COGLS330
Analyses of dna using gel electrophoresis in life sciences and related industries

Overview

This standard covers the skills you need to carry out DNA sample analysis by gel electrophoresis using approved procedures. This involves setting up and running gel electrophoresis and repeating the analysis to confirm or clarify the results. It is important to present records and details of your work in a consistent and accurate way

Your underpinning knowledge will provide a good understanding of this process and its application an enable to analyse and present data and results

Who this standard is for

The standard is recommended for all staff but particularly junior laboratory technicians.

Performance criteria

You must be able to:

- P1 ensure that your work is carried out in accordance with standard operating procedures including those for infection control
- P2 prepare the gel for the amplified DNA fragment.
- P3 ensure that appropriate dyes are added to the gel during setup, according to standard operating procedures
- P4 load the DNA reference ladders and samples with the appropriate DNA visualisation dye, and run gels according to standard operating procedures
- P5 visualise the gel, as appropriate, and according to standard operating procedures
- P6 dispose of spent materials (gel and buffer systems) appropriately and according to local requirements
- P7 evaluate the data, in accordance with standard operating procedures and laboratory instructions
- P8 communicate the required information the work done to authorised people

Knowledge and understanding

You need to know and understand:

K1 the health and safety and other legislative requirements of the area in which you are carrying out the scientific or similar activities

K2 the standard operating procedures, as set down in local laboratory manuals

K3 the limits of your own authority and to whom you should report if you have problems that you cannot resolve

K4 the range of samples analysed, the containers used for sample storage in the laboratory, and other essential resources needed for each investigation

K5 the importance of keeping the work area clean and tidy, and of avoiding cross contamination of samples

K6 the main types of gel solution used for analysis (such as gel percentage (between 0.2 and 2%) for large and small DNA fragments)

K7 the different types of gel tank used (such as 8x10cm gel (minigels))

K8 the typical DNA sample size to be loaded for a ladder to be visible under UV light

K9 the range of gel combs available, and the main factors to consider when selecting one for use (such as DNA sample size, number of teeth)

K10 how to transfer an appropriate amount of each sample to a fresh microfuge tube and add an appropriate amount of loading buffer and DNA sample onto the gel

K11 how to load the gel tray with marker before and after loading the samples

K12 how to close the gel tank, switch on the power source and run the gel at the correct voltage and time

K13 when to switch off the power supply (such as when the dye is 2/3 to ¾ of the way down the gel) and use a stain box to stain the gel ladder

K14 how to view and record data from the gel ladder (such as UV light and a digital camera)

K15 how DNA samples can be excised from gels when isolation is required

K16 how to construct and use a calibration curve for markers

K17 how to record and interpret results from gel electrophoresis

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