Student Handout

What is electrophoresis?

It is the process of separation using an electric current.

The agar acts as a molecular sieve, where small molecules can pass through the matrix easily and larger molecules are retarded when placed under an electric current. DNA is negatively charged as are the dyes provided, so they will migrate towards the positive anode at a rate which depends on their molecule size.

1. Ensure the gel is in the ‘running’ position. This is done by turning the gel tray 90° clockwise, so that the sample comb is placed over the red stripe, (at the left-hand side of the tank.)

2. Pour the 10mM NaHCO₃ buffer into the gel tank at both ends until the gel is completely covered. DO NOT fill the tank past the ‘MAX FILL’ mark.

3. Gently remove the sample comb from the gel, being careful not to damage the individual sample wells. You may need to add more buffer at this stage to ensure your gel is once again completely submerged.
4. Using the Gilson micro-pipettor, yellow tips and blue water provided, practise drawing up and dispensing until you are confident with your pipetting action.

5. Load 10ul of each sample into the sample wells. Once all wells are loaded, place the lid on the gel tank and plug the other ends of the leads into the power pack.

6. Ensure the power pack is set at 90V for 30 minutes. Once all 4 gels are connected to the power pack, press the ‘Start/Pause’ button and the red light above the button should light up. Watch for tiny bubbles at both ends of the gel tank which indicates the electric current is being produced.

7. After 30 minutes, separated coloured bands should be visible. Press the ‘Stop’ button and remove the lid from the gel tank by pressing down on the white knobs, and lifting the lid.

8. Carefully lift the gel tray out of the tank, blocking both ends with your fingers to prevent the gel slipping out. Interpret the separation patterns.