Introduction to Biostatistics

Instructor: Dr. Florian Battke, Dr. Battke SCIENTIA, Life Science Services

Date: November 8-10, 2021

Time: 9:00-14:30 h

Location: ONLINE course

Please register with the school management.

COURSE OUTLINE

Introduction of basic statistical principles

- Basic concepts of statistical data analysis
- General descriptive statistics

Statistical methods

- Background and requirements of statistical methods:
- Distributions and test statistics
- Confidence intervals
- General method of hypothesis testing

- Applying statistical methods:
- Basics of hypothesis testing
- Tests on outliers, Gaussian distribution and homogeneity of variance
- Parametric and non-parametric hypothesis testing
- Critical interpretation of test results
- Analysis of variance (one way ANOVA)
- Kruskal-Wallis / Friedmann test
- Post-hoc tests
- Two/three way ANOVA
- Correlation and regression analysis
- Linear and nonlinear regression
- Curve fitting and weighting
- Calibration curves
- Comparison of regression models

plus exercises

Agenda: *Introduction to Biostatistics*

Day 1

09:00 – 10:30 Basic statistical principles

- Basic concepts of statistical data analysis
- General descriptive statistics

10:30 – 10:45 Break

10:45 – 12:15 Statistical methods I

- Background and requirements of statistical methods:

- Distributions and test statistics
- Confidence intervals
- General method of hypothesis testing

12:15 – 13:00 Lunch break

13:00 – 14:30 Statistical methods II

- Applying statistical methods:

- Basics of hypothesis testing
- Tests on outliers, Gaussian distribution and homogeneity of variance
- Parametric and non-parametric hypothesis testing
- Critical interpretation of test results

Day 2

09:00– 09:15 Recapitulation

09:15 – 10:30 Exercises I

Introduction to analysis software (e.g. GraphPad Prism®)
Exercises

10:30 – 10:45 Break

10:45 – 12:15 Statistical methods III

- Applying statistical methods:

- Analysis of variance (one way ANOVA)
- Kruskal-Wallis / Friedmann test
- Post-hoc tests
- Two/three way ANOVA

12:15 – 13:00 Lunch break

13:00 – 14:30 Exercises II

Exercises

Day 3

09:00 – 10:30 Statistical methods IV

- Applying statistical methods:

- Correlation and regression analysis
- Linear and nonlinear regression
- Curve fitting and weighting
- Calibration curves
- Comparison of regression models

10:30 – 10:45 Break

10:45 – 12:15 Exercises III

Exercises

12:15 – 13:00 Lunch break

13:00 – 14:30 Additional topics & methods

Discussion and exercises on miscellaneous topics & methods

Recapitulation