

# 10 | Science communication

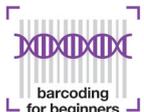


## Equipment list

- Computer for:
  - poster presentation
  - questionnaire
- Poster presentation template
- Questionnaire for completion (available in Google Forms): [bit.ly/B4B-PostQ](https://bit.ly/B4B-PostQ)
- Declaration of consent form for completion by students and their parents

**Title of the experiment / project**

By Author



**Summary**

What did the project set out to do? Like an overview.

Figure 4: Image of something related to the project.

**Introduction**

Explain the scientific terms in the project (eg. species, barcoding, phylogenetic relationship). Should be easily readable for a non-specialist.

**Method**

Give a step-by-step guide in bullet points / numbered points of what you will do during the project.

**Results**

What did we find? Describe the results obtained.

**Conclusion / evaluation**

Explain the results obtained - do the results fit with other work? Do they fit with expectations?  
Was the project successful? What would you change another time / what did you learn?

**Figure 2:** Image of findings of the project.

References

https://www.yourgenome.org

## Instructions | Poster presentations

Poster presentations are often used by early career scientists as a way of sharing their ideas, methodology and results at scientific conferences. A poster will be prepared and printed before a conference, then displayed during a conference. There is often a poster session, during which scientists stand next to their poster to answer any questions about their work. As one of the scientists says in the Open lab video, ‘What’s the point in knowing something if it’s hidden in a cupboard somewhere and no one else can access it?’.

Communication is an important skill for scientists and since you have completed authentic, new scientific research, it would be great to share your findings widely. To do this you should complete a scientific poster.

### 1. Create a scientific poster

There is a common format to scientific posters, shown in the **poster presentation template**.

A member of Wellcome Connecting Science staff who completed the Barcoding for beginners course has also shared her poster and is happy for you to use any part of it that is useful as you put yours together.

## Barcoding for biodiversity: Using DNA barcoding to identify an unknown invertebrate

By Karen Stephens



barcoding  
for beginners

### Summary

Invertebrates are the most common type of animal. This project aims to sample invertebrates from around my workplace and identify them. The invertebrates will be identified using DNA barcoding. DNA barcoding uses a DNA sequence that is constant within a species, but varies between species for identification.

### Introduction

About 95% of animals are invertebrates (Eisenhauer and Hines, 2021). Invertebrates provide many ecosystem services, like pollination and organic matter recycling (Ganglies and Casas, 2019), yet their roles are not well understood, invertebrate biodiversity is declining, and it is estimated that about 50% of insect species have yet to be named (Van der Sluis, 2020). In this project we use DNA barcoding to identify invertebrates around our workplace.

This project is similar to BIOSCAN, a 5 year project looking at the genetic diversity of flying insects in the UK (Wellcome Sanger Institute, 2023). Our data will contribute to characterising invertebrate biodiversity. DNA barcode data can be used for DNA-based bioexploration and biomonitoring of insect populations over time (Chua et al., 2023).



Figure 1: My invertebrate for investigation. This 1 cm long hairy orange fly was found on the windowill in Histon Hall at the Wellcome Genome Campus.



Figure 2: The stages of invertebrate identification using DNA barcoding.

### Results

Gel electrophoresis showed that the DNA extraction and PCR were successful in amplifying the DNA barcode from my hairy orange fly (Figure 3A). My chromatogram showed that the DNA sequence was accurate, as it had distinct and evenly-spaced peaks (Figure 3B). When aligned to the NCBI database using a BLAST, there was a match that had alignment for 100% of the sequence and an E value of 0 (very high probability of it being the same DNA sequence). This alignment was for a muscid fly, *Phaonia subventa* (Figure 3C).

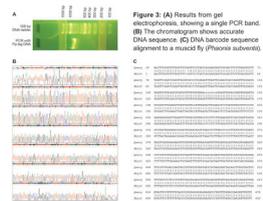


Figure 3: (A) Results from gel electrophoresis, showing a single PCR band. (B) The chromatogram shows accurate DNA sequence. (C) DNA barcode sequence alignment to a muscid fly (*Phaonia subventa*).

### Conclusion / evaluation

Using DNA barcoding my invertebrate sample was identified as a muscid fly. Its binomial classification is *Phaonia subventa*. There are several very similar-looking orange flies (NatureSpot, 2024), but DNA barcoding allowed definitive identification.

During this project I got to use practical molecular biology techniques, met some very friendly people at the Wellcome Sanger Institute and learnt more about how scientific projects are run. It is fun to use proper scientific equipment and techniques to try and answer questions – I'd like to do more of this!

### 2. Submit your poster

When you have completed your scientific poster you should submit it to your teacher. They will send it to [engage@wellcomeconnectingscience.org](mailto:engage@wellcomeconnectingscience.org). All completed posters of good quality will be printed for display in your school, so that your scientific experience can be shared more widely with other students.