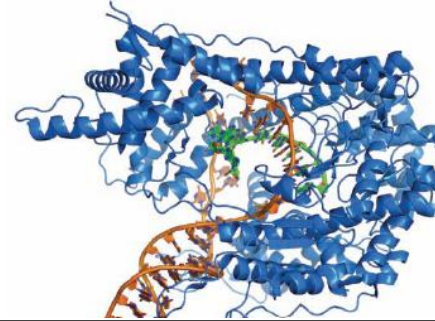


'Polymerase Chain Reaction (PCR)'



Session Outline:

Polymerase Chain Reaction, or PCR as it is commonly known, is a technique used in molecular biology to amplify sequences of DNA. In this workshop, students will use their own cheek cells as the DNA source and carry out their own PCR reaction, amplifying DNA and visualising the products of their reaction by means of gel electrophoresis. In addition, students will gain complementary and additional knowledge of the real-life applications of science and also first-hand experience using laboratory equipment.



This is a **FULL DAY session (5 hours)**. There is a 15 minute break and a 45 minute lunch break during the workshop. Owing to the type of equipment and level of supervision involved in this practical it is ideal for **16 A/AS level students**. As the exact programme of study varies with each exam board at KS5, if you have any queries about how this session could fit in with your particular requirements please feel free to contact The Manchester Museum for further advice

Before your visit to the Museum, you may find it helpful to discuss the following learning objectives with your class. This will give students a brief idea of what to expect in the session and will provide them with a basic scaffold of information on which they can apply the knowledge they will acquire over the course of the session.

Key Points covered in this session:

- The structure, chemical composition, function and location of DNA
- The use of primers specific to certain sequences of DNA
- DNA polymerase, it's function and uses
- The basic principle of the Polymerase Chain Reaction
- Applications of PCR in medicine, forensics and research
- Use of specialised scientific equipment (including micropipettes, gel electrophoresis equipment, PCR thermo-cycler)
- Experimental design
- Data interpretation
- Applications of scientific techniques to real-life

Skills/Practical Techniques

Over the course of the session, pupils will:

- Use centrifuges to separate cells from a liquid suspension
- Learn to accurately measure small volumes of liquid using a micropipette
- Amplify DNA by means of PCR using primers, DNA polymerase, DNA template, a source of chemical bases and a thermo-cycling PCR machine
- Use a micropipette to load DNA into an agarose gel and separate DNA samples using the process of gel electrophoresis
- Learn to stain DNA specifically within the gel and visualise DNA samples
- Predict and interpret the pattern of DNA fragments on a gel, following gel electrophoresis
- Appreciate the importance of accuracy and reliability in experimental science, including the need for experimental controls.
- Understand the applications and implications of PCR in the real world.