



Australian Government

MSL975033 Perform tissue and cell culture techniques

Release: 1

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Modification History

Release	Comments
Release 1	This version was released in <i>MSL Laboratory Operations Training Package Release 2.0</i>. Supersedes and equivalent to <i>MSL975013 Perform tissue and cell culture techniques</i>. Changed prerequisites. Changes to performance criteria. Range of conditions removed. Assessment requirements amended.

Application

This unit of competency describes the skills and knowledge to prepare, maintain and preserve cells and cell lines for a variety of applications, such as large scale culture, production of monoclonal antibodies, production of viral vaccines and amniocentesis studies. Personnel are required to optimise equipment set-up, media and growth techniques. They are required to detect and investigate contamination and take preventative and/or corrective actions under supervision.

This unit applies to laboratory technicians and technical officers working in laboratories in the biomedical, environmental, biotechnology and education industry sectors.

No licensing or certification requirements exist at the time of publication. However, regulations and/or external accreditation requirements for laboratory operations exist, so local requirements should be checked. Relevant legislation, industry standards and codes of practice within Australia must also be applied.

Pre-requisite Unit

MSL973016 Perform aseptic techniques

Competency Field

Testing

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|---|--|-----|---|
| 1 | Interpret and schedule production requirements | 1.1 | Review client request and confirm quantity and nature of cells, tissue or products |
| | | 1.2 | Select appropriate media, materials, equipment and methods |
| | | 1.3 | Plan parallel work sequences to optimise production |
| | | 1.4 | Maintain a chain of custody, traceable to the worker, for all cells and tissues |
| | | | |
| 2 | Work safely according to the legal and regulatory framework | 2.1 | Identify hazards and workplace control measures associated with the sample, preparation methods, reagents and equipment |
| | | 2.2 | Select, fit and use personal protective equipment (PPE) |
| | | 2.3 | Address hazards and incidents as they arise |
| | | 2.4 | Safely dispose of biohazardous materials and other laboratory waste |
| | | | |
| 3 | Assemble and maintain tissue culture equipment | 3.1 | Assemble, sterilise or decontaminate equipment according to workplace procedures |
| | | 3.2 | Perform pre-use and safety checks in accordance with relevant workplace and operating procedures |
| | | 3.3 | Identify faulty or unsafe components and equipment and report to appropriate personnel |
| | | 3.4 | Decontaminate area and equipment after use |
| | | | |
| 4 | Prepare and test cell and tissue culture media | 4.1 | Confirm media specifications and processes/methods |
| | | 4.2 | Prepare culture media to suit client request |
| | | 4.3 | Sterilise culture media and check for sterility |

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
		4.4	Perform quality control checks to ensure that culture media is fit for purpose
		4.5	Store culture media in accordance with specifications
5	Obtain, monitor and maintain tissue and cell lines	5.1	Retrieve/obtain the cell lines or tissue sample from fresh or preserved sources and prepare a culture
		5.2	Select specified culture media and add any necessary growth agents or nutrients
		5.3	Incubate cells/tissue in specified conditions
		5.4	Inoculate the media with the specified amount of sample
		5.5	Monitor growth of tissue and cell lines and products
		5.6	Detect contamination/abnormalities and troubleshoot materials, equipment and techniques
		5.7	Passage samples by subculturing to preserve or grow the line
		5.8	Harvest cells or cell products to optimise yields
6	Preserve cells and tissues	6.1	Select the appropriate preservation method
		6.2	Preserve the cell lines or tissue in accordance with the method
		6.3	Check preserved cell lines regularly to ensure viability is maintained
7	Maintain records	7.1	Maintain records of batches of media
		7.2	Maintain records of active and stored tissue and cell lines
		7.3	Complete records so that they are retrievable, legible and accurate

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- 7.4 Ensure records conform to the information management, records, quality system and legal requirements

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Unit Mapping Information

Equivalent to MSL975013 Perform tissue and cell culture techniques, Release 1.

Links

Training Package Companion Volumes -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>

Assessment Requirements for MSL975033 Perform tissue and cell culture techniques

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and:

- safely prepared and maintained 3 different cell cultures to preserve cells and cell lines that are fit for purpose without contaminating the original sample, including:
 - passaging cell cultures by subculturing
 - preserving cell lines by freezing and cryopreservation
- confirmed the identity of the cell lines and identified abnormalities/contamination if present
- maintained accurate, traceable records of cell lines and tissues and logs of procedures and work completed.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- terminology, including cell lines, growth media, primary culture, passaging, passage number, subculture, anchorage dependent cells, suspension culture, monolayer, confluent, cell line, cell strain, contact inhibition, diploid and viability
- cell biology, including structure, physiology, function, physiological cell growth requirements, nutrient requirements, respiration, temperature and growth cycle
- general purpose of cell lines
- normal and abnormal cell morphology
- critical components of the cell environment and their effects on cell growth, including pH, temperature, buffering, atmosphere, osmotic pressure, osmolarity and viscosity
- types of tissue/cells used as source material
- techniques for characterising a cell line

- selection criteria for media, materials and equipment, including:
 - costs
 - ease of cleaning or sterilisation
 - maintenance of cell growth
- the differences between finite and continuous cell lines
- characteristics of cell culture media and substrates
- nature of substrates including solid, semi-solid, gel or sponge, glass, disposable plastics and three-dimensional matrices
- chemical treatment techniques for pre-treating substrates relevant to the job role
- role of common ingredients in media including salts, carbohydrates, amino acids, vitamins, growth factors, serum and antimicrobial
- contaminants, including endotoxins, bacteria, yeast, fungi and mycoplasma
- typical requirements, problems and procedures associated with the production of specific cell lines relevant to the job role
- tissue culture and continuous culture systems
- methods to prepare primary cultures
- principles and purpose of techniques implemented
- methods to monitor growth of tissue and cell lines
- awareness of environmental sustainability issues as they relate to the work task
- legal, ethical and work health and safety (WHS) requirements specific to the work task including traceability, confidentiality and security requirements of all client information, and laboratory data and records.

Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - laboratory equipped with appropriate tissue culture equipment and facilities, test equipment, instruments, standards and reagents
 - workplace procedures and standard methods, test results and records.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

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