
Overview

This standard covers the skills you need to carry out laboratory culturing/fermentation of cells using batch fed or continuous culture fermenter in accordance with relevant standard operating procedures, legislation and organisational policy.

This involves setting up and operating the fermenter, choosing the correct programme, monitoring and analysing the operations and making adjustments when required. You will handle potentially dangerous cultures, materials and chemicals, therefore you must ensure that they are contained, handled and disposed of correctly.

Your underpinning knowledge will provide a good understanding of your work in order to produce and accumulate an end product to the expected quality and accuracy.

Who this standard is for

The standard is recommended for new recruits and junior laboratory staff.

**Performance
criteria**

- You must be able to:
- P1 ensure that your work is carried out in accordance with standard operating procedures and manufacturer's guidelines
 - P2 prepare the fermenter for fermentation
 - P3 inoculate the fermentation medium with a starter culture and monitor the culture purity and growth rate during the growth stage
 - P4 monitor the fermentation using the software, making additions to the fermenter vessel when necessary
 - P5 take samples to monitor the progress of cell growth and production of metabolites
 - P6 harvest the culture at the required growth phase/cell density/metabolite production
 - P7 dispose of spent material in accordance with departmental procedures
 - P8 disinfect and clean the fermenter ready for next use
 - P9 communicate the required information about 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 minimum size/volume/cell density of any starter culture required
- K5 the range and condition of essential resources needed for each investigation
- K6 the importance of keeping the work area clean and tidy, and of avoiding cross contamination of samples
- K7 the main features of the fermenter, and the underlying action of the cells, media and reagents involved in the fermentation reaction vessel
- K8 the various fermentation operations that can be performed, and the cells, methods and reaction mixtures used
- K9 how to dismantle the fermenter, calibrate probes and sterilise components before commencing fermentation
- K10 how to apply good aseptic techniques, and how to reassemble the sterilised fermenter prior to the culture fermentation activities
- K11 the manufacturer's instructions for changing programs and maintenance items in the fermenter
- K12 how to interpret the fermenter visual display, and how to understand and act on the various messages displayed including error messages
- K13 the typical fermentation faults, and the actions to be taken if they occur
- K14 the procedures to be followed when dealing with broken or leaking samples and disposing of harmful cultures, by-products and contaminated equipment

Developed by	Cogent
Version number	1
Date approved	October 2013
Indicative review date	October 2018
Validity	Current
Status	Original
Originating organisation	Cogent
Original URN	COGLS329
Relevant occupations	Associated Professionals and Technical Occupations; Science and Mathematics; Science; Science and Engineering Technicians; Professional Occupations; Science Professionals
Suite	Life Sciences and Related Industries 3
Key words	laboratory; workplace; culturing; fermenting; cells; control fed batch; continuous culture fermentation