

04 | DNA extraction



| | |
|-------------------------|--|
| Aim | Extract DNA from biological samples minimising opportunities for contamination or DNA degradation. |
| Activity outline | <p>Use a method of DNA extraction involving heating in an alkaline environment to obtain DNA from the sample collected.</p> <p>This DNA will be stored until the next session, when it will be used in PCR.</p> |
| Age range | Key stage 4 and above (14 years and older) |
| Timing | <p>10 min - checking samples are collected, photographed and recorded</p> <p>10 min - talking through the procedure</p> <p>40 min - extracting DNA</p> |
| Venue | This practical activity needs to be carried out in a science laboratory |
| Resources | <ul style="list-style-type: none"> • 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 µl 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 µl | 200 µl |

- ☐ 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 µl 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.