

04 | DNA extraction



Aim Extract DNA from biological samples minimising opportunities for contamination or DNA degradation.

Activity outline Use a method of DNA extraction involving heating in an alkaline environment to obtain DNA from the sample collected.

This DNA will be stored until the next session, when it will be used in PCR.

Age range Key stage 4 and above (14 years and older)

Timing 10 min - checking samples are collected, photographed and recorded
10 min - talking through the procedure
40 min - extracting DNA

Venue This practical activity needs to be carried out in a science laboratory

Resources

- Instructions for collecting and recording a sample for barcoding (repeated from session 2)
- A sample information record sheet (repeated from session 2)
- Student protocol: Sample selection and DNA extraction
- **Presentation:** 04_P_DNA-extraction

Preparation

Before the session

For each pair of students, prior to the session:

- Prepare a microfuge tube, labelled **CHEL**, containing 200 μ l of 10% Chelex.

▲ Important: You will need to shake the tube of 10% Chelex vigorously every time before you dispense, as it is a solution that settles very rapidly.

Label	Tube contents	No. of tubes	Aliquot	Used
CHEL	10% Chelex	1 per pair	200 μ l	200 μ l

- Cut a strip of Parafilm™, each about 1 cm wide.
- Cut a piece of aluminium foil about 10 cm².

Laboratory set up

Laboratory work stations

At the start of the session set up the laboratory work station for each pair of students, so that it contains:

- Access to a P200 micropipette
- Access to a box of micropipette tips
- Waste container
- Permanent marker pen
- White cutting tile
- Scalpel
- Plastic pestle
- Piece of Parafilm™
- Piece of aluminium foil
- Heatproof beaker
- Stopwatch
- Microfuge tube rack
- Microfuge tube of **CHEL** (200 μ l of 10% Chelex)

Class equipment

Set up the science laboratory to contain:

- Beaker of empty microfuge tubes
- Microcentrifuge
- Kettle
- Gloves

Disposal

The pipette tips and microfuge tubes that come into contact with biological materials will be autoclaved to denature the DNA and enzymes before disposal. Used tips and microfuge tubes should be placed into a sealed plastic jar for autoclaving later.

Plastic pestles should be washed thoroughly and returned with the rest of the kit.

White tiles and scalpels should be washed thoroughly, following the normal school procedures.