PCA for timeOmics data

PCA stats Package with timeOmics data

```
pacman::p_load(conflicted,
               wrappedtools,
               tidyverse,
               ggfortify, GGally,
               PCAtools, # bioconductor
               FactoMineR,
               writexl,readxl)

# conflict_scout()
conflict_prefer('slice','dplyr')
conflict_prefer("filter", "dplyr")
conflict_prefer('screeplot','stats')
conflict_prefer('biplot','stats')
```

```
rawdata <- read_excel("F:/bioinformatic_weiterbildung_final/longitudinalOmics/Data/timeOmi

head(rawdata[,1:7])
```

```
# A tibble: 6 x 7
  PatID time     c0   c1.0   c1.1    c1.2  c1.3
  <chr> <chr> <dbl>  <dbl>  <dbl>   <dbl> <dbl>
1 A     _1    0.681 -0.168 -0.134  0.120  0.446
2 A     _2    1.48   0.431  1.12  -0.0818 0.459
3 A     _3    0.945  1.47   1.61  -0.110  1.58
4 A     _4    0.740  1.12   1.77   0.175  1.41
5 A     _5    0.929  1.24   1.83  -0.0378 1.27
6 A     _6    1.04   2.31   2.53   0.231  2.11
```

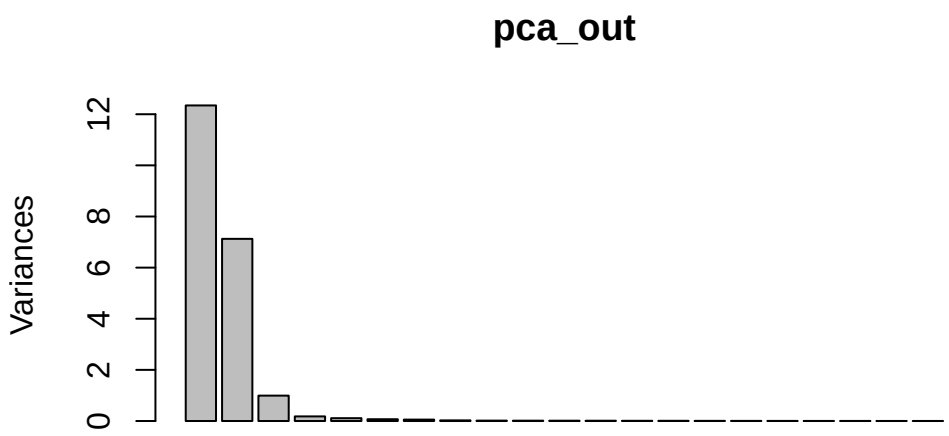
```
predvars <- FindVars(c('c'))
```

Note: after running this code you can see that there is no difference between the result of mixOmics::PCA and stats::prcomp

```
pca_out <- prcomp(rawdata |> select(predvars$names),
                  center = T,scale. = T)
summary(pca_out)
```

```
Importance of components:
                          PC1    PC2     PC3     PC4     PC5     PC6     PC7
Standard deviation     3.5135 2.6694 0.99679 0.42425 0.33302 0.26369 0.23584
Proportion of Variance 0.5878 0.3393 0.04731 0.00857 0.00528 0.00331 0.00265
Cumulative Proportion  0.5878 0.9272 0.97446 0.98303 0.98831 0.99162 0.99427
                           PC8     PC9    PC10    PC11    PC12    PC13    PC14
Standard deviation     0.15838 0.12599 0.11689 0.11002 0.10496 0.09309 0.09067
Proportion of Variance 0.00119 0.00076 0.00065 0.00058 0.00052 0.00041 0.00039
Cumulative Proportion  0.99547 0.99622 0.99687 0.99745 0.99797 0.99839 0.99878
                          PC15    PC16    PC17    PC18    PC19    PC20    PC21
Standard deviation     0.08044 0.06924 0.06123 0.05612 0.05380 0.04951 0.04663
Proportion of Variance 0.00031 0.00023 0.00018 0.00015 0.00014 0.00012 0.00010
Cumulative Proportion  0.99909 0.99931 0.99949 0.99964 0.99978 0.99990 1.00000
```

```
screeplot(pca_out,npcs = 21)
```




```
pca_out$rotation[1:10,1:5]
```

```
              PC1         PC2          PC3          PC4          PC5
c0    0.008171982  0.05115184 -0.992935864  0.058847963 -0.007486662
c1.0 -0.224507281  0.22675907  0.027514486 -0.039903518 -0.024074105
c1.1 -0.222863834  0.23079837  0.015133025  0.001363713  0.036056657
c1.2 -0.222288939  0.20738469 -0.017972987 -0.023972556  0.803942943
c1.3 -0.220950544  0.23091024  0.032416886  0.026968529 -0.178260257
c1.4 -0.224572414  0.22800681  0.021191688  0.026038521 -0.015835816
c2.0  0.223645058 -0.22769776 -0.008006748  0.061630205  0.014821792
c2.1  0.226778948 -0.22454754 -0.024015584 -0.003717985 -0.048782944
c2.2  0.232843327 -0.19133404  0.022100774 -0.012105940  0.473365368
c2.3  0.227506017 -0.22109334  0.017945486 -0.043383465  0.108238606
```