***
```

```
## Sal          0.206529    0.038870    5.313 1.08e-07 ***
## PT           -22.766285    3.473681   -6.554 5.60e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for poisson family taken to be 1)
##
##      Null deviance: 798.90  on 9  degrees of freedom
## Residual deviance: 367.84  on 5  degrees of freedom
## AIC: 444.93
##
## Number of Fisher Scoring iterations: 5

Mod27 <- glm(Bite~Individu+NC+Sal, data=testFinale, family = "poisson")
summary(Mod27)

##
## Call:
## glm(formula = Bite ~ Individu + NC + Sal, family = "poisson",
##      data = testFinale)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -9.162  -4.195  -2.276   1.803  11.533
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)  6.445746   0.070547  91.368 < 2e-16 ***
## Individu    -0.022811   0.001222 -18.674 < 2e-16 ***
## NC          -0.271933   0.030083  -9.039 < 2e-16 ***
## Sal         0.144824   0.035175   4.117 3.83e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for poisson family taken to be 1)
##
##      Null deviance: 798.90  on 9  degrees of freedom
## Residual deviance: 412.45  on 6  degrees of freedom
## AIC: 487.53
##
## Number of Fisher Scoring iterations: 5

Mod28 <- glm(Bite~Individu+NC, data=testFinale, family = "poisson")
summary(Mod28)

##
## Call:
## glm(formula = Bite ~ Individu + NC, family = "poisson", data = testFinale)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
```

```

## -7.848 -6.137 -1.768 1.438 10.905
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept)  6.353451  0.069352  91.61  <2e-16 ***
## Individu    -0.021293  0.001205 -17.66  <2e-16 ***
## NC          -0.318900  0.027663 -11.53  <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for poisson family taken to be 1)
##
##      Null deviance: 798.90  on 9  degrees of freedom
## Residual deviance: 429.72  on 7  degrees of freedom
## AIC: 502.8
##
## Number of Fisher Scoring iterations: 5

Mod29 <- glm(Bite~Individu, data=testFinale, family = "poisson")
summary(Mod29)

##
## Call:
## glm(formula = Bite ~ Individu, family = "poisson", data = testFinale)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -12.994   -5.486   -2.262    6.031   10.725
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept)  6.297038  0.074069  85.02  <2e-16 ***
## Individu    -0.019853  0.001288 -15.42  <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for poisson family taken to be 1)
##
##      Null deviance: 798.90  on 9  degrees of freedom
## Residual deviance: 566.35  on 8  degrees of freedom
## AIC: 637.43
##
## Number of Fisher Scoring iterations: 5

AIC(Mod2)

## [1] 87.08357

AIC(Mod21)

## [1] 87.08357

```



```

AIC(Mod22)
## [1] 88.53308
AIC(Mod23)
## [1] 87.04953
AIC(Mod24)
## [1] 162.3866
AIC(Mod25)
## [1] 218.2677
AIC(Mod26)
## [1] 444.9251
AIC(Mod27)
## [1] 487.5297
AIC(Mod28)
## [1] 502.8006
AIC(Mod29)
## [1] 637.4303

#Bestmodel Mod2 car 24A problème multicollinéarité
Mod2 <-
glm(Bite~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth+TLR2Meth+Tollip
PMeth, data=testFinale, family = "poisson")
summary(Mod2)

##
## Call:
## glm(formula = Bite ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp + TLR7Meth + TLR2Meth + TollipPMeth, family = "poisson",
##      data = testFinale)
##
## Deviance Residuals:
## [1] 0 0 0 0 0 0 0 0 0 0
##
## Coefficients: (1 not defined because of singularities)
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)  12.112752  11.836841   1.023 0.306162
## Individu      0.002433   0.006994   0.348 0.727909
## NC           -0.266527   0.074698  -3.568 0.000360 ***
## Sal           0.208791   0.124500   1.677 0.093536 .
## PT          -29.051074   8.339128  -3.484 0.000495 ***

```

```
## Taille      -0.203398    0.034868   -5.833 5.43e-09 ***
## TOLLIPexp    0.213543    0.064979    3.286 0.001015 **
## TLR5exp     -0.614156    0.082542   -7.440 1.00e-13 ***
## TLR7Meth     0.009888    0.128225    0.077 0.938535
## TLR2Meth     0.035215    0.018752    1.878 0.060390 .
## TollipPMeth      NA          NA          NA          NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for poisson family taken to be 1)
##
##      Null deviance: 7.9890e+02  on 9  degrees of freedom
## Residual deviance: 3.9968e-15  on 0  degrees of freedom
## AIC: 87.084
##
## Number of Fisher Scoring iterations: 2

check_collinearity(Mod2) #=> enlever individu; TLR5 exp et Taille

## Warning: Model matrix is rank deficient. VIFs may not be sensible.

## # Check for Multicollinearity
##
## Moderate Correlation
##
##      Term  VIF Increased SE Tolerance
##      NC 6.61      2.57      0.15
##      PT 6.39      2.53      0.16
##      Taille 5.71      2.39      0.18
##      TOLLIPexp 7.72      2.78      0.13
##      TLR7Meth 7.88      2.81      0.13
##      TLR2Meth 5.17      2.27      0.19
##
## High Correlation
##
##      Term  VIF Increased SE Tolerance
##      Individu 31.55      5.62      0.03
##      Sal 13.33      3.65      0.08
##      TLR5exp 13.73      3.71      0.07

Mod23B <- glm(Bite~NC+Sal+PT+TOLLIPexp+TLR7Meth+TLR2Meth+TollipPMeth,
data=testFinale, family = "poisson")
summary(Mod23B)

##
## Call:
## glm(formula = Bite ~ NC + Sal + PT + TOLLIPexp + TLR7Meth + TLR2Meth +
##      TollipPMeth, family = "poisson", data = testFinale)
##
## Deviance Residuals:
##      1      2      3      4      5      6      7      8      9
```

```

10
## -1.080    6.214    4.728   -9.572    4.020   -2.947   -3.232   -1.829    4.514   -
4.621
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) 36.79352    5.32761   6.906 4.98e-12 ***
## NC          -0.28837    0.03366  -8.566 < 2e-16 ***
## Sal         -0.29748    0.05225  -5.693 1.25e-08 ***
## PT          -6.77627    4.16434  -1.627  0.104
## TOLLIPexp   -0.25139    0.03077  -8.170 3.08e-16 ***
## TLR7Meth    -0.45018    0.05903  -7.627 2.41e-14 ***
## TLR2Meth     0.11452    0.01011  11.330 < 2e-16 ***
## TollipPMeth  0.59472    0.08688   6.845 7.63e-12 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for poisson family taken to be 1)
##
##      Null deviance: 798.90  on 9  degrees of freedom
## Residual deviance: 234.12  on 2  degrees of freedom
## AIC: 317.21
##
## Number of Fisher Scoring iterations: 5

check_collinearity(Mod23B) #ok

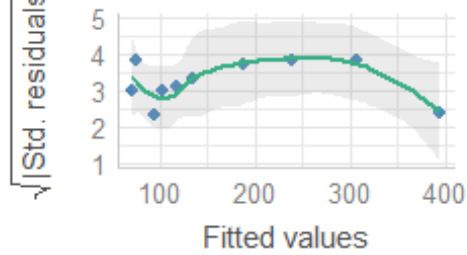
## # Check for Multicollinearity
##
## Low Correlation
##
##      Term  VIF Increased SE Tolerance
##      NC 1.73      1.32      0.58
##      Sal 2.57      1.60      0.39
##      PT 2.15      1.46      0.47
## TOLLIPexp 1.77      1.33      0.56
## TLR7Meth 1.50      1.22      0.67
## TLR2Meth 1.43      1.19      0.70
## TollipPMeth 1.92      1.39      0.52

check_model(Mod23B)

```

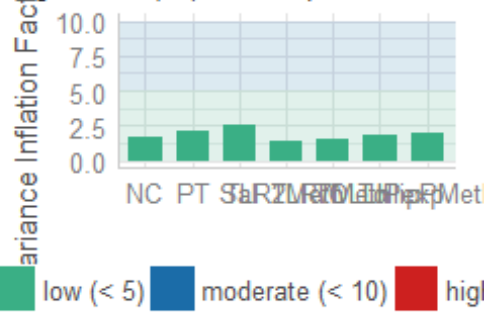
Homogeneity of Variance

Reference line should be flat and horizontal



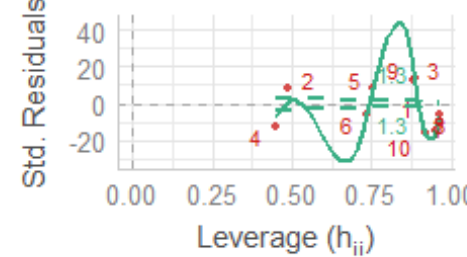
Collinearity

Higher bars (>5) indicate potential collinearity



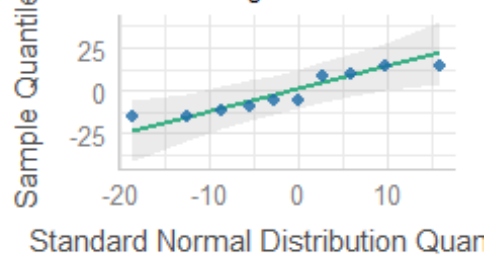
Influential Observations

Points should be inside the contour line



Normality of Residuals

Dots should fall along the line



Anova(Mod23B)

```
## Analysis of Deviance Table (Type II tests)
```

```
##
```

```
## Response: Bite
```

```
##          LR Chisq Df Pr(>Chisq)
```

```
## NC          75.016  1 < 2.2e-16 ***
```

```
## Sal          32.161  1  1.419e-08 ***
```

```
## PT           2.628  1    0.105
```

```
## TOLLIPexp    69.711  1 < 2.2e-16 ***
```

```
## TLR7Meth     58.354  1  2.190e-14 ***
```

```
## TLR2Meth    164.177  1 < 2.2e-16 ***
```

```
## TollipPMeth  49.255  1  2.248e-12 ***
```

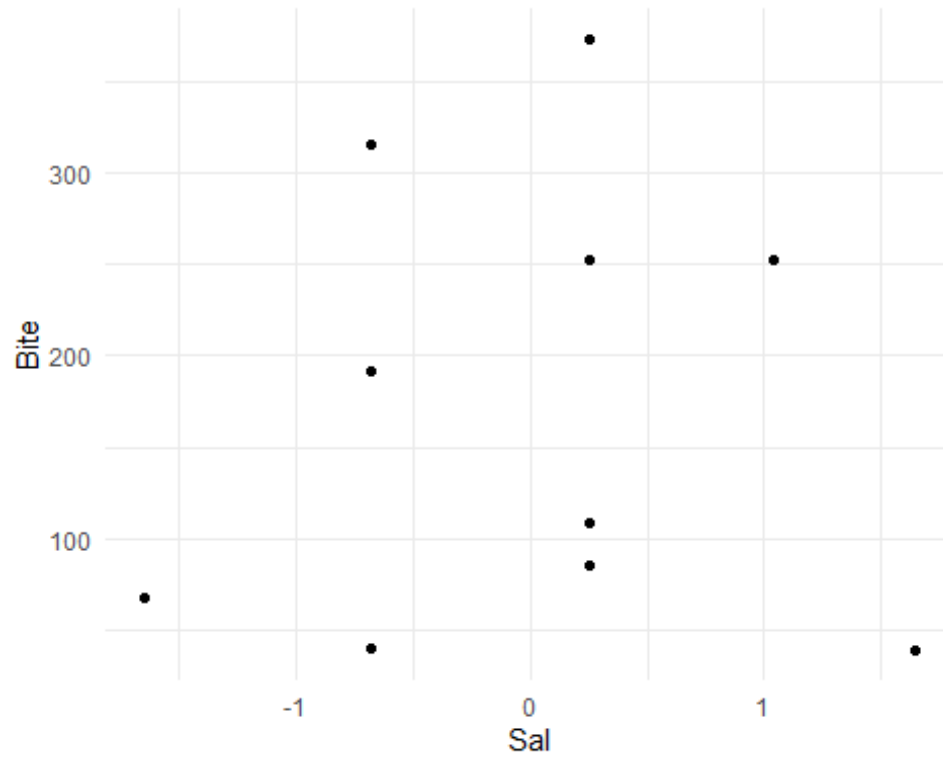
```
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

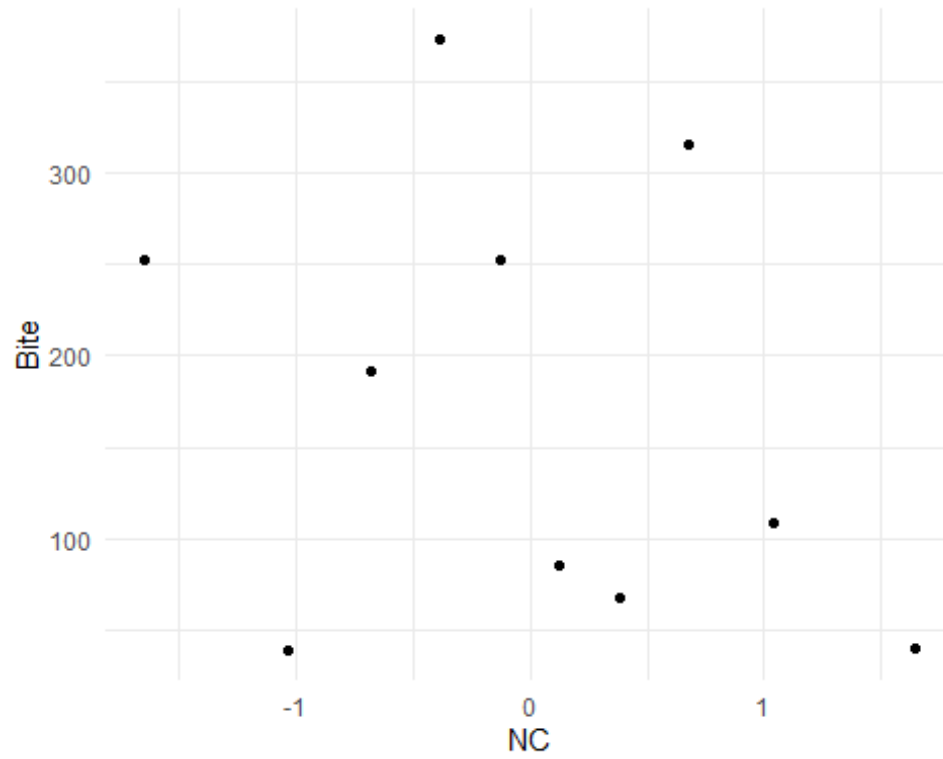
AIC(Mod23B)

```
## [1] 317.2068
```

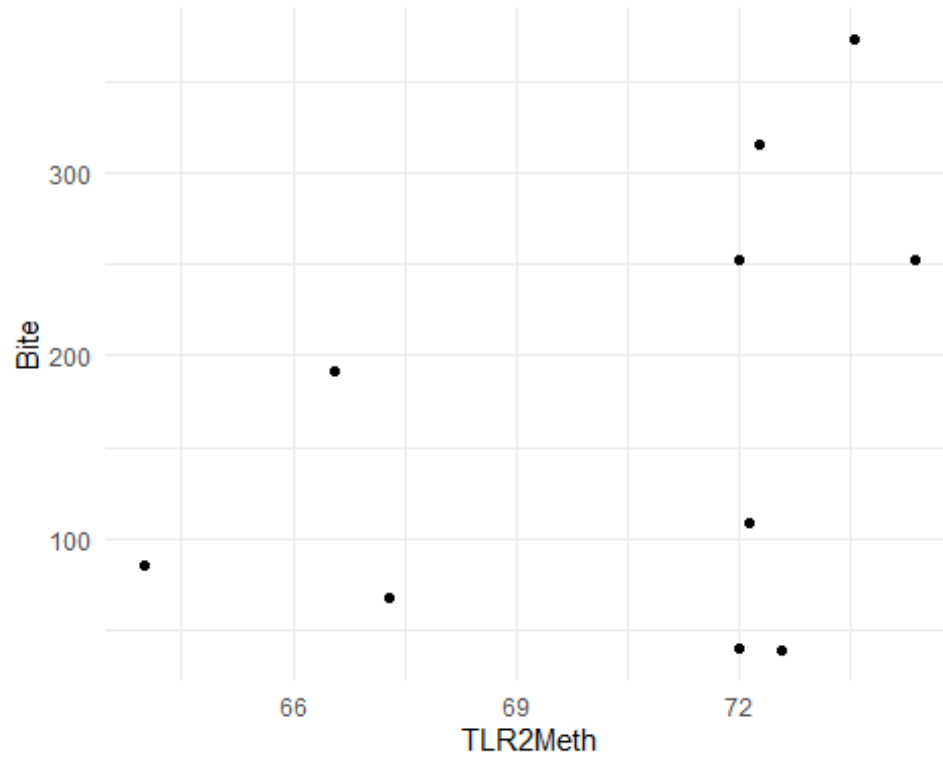
```
ggplot(testFinale) +
  aes(x = Sal, y = Bite) +
  geom_point(shape = "circle", fill = "red") +
  theme_minimal()
```



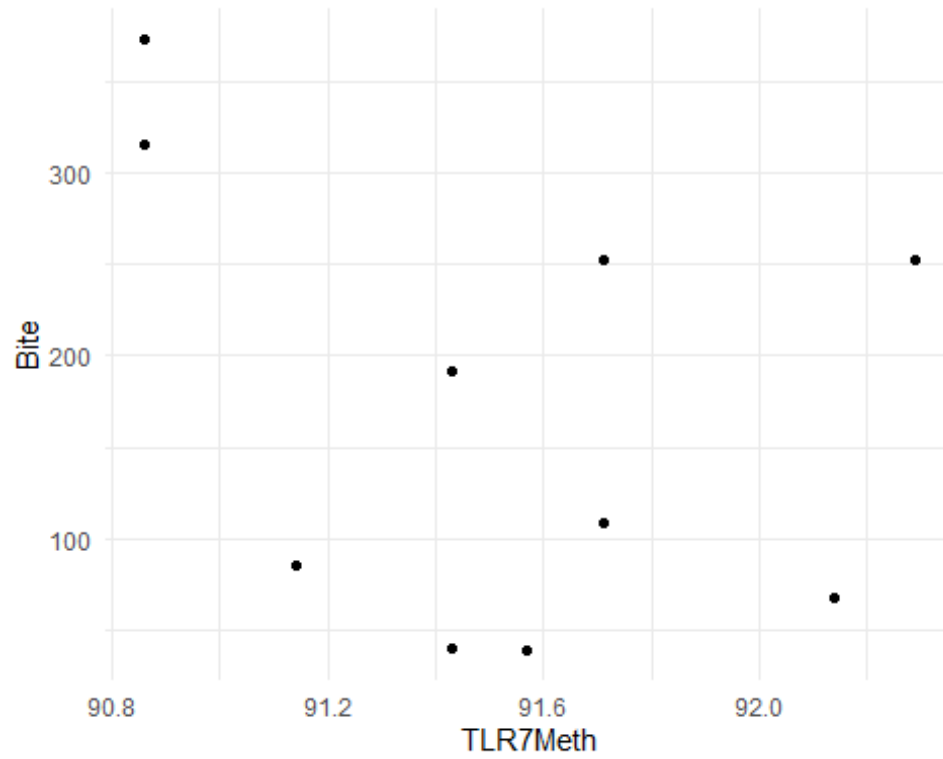
```
ggplot(testFinale) +  
  aes(x = NC, y = Bite) +  
  geom_point(shape = "circle", fill = "red") +  
  theme_minimal()
```



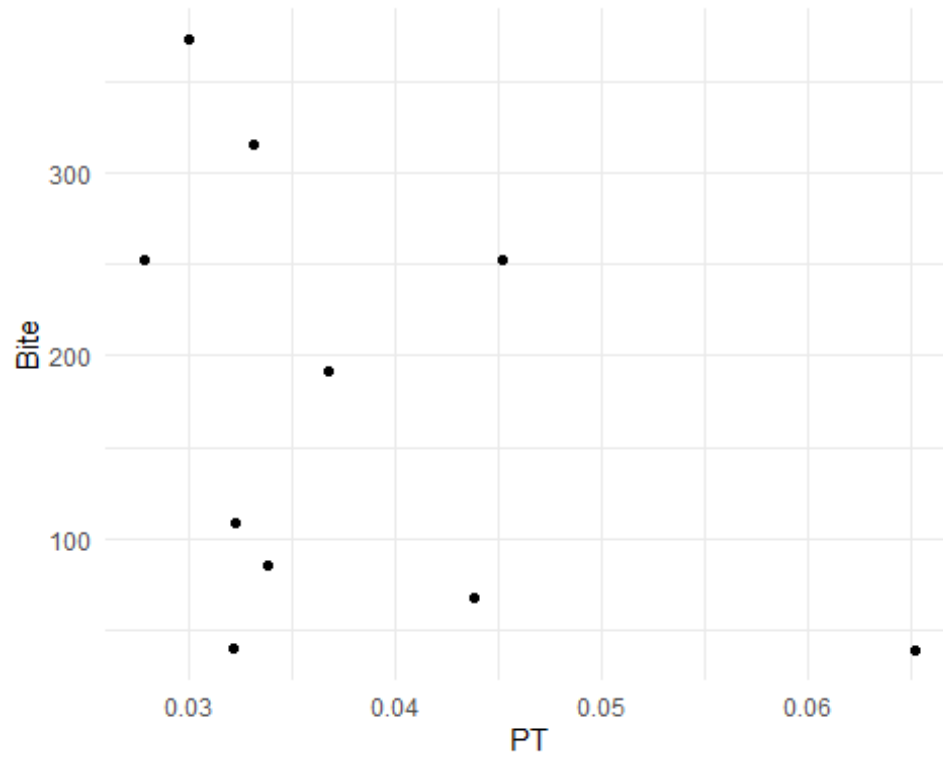
```
ggplot(testFinale) +  
  aes(x = TLR2Meth, y = Bite) +  
  geom_point(shape = "circle", fill = "red") +  
  theme_minimal()
```



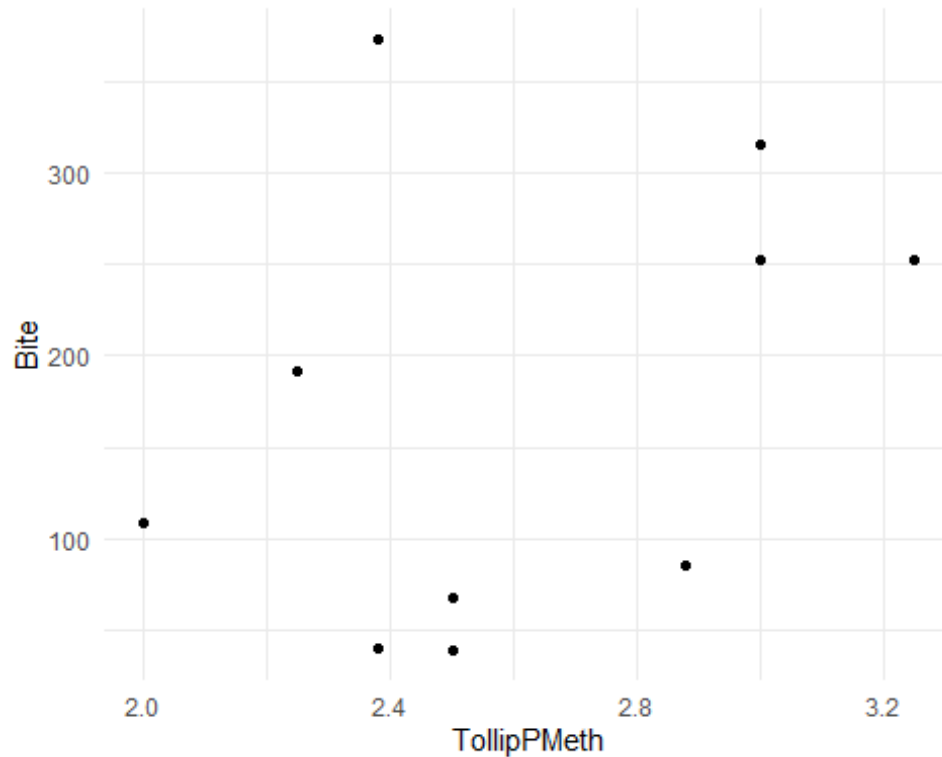
```
ggplot(testFinale) +  
  aes(x = TLR7Meth, y = Bite) +  
  geom_point(shape = "circle", fill = "red") +  
  theme_minimal()
```



```
ggplot(testFinale) +  
  aes(x = PT, y = Bite) +  
  geom_point(shape = "circle", fill = "red") +  
  theme_minimal()
```

```
ggplot(testFinale) +  
  aes(x = TollipPMeth, y = Bite) +  
  geom_point(shape = "circle", fill = "red") +  
  theme_minimal()
```



#rien de particulièrement intéressant graphiquement (petit N)

#effet de chacune des variables sauf Tollipexp

#PZeloign

```
Mod3 <-
lm(PZeloign~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth+
TLR2Meth, data=testFinale)
summary(Mod3)
```

```
##
## Call:
## lm(formula = PZeloign ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##     TLR5exp + TLR7Meth + TollipPMeth + TLR2Meth, data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients: (1 not defined because of singularities)
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -2.097e+01      NaN      NaN      NaN
## Individu      7.627e-03      NaN      NaN      NaN
## NC           -8.451e-02      NaN      NaN      NaN
## Sal          -7.224e-04      NaN      NaN      NaN
## PT           -9.263e+00      NaN      NaN      NaN
## Taille       -8.795e-03      NaN      NaN      NaN
```

```
## TOLLIPexp 1.325e-01      NaN      NaN      NaN
## TLR5exp   -2.596e-01      NaN      NaN      NaN
## TLR7Meth  2.383e-01      NaN      NaN      NaN
## TollipPMeth -1.185e-01      NaN      NaN      NaN
## TLR2Meth           NA      NA      NA      NA
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared:      1, Adjusted R-squared:      NaN
## F-statistic:      NaN on 9 and 0 DF, p-value: NA

Mod31 <-
lm(PZeloign~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth,
data=testFinale)
summary(Mod31)

##
## Call:
## lm(formula = PZeloign ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp + TLR7Meth + TollipPMeth, data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -2.097e+01      NaN      NaN      NaN
## Individu     7.627e-03      NaN      NaN      NaN
## NC           -8.451e-02      NaN      NaN      NaN
## Sal          -7.224e-04      NaN      NaN      NaN
## PT           -9.263e+00      NaN      NaN      NaN
## Taille       -8.795e-03      NaN      NaN      NaN
## TOLLIPexp    1.325e-01      NaN      NaN      NaN
## TLR5exp      -2.596e-01      NaN      NaN      NaN
## TLR7Meth     2.383e-01      NaN      NaN      NaN
## TollipPMeth -1.185e-01      NaN      NaN      NaN
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared:      1, Adjusted R-squared:      NaN
## F-statistic:      NaN on 9 and 0 DF, p-value: NA

Mod32 <- lm(PZeloign~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth,
data=testFinale)
summary(Mod32)

##
## Call:
## lm(formula = PZeloign ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp + TLR7Meth, data = testFinale)
##
## Residuals:
##              1              2              3              4              5              6              7
```

```

8
## -0.005842  0.031961 -0.020725 -0.035194  0.045097  0.002541 -0.021838
0.024656
##          9          10
## -0.018635 -0.002021
##
## Coefficients:
##          Estimate Std. Error t value Pr(>|t|)
## (Intercept) -2.660e+01  1.035e+01  -2.571    0.236
## Individu     5.263e-03  4.368e-03   1.205    0.441
## NC          -8.315e-02  5.916e-02  -1.405    0.394
## Sal         -3.387e-04  5.646e-02  -0.006    0.996
## PT          -8.655e+00  6.066e+00  -1.427    0.389
## Taille      5.080e-03  2.305e-02   0.220    0.862
## TOLLIPexp    1.358e-01  3.990e-02   3.404    0.182
## TLR5exp     -2.541e-01  7.683e-02  -3.307    0.187
## TLR7Meth     2.906e-01  1.056e-01   2.751    0.222
##
## Residual standard error: 0.07874 on 1 degrees of freedom
## Multiple R-squared:  0.9614, Adjusted R-squared:  0.6522
## F-statistic:  3.11 on 8 and 1 DF,  p-value: 0.4138

Mod33 <- lm(PZeloign~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp,
data=testFinale)
summary(Mod33)

##
## Call:
## lm(formula = PZeloign ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp, data = testFinale)
##
## Residuals:
##          1          2          3          4          5          6          7          8
## -0.06443  0.13405 -0.07934  0.01842  0.09361 -0.03171  0.00209 -0.10313
##          9         10
##  0.05704 -0.02660
##
## Coefficients:
##          Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.763832   1.810023   0.974    0.433
## Individu     0.002115   0.008724   0.242    0.831
## NC          0.010497   0.100157   0.105    0.926
## Sal         0.039808   0.112889   0.353    0.758
## PT          2.575949   9.286459   0.277    0.808
## Taille     -0.037058   0.035645  -1.040    0.408
## TOLLIPexp    0.086246   0.073678   1.171    0.362
## TLR5exp     -0.124311   0.125542  -0.990    0.426
##
## Residual standard error: 0.163 on 2 degrees of freedom

```

```
## Multiple R-squared:  0.6689, Adjusted R-squared:  -0.49
## F-statistic: 0.5772 on 7 and 2 DF,  p-value: 0.7552

Mod34 <- lm(PZeloign~Individu+NC+Sal+PT+Taille+TOLLIPexp, data=testFinale)
summary(Mod34)

##
## Call:
## lm(formula = PZeloign ~ Individu + NC + Sal + PT + Taille + TOLLIPexp,
##     data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7
##  -0.098463  0.210013  0.001125  0.008936  0.035322 -0.099612 -0.042896 -
##  0.062094
##      9     10
##   0.084191 -0.036522
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   2.612315   1.589150   1.644   0.199
## Individu     -0.005057   0.004848  -1.043   0.374
## NC            0.066616   0.082311   0.809   0.478
## Sal           0.102529   0.093140   1.101   0.351
## PT            7.793330   7.622020   1.022   0.382
## Taille       -0.049852   0.033113  -1.506   0.229
## TOLLIPexp     0.073880   0.072375   1.021   0.382
##
## Residual standard error: 0.1624 on 3 degrees of freedom
## Multiple R-squared:  0.5066, Adjusted R-squared:  -0.4803
## F-statistic: 0.5133 on 6 and 3 DF,  p-value: 0.7768

Mod35 <- lm(PZeloign~Individu+NC+Sal+PT+Taille, data=testFinale)
summary(Mod35)

##
## Call:
## lm(formula = PZeloign ~ Individu + NC + Sal + PT + Taille, data =
## testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7
## -0.130376  0.188768  0.105901 -0.031661  0.097538 -0.118181 -0.010670 -
##  0.130469
##      9     10
##   0.034300 -0.005148
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
```

```
## (Intercept)  1.891335    1.431025    1.322    0.257
## Individu    -0.002631    0.004248   -0.619    0.569
## NC           0.038573    0.077998    0.495    0.647
## Sal          0.060572    0.084017    0.721    0.511
## PT           7.777829    7.661930    1.015    0.367
## Taille      -0.037805    0.031101   -1.216    0.291
##
## Residual standard error: 0.1633 on 4 degrees of freedom
## Multiple R-squared:  0.3352, Adjusted R-squared:  -0.4959
## F-statistic: 0.4033 on 5 and 4 DF,  p-value: 0.8269

Mod36 <- lm(PZeloign~Individu+NC+Sal+PT, data=testFinale)
summary(Mod36)

##
## Call:
## lm(formula = PZeloign ~ Individu + NC + Sal + PT, data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7      8
## -0.12305  0.14775  0.14004 -0.13331  0.11230 -0.06092 -0.02867 -0.14673
##      9     10
##  0.16620 -0.07362
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.177254   0.255199   0.695   0.518
## Individu    -0.001162   0.004262  -0.273   0.796
## NC          -0.019294   0.064669  -0.298   0.777
## Sal         0.011982   0.077348   0.155   0.883
## PT          3.177891   6.973168   0.456   0.668
##
## Residual standard error: 0.1709 on 5 degrees of freedom
## Multiple R-squared:  0.08957, Adjusted R-squared:  -0.6388
## F-statistic: 0.123 on 4 and 5 DF,  p-value: 0.968

Mod37 <- lm(PZeloign~Individu+NC+Sal, data=testFinale)
summary(Mod37)

##
## Call:
## lm(formula = PZeloign ~ Individu + NC + Sal, data = testFinale)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.17584 -0.10156 -0.03186  0.12968  0.16663
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  2.329e-01  2.088e-01   1.116   0.307
## Individu    -9.464e-05  3.317e-03  -0.029   0.978
```

```
## NC          -2.064e-02  6.019e-02  -0.343    0.743
## Sal          1.696e-02  7.134e-02   0.238    0.820
##
## Residual standard error: 0.1592 on 6 degrees of freedom
## Multiple R-squared:  0.05175,    Adjusted R-squared:  -0.4224
## F-statistic: 0.1092 on 3 and 6 DF,  p-value: 0.9516

Mod38 <-lm(PZeloign~Individu+NC, data=testFinale)
summary(Mod38)

##
## Call:
## lm(formula = PZeloign ~ Individu + NC, data = testFinale)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.17618 -0.09134 -0.03945  0.12952  0.17749
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.2098761  0.1719789   1.220   0.262
## Individu     0.0002832  0.0027083   0.105   0.920
## NC          -0.0259319  0.0520128  -0.499   0.633
##
## Residual standard error: 0.1481 on 7 degrees of freedom
## Multiple R-squared:  0.04282,    Adjusted R-squared:  -0.2307
## F-statistic: 0.1566 on 2 and 7 DF,  p-value: 0.858

Mod39 <-lm(PZeloign~Individu, data=testFinale)
summary(Mod39)

##
## Call:
## lm(formula = PZeloign ~ Individu, data = testFinale)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.18468 -0.06987 -0.02412  0.11302  0.17474
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.1867989  0.1576623   1.185   0.270
## Individu     0.0006609  0.0024751   0.267   0.796
##
## Residual standard error: 0.141 on 8 degrees of freedom
## Multiple R-squared:  0.008834,    Adjusted R-squared:  -0.1151
## F-statistic: 0.0713 on 1 and 8 DF,  p-value: 0.7962

AIC(Mod3)

## [1] -Inf
```

```

AIC(Mod31)
## [1] -Inf
AIC(Mod32)
## [1] -25.47886
AIC(Mod33)
## [1] -5.998127
AIC(Mod34)
## [1] -4.00873
AIC(Mod35)
## [1] -3.02742
AIC(Mod36)
## [1] -1.883658
AIC(Mod37)
## [1] -3.476672
AIC(Mod38)
## [1] -5.382928
AIC(Mod39)
## [1] -7.033986

#Bestmodel
Mod32 <- lm(PZeloign~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth,
data=testFinale)
summary(Mod32)

##
## Call:
## lm(formula = PZeloign ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##     TLR5exp + TLR7Meth, data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7
## -0.005842  0.031961 -0.020725 -0.035194  0.045097  0.002541 -0.021838
##  0.024656
##      9     10
## -0.018635 -0.002021
##

```



```
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -2.660e+01 1.035e+01 -2.571  0.236
## Individu    5.263e-03 4.368e-03  1.205  0.441
## NC          -8.315e-02 5.916e-02 -1.405  0.394
## Sal         -3.387e-04 5.646e-02 -0.006  0.996
## PT          -8.655e+00 6.066e+00 -1.427  0.389
## Taille      5.080e-03 2.305e-02  0.220  0.862
## TOLLIPexp    1.358e-01 3.990e-02  3.404  0.182
## TLR5exp     -2.541e-01 7.683e-02 -3.307  0.187
## TLR7Meth     2.906e-01 1.056e-01  2.751  0.222
##
## Residual standard error: 0.07874 on 1 degrees of freedom
## Multiple R-squared:  0.9614, Adjusted R-squared:  0.6522
## F-statistic: 3.11 on 8 and 1 DF, p-value: 0.4138

check_collinearity(Mod32) #=> enlever individu et voir

## # Check for Multicollinearity
##
## Moderate Correlation
##
##      Term  VIF Increased SE Tolerance
## TOLLIPexp 7.31          2.70      0.14
##
## High Correlation
##
##      Term  VIF Increased SE Tolerance
## Individu 14.29          3.78      0.07
## NC       67.73          8.23      0.01
## Sal      23.63          4.86      0.04
## PT       52.81          7.27      0.02
## Taille  325.62         18.04      0.00
## TLR5exp  32.03          5.66      0.03
## TLR7Meth 55.48          7.45      0.02

Mod32B <- lm(PZeloign~NC+Sal+PT+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth,
data=testFinale)
summary(Mod32B)

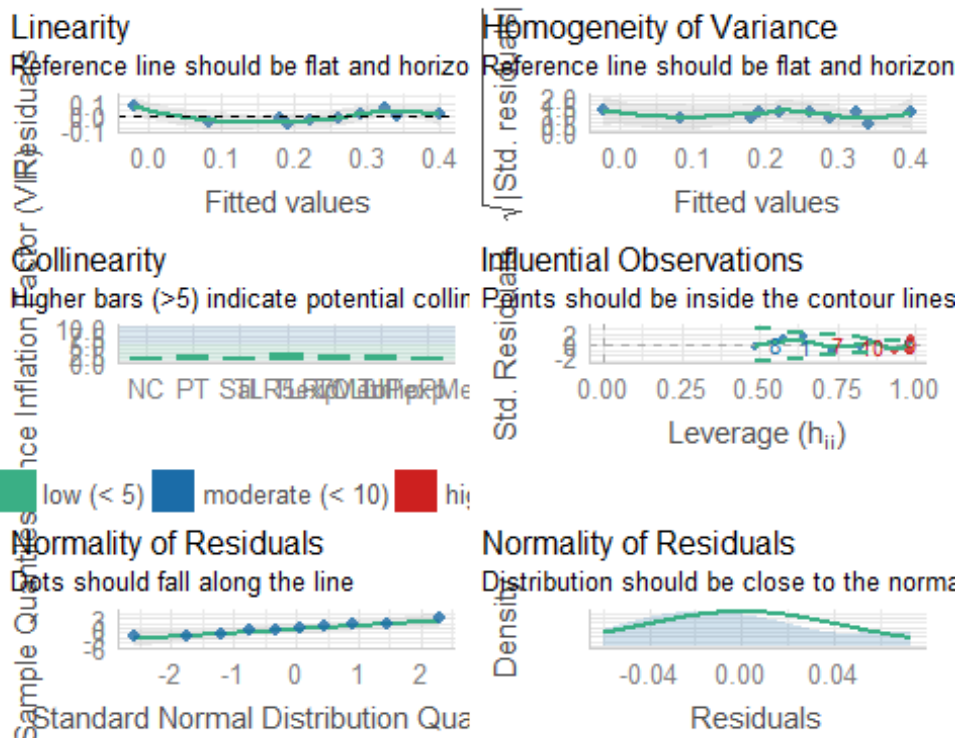
##
## Call:
## lm(formula = PZeloign ~ NC + Sal + PT + TOLLIPexp + TLR5exp +
##      TLR7Meth + TollipPMeth, data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7
##  -0.059556  0.064680  0.002469 -0.039697  0.016513 -0.021607 -0.029965
##  0.073109
##      9     10
```

```
## 0.011947 -0.017893
##
## Coefficients:
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -26.241812    8.217726  -3.193  0.0857 .
## NC          -0.054207    0.038843  -1.396  0.2976
## Sal          0.040904    0.041175   0.993  0.4252
## PT          -4.983967    4.120907  -1.209  0.3501
## TOLLIPexp    0.138161    0.045951   3.007  0.0951 .
## TLR5exp     -0.190374    0.050877  -3.742  0.0646 .
## TLR7Meth     0.291021    0.090634   3.211  0.0848 .
## TollipPMeth  0.009964    0.088362   0.113  0.9205
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.09154 on 2 degrees of freedom
## Multiple R-squared:  0.8956, Adjusted R-squared:  0.53
## F-statistic: 2.45 on 7 and 2 DF, p-value: 0.3203

check_collinearity(Mod32B) #en enlevant TAille et rajout TollipPMeth AIC meilleur

## # Check for Multicollinearity
##
## Low Correlation
##
##           Term  VIF Increased SE Tolerance
##           NC 1.58      1.26      0.63
##           Sal 1.64      1.28      0.61
##           PT 2.23      1.49      0.45
##           TOLLIPexp 2.22      1.49      0.45
##           TLR5exp 2.72      1.65      0.37
##           TLR7Meth 2.04      1.43      0.49
##           TollipPMeth 1.32      1.15      0.76

check_model(Mod32B)
```



Anova(Mod32B)

```
## Anova Table (Type II tests)
##
## Response: PZeloign
##           Sum Sq Df F value  Pr(>F)
## NC           0.016319  1  1.9476 0.29760
## Sal           0.008269  1  0.9868 0.42520
## PT            0.012256  1  1.4627 0.35006
## TOLLIPexp     0.075748  1  9.0404 0.09510 .
## TLR5exp       0.117314  1 14.0012 0.06458 .
## TLR7Meth      0.086388  1 10.3103 0.08483 .
## TollipPMeth  0.000107  1  0.0127 0.92052
## Residuals    0.016758  2
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

AIC(Mod32B)

```
## [1] -17.5361
```

#Pas d'effet pour PZeloign

#PZinterm

```
Mod4 <-
```

```
lm(PZinterm~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth+TLR2Meth+To1
```

```
lipPMeth, data=testFinale)
summary(Mod4)

##
## Call:
## lm(formula = PZinterm ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp + TLR7Meth + TLR2Meth + TollipPMeth, data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients: (1 not defined because of singularities)
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  33.37357      NaN      NaN      NaN
## Individu    -0.01069      NaN      NaN      NaN
## NC           0.09855      NaN      NaN      NaN
## Sal         -0.35187      NaN      NaN      NaN
## PT           9.56780      NaN      NaN      NaN
## Taille       0.30994      NaN      NaN      NaN
## TOLLIPexp    -0.34473      NaN      NaN      NaN
## TLR5exp       1.03405      NaN      NaN      NaN
## TLR7Meth     -0.50542      NaN      NaN      NaN
## TLR2Meth     -0.02240      NaN      NaN      NaN
## TollipPMeth      NA         NA      NA      NA
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared:      1, Adjusted R-squared:      NaN
## F-statistic:      NaN on 9 and 0 DF,  p-value: NA

Mod41 <-
lm(PZinterm~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth+TollipPMeth,
data=testFinale)
summary(Mod41)

##
## Call:
## lm(formula = PZinterm ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp + TLR7Meth + TollipPMeth, data = testFinale)
##
## Residuals:
## ALL 10 residuals are 0: no residual degrees of freedom!
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  48.953274      NaN      NaN      NaN
## Individu    -0.001876      NaN      NaN      NaN
## NC           0.063634      NaN      NaN      NaN
## Sal         -0.454550      NaN      NaN      NaN
## PT           8.572571      NaN      NaN      NaN
## Taille       0.292939      NaN      NaN      NaN
## TOLLIPexp    -0.400544      NaN      NaN      NaN
```

```

## TLR5exp      1.025461      NaN      NaN      NaN
## TLR7Meth     -0.684246      NaN      NaN      NaN
## TollipPMeth -0.187244      NaN      NaN      NaN
##
## Residual standard error: NaN on 0 degrees of freedom
## Multiple R-squared:      1, Adjusted R-squared:      NaN
## F-statistic:      NaN on 9 and 0 DF,  p-value: NA

Mod42 <- lm(PZinterm~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth,
data=testFinale)
summary(Mod42)

##
## Call:
## lm(formula = PZinterm ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp + TLR7Meth, data = testFinale)
##
## Residuals:
##          1          2          3          4          5          6          7
##          8
## -0.009227  0.050485 -0.032736 -0.055592  0.071234  0.004014 -0.034495
## 0.038945
##          9         10
## -0.029436 -0.003192
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 40.049309  16.345463   2.450   0.2467
## Individu    -0.005609   0.006899  -0.813   0.5654
## NC           0.065779   0.093454   0.704   0.6096
## Sal         -0.453944   0.089181  -5.090   0.1235
## PT           9.533982   9.581397   0.995   0.5016
## Taille       0.314855   0.036405   8.649   0.0733 .
## TOLLIPexp   -0.395279   0.063020  -6.272   0.1007
## TLR5exp      1.034181   0.121359   8.522   0.0744 .
## TLR7Meth    -0.601605   0.166863  -3.605   0.1722
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1244 on 1 degrees of freedom
## Multiple R-squared:  0.9982, Adjusted R-squared:  0.9842
## F-statistic: 70.96 on 8 and 1 DF,  p-value: 0.09157

Mod43 <- lm(PZinterm~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp,
data=testFinale)
summary(Mod43)

##
## Call:
## lm(formula = PZinterm ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp, data = testFinale)

```

```
##
## Residuals:
##      1      2      3      4      5      6      7      8
## 0.11206 -0.16085 0.08859 -0.16657 -0.02920 0.07492 -0.08403 0.30348
##      9     10
## -0.18609 0.04768
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -1.867e+01 3.654e+00 -5.109 0.0362 *
## Individu     9.092e-04 1.761e-02 0.052 0.9635
## NC          -1.281e-01 2.022e-01 -0.633 0.5912
## Sal         -5.371e-01 2.279e-01 -2.356 0.1426
## PT          -1.371e+01 1.875e+01 -0.731 0.5406
## Taille      4.021e-01 7.197e-02 5.587 0.0306 *
## TOLLIPexp   -2.927e-01 1.488e-01 -1.967 0.1880
## TLR5exp      7.656e-01 2.535e-01 3.021 0.0944 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.3291 on 2 degrees of freedom
## Multiple R-squared: 0.9754, Adjusted R-squared: 0.8892
## F-statistic: 11.32 on 7 and 2 DF, p-value: 0.08353

Mod44 <- lm(PZinterm~Individu+NC+Sal+PT+Taille+TOLLIPexp, data=testFinale)
summary(Mod44)

##
## Call:
## lm(formula = PZinterm ~ Individu + NC + Sal + PT + Taille + TOLLIPexp,
##     data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7      8
## 0.32166 -0.62869 -0.40695 -0.10818 0.32980 0.49310 0.19303 0.05073
##      9     10
## -0.35331 0.10880
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -23.89718 6.19838 -3.855 0.0308 *
## Individu     0.04508 0.01891 2.384 0.0973 .
## NC          -0.47372 0.32105 -1.476 0.2365
## Sal         -0.92334 0.36329 -2.542 0.0846 .
## PT          -45.84696 29.72921 -1.542 0.2207
## Taille      0.48088 0.12916 3.723 0.0337 *
## TOLLIPexp   -0.21650 0.28230 -0.767 0.4989
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
```

```
## Residual standard error: 0.6336 on 3 degrees of freedom
## Multiple R-squared: 0.8631, Adjusted R-squared: 0.5893
## F-statistic: 3.152 on 6 and 3 DF, p-value: 0.187

Mod45 <- lm(PZinterm~Individu+NC+Sal+PT+Taille, data=testFinale)
summary(Mod45)

##
## Call:
## lm(formula = PZinterm ~ Individu + NC + Sal + PT + Taille, data =
testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7      8
## 0.41518 -0.56643 -0.71399 0.01079 0.14748 0.54751 0.09859 0.25110
##      9     10
## -0.20710 0.01686
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -21.78436    5.25896  -4.142  0.0143 *
## Individu      0.03797    0.01561   2.432  0.0718 .
## NC           -0.39154    0.28664  -1.366  0.2437
## Sal          -0.80038    0.30876  -2.592  0.0605 .
## PT          -45.80153   28.15729  -1.627  0.1791
## Taille       0.44558    0.11429   3.899  0.0176 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.6001 on 4 degrees of freedom
## Multiple R-squared: 0.8363, Adjusted R-squared: 0.6316
## F-statistic: 4.086 on 5 and 4 DF, p-value: 0.0987

Mod46 <- lm(PZinterm~Individu+NC+Sal+PT, data=testFinale)
summary(Mod46)

##
## Call:
## lm(formula = PZinterm ~ Individu + NC + Sal + PT, data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7      8
## 0.32886 -0.08303 -1.11638 1.20879 -0.02655 -0.12740 0.31073 0.44277
##      9     10
## -1.76165 0.82386
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -1.58206    1.75577  -0.901  0.409
## Individu      0.02066    0.02933   0.705  0.513
## NC           0.29049    0.44492   0.653  0.543
```

```
## Sal          -0.22770    0.53216  -0.428    0.687
## PT           8.41374   47.97542   0.175    0.868
##
## Residual standard error: 1.176 on 5 degrees of freedom
## Multiple R-squared:  0.2141, Adjusted R-squared:  -0.4146
## F-statistic: 0.3405 on 4 and 5 DF,  p-value: 0.8406

Mod47 <- lm(PZinterm~Individu+NC+Sal, data=testFinale)
summary(Mod47)

##
## Call:
## lm(formula = PZinterm ~ Individu + NC + Sal, data = testFinale)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.76052 -0.06466  0.06909  0.36461  1.19443
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -1.43469    1.41162  -1.016   0.349
## Individu     0.02349    0.02243   1.047   0.335
## NC           0.28692    0.40698   0.705   0.507
## Sal         -0.21453    0.48240  -0.445   0.672
##
## Residual standard error: 1.077 on 6 degrees of freedom
## Multiple R-squared:  0.2093, Adjusted R-squared:  -0.1861
## F-statistic: 0.5293 on 3 and 6 DF,  p-value: 0.6785

Mod48 <- lm(PZinterm~Individu+NC, data=testFinale)
summary(Mod48)

##
## Call:
## lm(formula = PZinterm ~ Individu + NC, data = testFinale)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.8979 -0.1314  0.2128  0.3499  1.1957
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -1.14322    1.17642  -0.972   0.364
## Individu     0.01871    0.01853   1.010   0.346
## NC           0.35386    0.35579   0.995   0.353
##
## Residual standard error: 1.013 on 7 degrees of freedom
## Multiple R-squared:  0.1832, Adjusted R-squared:  -0.05016
## F-statistic: 0.785 on 2 and 7 DF,  p-value: 0.4925
```



```

Mod49 <- lm(PZinterm~Individu, data=testFinale)
summary(Mod49)

##
## Call:
## lm(formula = PZinterm ~ Individu, data = testFinale)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.8604 -0.2401 -0.0087  0.4646  1.7411
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) -0.82832    1.13225  -0.732   0.485
## Individu     0.01356    0.01777   0.763   0.468
##
## Residual standard error: 1.013 on 8 degrees of freedom
## Multiple R-squared:  0.06778,    Adjusted R-squared:  -0.04874
## F-statistic: 0.5817 on 1 and 8 DF,  p-value: 0.4675

AIC(Mod4)

## [1] -Inf

AIC(Mod41)

## [1] -Inf

AIC(Mod42)

## [1] -16.33578

AIC(Mod43)

## [1] 8.05393

AIC(Mod44)

## [1] 23.21304

AIC(Mod45)

## [1] 23.00342

AIC(Mod46)

## [1] 36.68872

AIC(Mod47)

## [1] 34.75005

AIC(Mod48)

```

```
## [1] 33.07434
AIC(Mod49)
## [1] 32.3961
Mod42 <- lm(PZinterm~Individu+NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth,
data=testFinale)
summary(Mod42)

##
## Call:
## lm(formula = PZinterm ~ Individu + NC + Sal + PT + Taille + TOLLIPexp +
##     TLR5exp + TLR7Meth, data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7
##      8
## -0.009227  0.050485 -0.032736 -0.055592  0.071234  0.004014 -0.034495
## 0.038945
##      9     10
## -0.029436 -0.003192
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 40.049309   16.345463   2.450   0.2467
## Individu    -0.005609    0.006899  -0.813   0.5654
## NC           0.065779    0.093454   0.704   0.6096
## Sal         -0.453944    0.089181  -5.090   0.1235
## PT           9.533982    9.581397   0.995   0.5016
## Taille       0.314855    0.036405   8.649   0.0733 .
## TOLLIPexp   -0.395279    0.063020  -6.272   0.1007
## TLR5exp      1.034181    0.121359   8.522   0.0744 .
## TLR7Meth    -0.601605    0.166863  -3.605   0.1722
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1244 on 1 degrees of freedom
## Multiple R-squared:  0.9982, Adjusted R-squared:  0.9842
## F-statistic: 70.96 on 8 and 1 DF,  p-value: 0.09157

check_collinearity(Mod42)#enlever individu

## # Check for Multicollinearity
##
## Low Correlation
##
##      Term  VIF Increased SE Tolerance
##      NC 4.97      2.23      0.20
##      Sal 4.17      2.04      0.24
##      Taille 4.89      2.21      0.20
```

```

## TOLLIPexp 2.26      1.50      0.44
## TLR7Meth 3.75      1.94      0.27
##
## Moderate Correlation
##
##      Term  VIF Increased SE Tolerance
## Individu 9.98      3.16      0.10
## PT 6.52      2.55      0.15
## TLR5exp 8.38      2.89      0.12

Mod4B <- lm(PZinterm~NC+Sal+PT+Taille+TOLLIPexp+TLR5exp+TLR7Meth,
data=testFinale)
summary(Mod4B)

##
## Call:
## lm(formula = PZinterm ~ NC + Sal + PT + Taille + TOLLIPexp +
##      TLR5exp + TLR7Meth, data = testFinale)
##
## Residuals:
##      1      2      3      4      5      6      7
## 0.045999 0.001867 -0.043785 -0.073669 0.103424 0.039386 -0.029182
## 0.003489
##      9     10
## -0.055310 0.007782
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 35.89056   14.14763   2.537  0.12655
## NC           0.01801    0.06623    0.272  0.81118
## Sal        -0.50695    0.05546   -9.141  0.01176 *
## PT          4.20664    6.37048    0.660  0.57692
## Taille      0.33094    0.02785   11.882  0.00701 **
## TOLLIPexp   -0.39489    0.05743   -6.876  0.02050 *
## TLR5exp      0.95591    0.06733   14.197  0.00492 **
## TLR7Meth    -0.56605    0.14675   -3.857  0.06111 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.1133 on 2 degrees of freedom
## Multiple R-squared:  0.9971, Adjusted R-squared:  0.9869
## F-statistic: 97.54 on 7 and 2 DF,  p-value: 0.01018

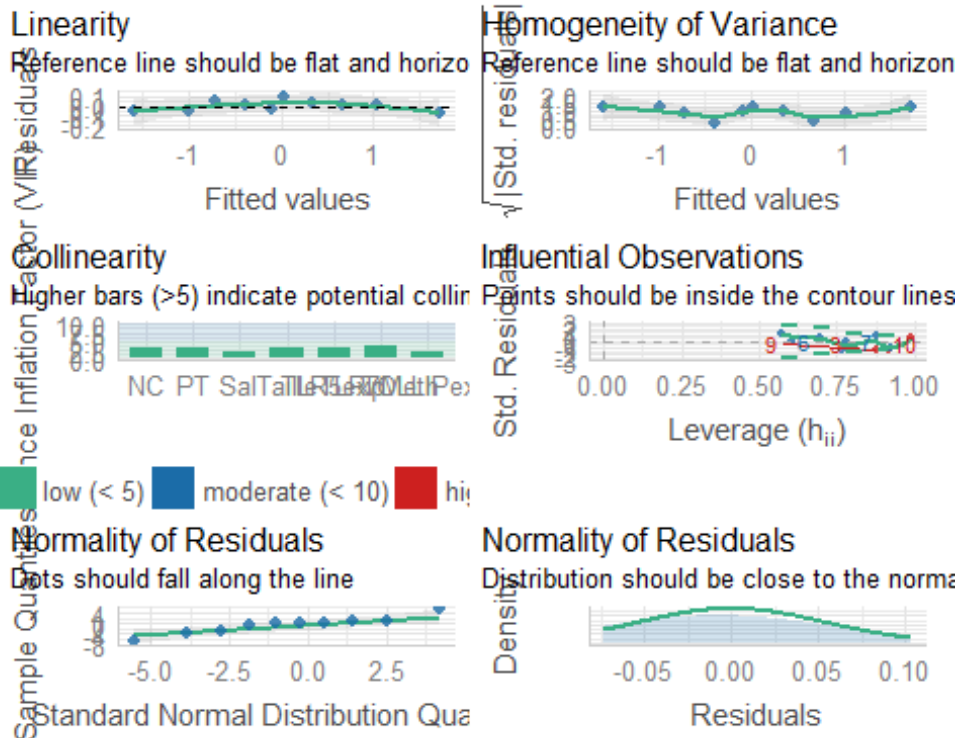
check_collinearity(Mod4B)

## # Check for Multicollinearity
##
## Low Correlation
##
##      Term  VIF Increased SE Tolerance

```

```
##          NC 3.00          1.73          0.33
##          Sal 1.94          1.39          0.52
##          PT 3.47          1.86          0.29
##          Taille 3.44          1.86          0.29
##          TOLLIPexp 2.26          1.50          0.44
##          TLR5exp 3.10          1.76          0.32
##          TLR7Meth 3.49          1.87          0.29
```

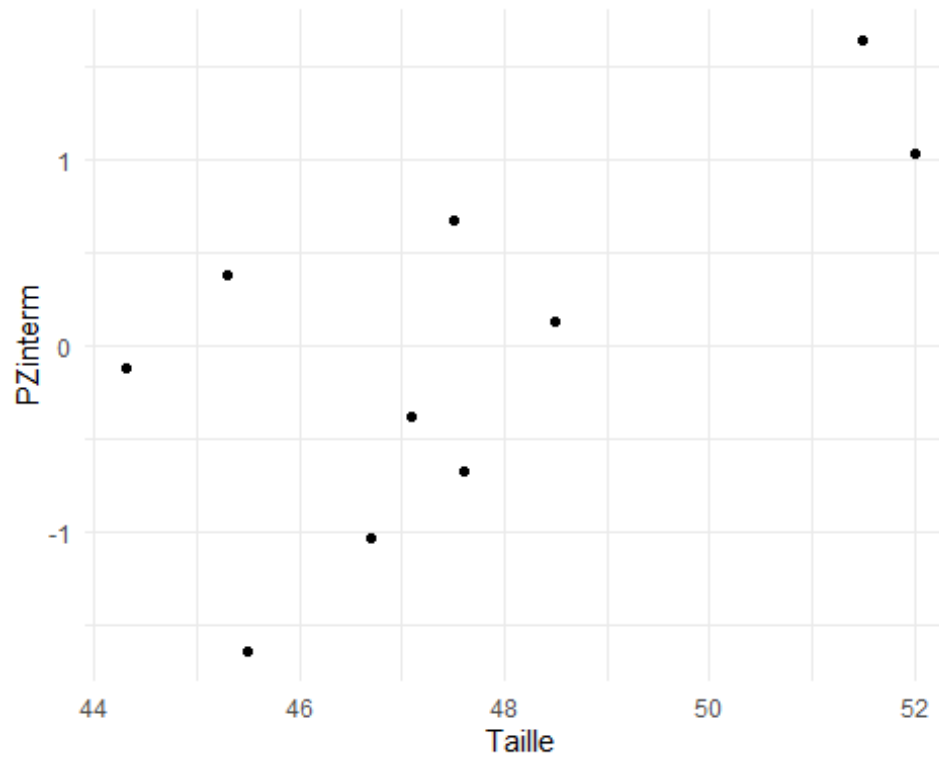
```
check_model(Mod4B)
```



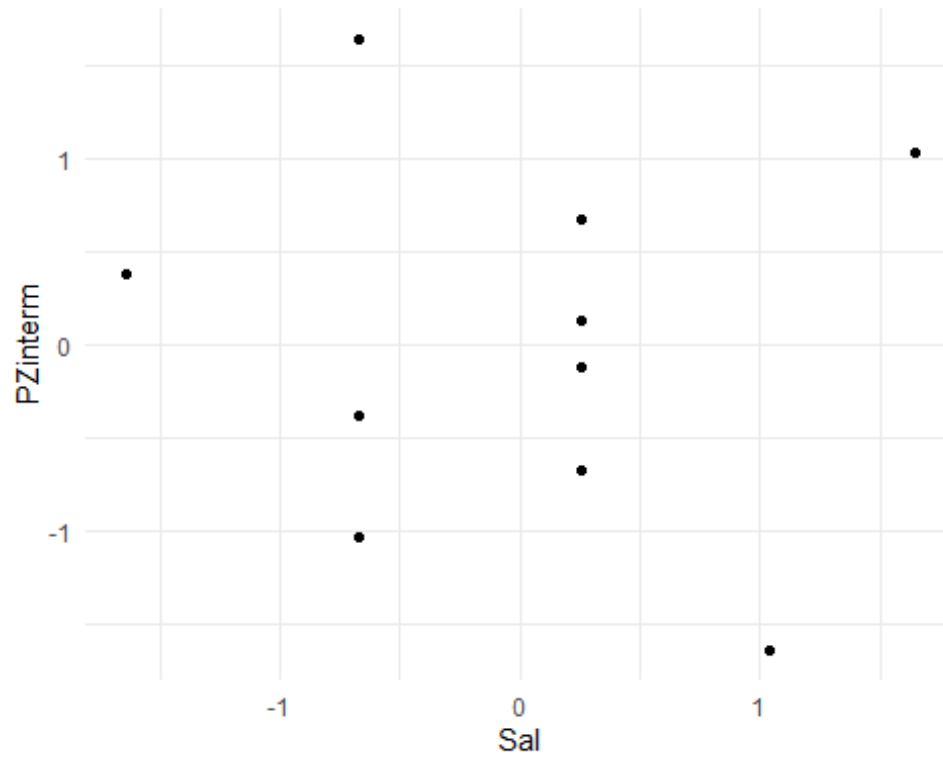
```
Anova(Mod4B)
```

```
## Anova Table (Type II tests)
##
## Response: PZinterm
##          Sum Sq Df F value    Pr(>F)
## NC          0.00095  1    0.0739 0.811177
## Sal         1.07351  1   83.5582 0.011757 *
## PT          0.00560  1    0.4360 0.576922
## Taille      1.81391  1 141.1875 0.007008 **
## TOLLIPexp    0.60745  1   47.2813 0.020502 *
## TLR5exp      2.58946  1 201.5540 0.004925 **
## TLR7Meth     0.19115  1   14.8785 0.061115 .
## Residuals    0.02569  2
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

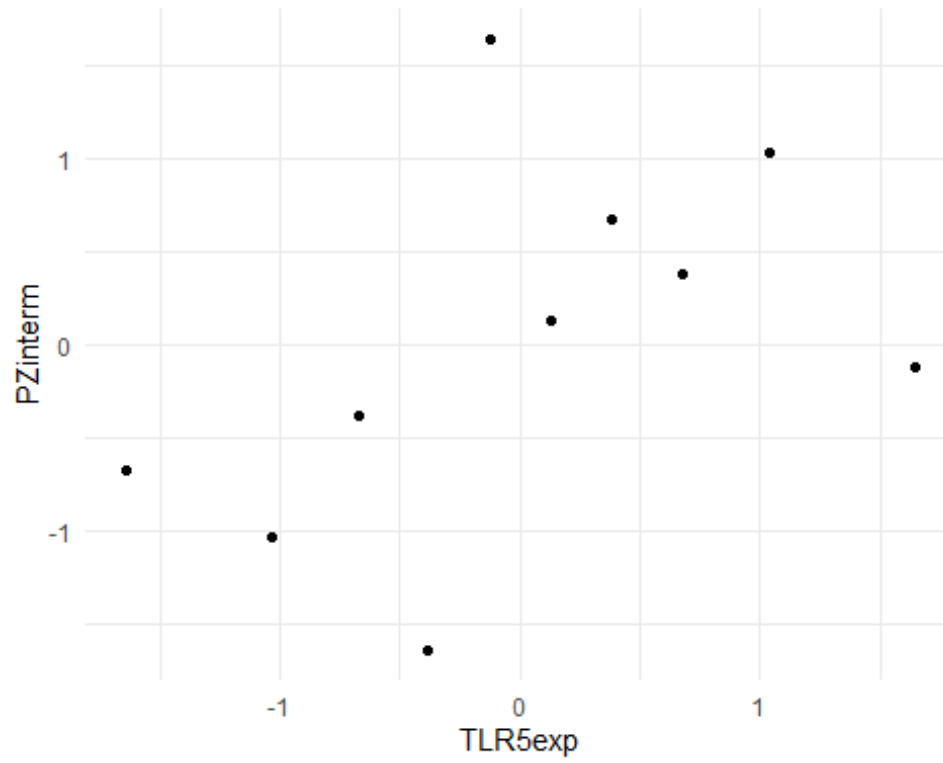
```
#Effet de sal, taille Tollipexp et TLR5exp sur PZinterm
ggplot(testFinale) +
  aes(x = Taille, y = PZinterm) +
  geom_point(shape = "circle", fill = "red") +
  theme_minimal()
```



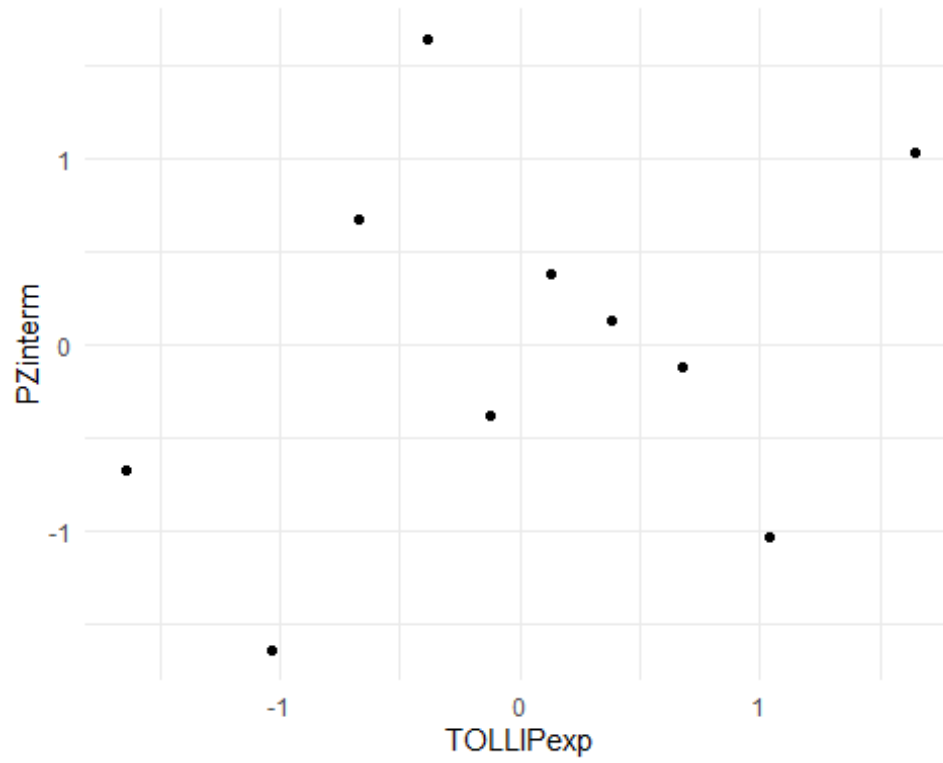
```
ggplot(testFinale) +
  aes(x = Sal, y = PZinterm) +
  geom_point(shape = "circle", fill = "red") +
  theme_minimal()
```



```
ggplot(testFinale) +  
  aes(x = TLR5exp, y = PZinterm) +  
  geom_point(shape = "circle", fill = "red") +  
  theme_minimal()
```



```
ggplot(testFinale) +  
  aes(x = TOLLIPexp, y = PZinterm) +  
  geom_point(shape = "circle", fill = "red") +  
  theme_minimal()
```



#rien de particulièrement intéressant graphiquement (petit N)