



Australian Government

MSL974025 Prepare tissue and cell cultures

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 MSL974011 Prepare tissue and cell cultures. Foundation skill information added. Range of conditions removed. Assessment requirements amended.

Application

This unit of competency describes the skills and knowledge to prepare primary tissue cultures for applications, such as maintenance of animal cell lines and propagation of plants by tissue culture, and basic subculture procedures. Personnel are required to manipulate equipment and materials and samples to prevent contamination at all preparation stages. They will have ready access to workplace procedures and will work under direct supervision.

This unit applies to technical assistants 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.

1 **Work safely**

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
	according to the legal and regulatory framework	1.1	Identify hazards and workplace controls associated with the sample, preparation methods, reagents and equipment
		1.2	Select, fit and use personal protective equipment (PPE)
		1.3	Address hazards and incidents as they arise
		1.4	Maintain a chain of custody, traceable to the worker, for all cells and tissues
2	Prepare and test cell and tissue culture media	2.1	Select and confirm media specifications and processes/methods
		2.2	Prepare culture media to suit the application
		2.3	Sterilise culture media and check for sterility
		2.4	Perform quality control checks to ensure that culture media is fit for purpose
		2.5	Store culture media in accordance with specifications
3	Prepare tissue or cell cultures	3.1	Select tissue/cell sample to optimise growth and prepare it for culture
		3.2	Add specified growth agents and/or nutrients
		3.3	Inoculate culture medium using aseptic techniques
4	Monitor tissue or cell culture	4.1	Incubate culture in specified conditions
		4.2	Monitor growth of culture and record appearance and characteristics
		4.3	Report presence or absence of contamination
		4.4	Subculture the culture to continue the cell line
		4.5	Dispose of biohazardous and other laboratory waste safely

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

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|---|-------------------------|-----|--|
| 5 | Maintain records | 5.1 | Maintain records of batches of media |
| | | 5.2 | Complete records of tissue cultures so that they are retrievable, legible and accurate |
| | | 5.3 | Complete records in accordance with 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.

- Learning skills to:
 - monitor cell growth, check growth rates and recognise problems, such as contamination of media by bacteria (e.g. Mycoplasma), fungi and other plant or animal tissue
 - identify expected cell types and recognise normal and abnormal cells using an inverted microscope.

Other foundation skills essential to performance are explicit in the performance criteria of this unit.

Unit Mapping Information

Equivalent to MSL974011 Prepare tissue and cell cultures, Release 1.

Links

MSL Laboratory Operations Companion Volume Implementation Guide is available from VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>

Assessment Requirements for MSL974025 Prepare tissue and cell cultures

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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 preparing at least 3 different primary tissue/cell cultures that are free of contamination using tissue/cell culture and basic subculture procedures, including:
 - manipulating equipment and materials and samples to prevent contamination at all preparation stages
 - performing routine maintenance and checks on raw materials and consumables, including use-by-date, possible contamination and storage conditions
 - growing cell lines and tissue to specifications without contaminating the original sample and the environment.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- basic classes and classification of culturable material including microorganisms, plant/animal cells and tissue
- structure and function of plant/animal cells and organelles
- cell structure, physiology and processes, including simple and facilitated diffusion, plasmolysis, osmosis, tonicity, active transport, energy production, mitosis, motility, phagocytosis and pinocytosis
- concepts and principles of cell growth, including the need for nutrients, the role of growth regulators and the removal of wastes
- types and sources of contamination
- importance of strict aseptic techniques and cleaning procedures
- common applications of plant tissue/cell culture
- common applications of animal tissue/cell culture

- typical methods for sterilisation and disposal of biohazardous:
 - steam and high-pressure air or steam
 - boiling, microwaving and autoclaving
 - filtration
 - gas, chemical and radiation
- typical methods to preparing a primary culture
- suitable culture conditions
- subculture
- quality control checks and quality assurance procedures
- standard methods for preparing culture media, and operation and maintenance manuals for automated media preparation equipment
- workplace and/or legal traceability requirements
- 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.

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:
 - a laboratory equipped with appropriate equipment, samples, cell lines and reagents
 - tissue culture equipment and facilities, including:
 - growth cabinets
 - culture vessels, growth chambers, sterile containers, culture plates, flasks and bottles
 - autoclaves
 - positive filtration apparatus
 - auto pipettes and pipette pumps
 - cell counting chambers and a haemocytometer
 - incubators, including specialised atmosphere carbon dioxide
 - binocular light inverted microscopes
 - centrifuges
 - workplace procedures and standard methods.

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

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