



Biotechnology and  
Biological Sciences  
Research Council

**Foundation Masterclasses 2022/2023**  
**Statistics and Experimental Design (Set 1)**

*(mandatory for first-year EASTBIO PhD students – 10 training points)*

**Workshop leader: Dr Graham Horgan** (James Hutton Institute/Biomathematics & Statistics Scotland - BioSS)

**Dates:** Introductory Part A to be delivered online on the **22 September, 9:10-13:00** and Part B in person on the **4 October 2022, 9:15-13:00** (see schedule below for details)

**Venue:** Hermitage Iona, Stirling Court Hotel, Stirling

**Workshop description:**

This workshop will cover the basic concepts and terminology of statistics and the main issues to be considered in modelling data. Following student feedback on this training, we have split the workshop in two parts, the first an introductory course, delivered on the 22 September, online (via Teams; we will send link and details to students directly):

- **Part A** to cover basic concepts of statistics: distributions, summaries, transforms, standard error, p values, confidence intervals; considerations in the design of experimental and observational studies, including sample size, power, and modelling outcomes.
- **Part B** to cover linear model, regression and analysis of variance, logistic regression and odds ratios, mixed models and repeated measures. Depending on time, we will introduce multivariate methods and principal component analysis.

Questions and discussion will be encouraged during each session as well as at the end of the training.

**Learning outcomes:**

Understanding statistics terminology and recognising the issues to be considered in study design and in the modelling of outcomes. The second part of the training will introduce basic statistic methods of data analysis (as above).

**Part B - Training Schedule**

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| <b>9:15-10:45</b>  | Explaining study outcomes: the linear model, analysis of variance, confounding and adjustment, logistic regression and odd ratios.          |
| <b>10:45-11:15</b> | Coffee/tea break  |
| <b>11:15-13:00</b> | Recognising repeated measures and mixed models. Depending on time, we will introduce multivariate methods and principal component analysis. |
| <b>13:00-13:40</b> | Lunch and coffee/tea  |
| 13:45              | Close of Training Day and departure of delegates  |

**Participation requirements:**

Students are to bring a laptop if possible. Students are encouraged to think about the data they are likely to collect during their research in terms of questions such as: What is the research question? What are the main outcome(s) or response(s)? What known factors or variables might be influencing

this response? If experimental, what are we controlling? How might we decide how much data to collect? Responses and approaches to these questions will inform our research practice.

**Training webpage:** <http://www.eastscotbiodtp.ac.uk/foundation-masterclasses>

If you have further **questions**, please email [enquiries@eastscotbiodtp.ac.uk](mailto:enquiries@eastscotbiodtp.ac.uk).