



Australian Government

MSL973008 Perform histological procedures

Release: 1

MSL973008 Perform histological procedures

Modification History

Release 1. Supersedes and is equivalent to MSL973008A Perform histological procedures

Application

This unit of competency covers the ability to perform straightforward histological procedures involving processing and sectioning (by hand or rotary microtome) of plant and animal tissues in paraffin wax.

This unit of competency is applicable to laboratory assistants working in biomedical, biotechnology, environmental and education sectors. Personnel will work under direct supervision and have ready access to workplace procedures.

While no specific licensing or certification requirements apply to this unit at the time of publication, laboratory operations are governed by relevant legislation, regulations and/or external accreditation requirements. Local requirements should be checked.

Pre-requisite Unit

Nil

Competency Field

Testing

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

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

1	Assemble equipment and materials	1.1	Confirm the number and type of sections required
		1.2	Collect equipment and arrange the workspace so that equipment can be used safely and efficiently
		1.3	Perform pre-use and safety checks to ensure equipment is fit for purpose
		1.4	Report faulty or unsafe equipment to appropriate personnel
		1.5	Inspect processor reagents for deterioration and adequate

- volume, and report any items requiring replacement
- 2 **Process and embed plant and animal tissue**
 - 2.1 Select program and reagents for processing
 - 2.2 Monitor processor regularly during processing sequence to ensure dehydration, clearing and infiltration are complete
 - 2.3 Check that temperature of wax is suitable for embedding process
 - 2.4 Check that volume of wax is sufficient for uninterrupted embedding of processor load
 - 2.5 Embed tissue in correct orientation
 - 2.6 Allow block to solidify evenly according to wax requirements
 - 3 **Cut sections of plant and animal tissue**
 - 3.1 Place and secure block and knife in microtome strictly in accordance with safety directions
 - 3.2 Label required number of microscope slides in accordance with workplace traceability requirements
 - 3.3 Cut ribbons of representative sections at the required thickness observing prescribed safety measures
 - 3.4 Float sections onto water bath to flatten tissues
 - 3.5 Pick up sections onto microscope slides ensuring identification on slides matches that on block
 - 3.6 Apply procedures to prevent cross-contamination between samples
 - 3.7 Cut freehand sections of plant tissue as required
 - 3.8 Inspect sections and reject items that do not meet specifications
 - 4 **Stain sections**
 - 4.1 Select reagents specified in the method
 - 4.2 Stain sections according to the method

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| | | 4.3 | Examine sections microscopically to ensure expected staining outcomes have been achieved |
| | | 4.4 | Mount sections to ensure long-term preservation |
| | | 4.5 | Attach permanent labels giving specimen details according to workplace traceability requirements |
| 5 | Maintain a safe work environment | 5.1 | Ensure personal safety and minimise cross-contamination through the use of personal protective equipment (PPE) |
| | | 5.2 | Handle all specimens and equipment in accordance with workplace safety protocols/procedures |
| | | 5.3 | Clean up spills using appropriate techniques to protect personnel, work area and environment |
| | | 5.4 | Minimise generation of waste and environmental impacts |
| | | 5.5 | Collect and dispose of all wastes safely |
| | | 5.6 | Report hazards and incidents to designated personnel using workplace procedures |

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.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Standards, codes, procedures and/or workplace requirements

Standards, codes, procedures and/or workplace requirements include the latest version of one or more of:

- Australian and international standards covering the requirements for the competence of testing and calibration laboratories,

laboratory safety and quality management

- national work health and safety (WHS) standards and codes of practice, and national measurement regulations and guidelines
- specific codes, guidelines and procedures, such as National Association of Testing Authorities (NATA) accreditation requirements, principles of good laboratory practice (GLP), and Australian code of good manufacturing practice for medicinal products (GMP)
- workplace documents, such as standard operating procedures (SOPs); quality and equipment manuals; calibration and maintenance schedules; material, production and product specifications; production and laboratory schedules; stock records and inventory; workplace recording and reporting procedures; material safety data sheets (MSDS) and safety procedures; PPE requirements; indicators for use of biohazard and laminar flow cabinets; containment and clean-up of spillages; and waste minimisation and safe disposal procedures
- workplace procedures for processing, cutting and/or staining sections of plant and animal tissues in paraffin wax

Histological procedures

Histological procedures include, but are not limited to, one or more of:

- cutting paraffin sections of organs, such as kidney, liver, small intestine, stomach and tongue
- cutting paraffin sections of dicotyledon and monocotyledon stems
- staining tissue sections with haematoxylin and eosin (human and animal tissue) and safranin and fast green (plant tissue)

Workplace safety procedures

Workplace safety procedures include, but are not limited to, one or more of:

- use of biohazard containers and laminar flow cabinet
- correctly labelling reagents and hazardous materials
- use of PPE, such as gloves, safety glasses, goggles, faceguards, coveralls and gowns
- handling and storing hazardous materials and equipment in accordance with labels, MSDS, manufacturer instructions, and workplace procedures and regulations
- regularly cleaning and decontaminating equipment and work areas

WHS and environmental management requirements

WHS and environmental management requirements include:

- complying with WHS and environmental management requirements at all times, which may be imposed through state/territory or federal legislation. These requirements must not be compromised at any time
- applying standard precautions relating to the potentially hazardous nature of samples
- accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health, where relevant

Unit Mapping Information

Release 1. Supersedes and is equivalent to MSL973008A Perform histological procedures

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for MSL973008 Perform histological procedures

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Performance Evidence

Evidence of competence in this unit must satisfy all of the requirements of the elements and performance criteria, and include demonstration of:

- safely performing straightforward processing, sectioning (by hand or rotary microtome) and staining of at least three (3) different plant and animal tissue specimens in paraffin wax to clearly demonstrate the required tissue and/or cellular features
- consistently following workplace safety procedures and/or standard methods to process, embed, cut and stain animal and plant tissue
- performing pre-use equipment checks, including safety, serviceability, cleanliness and routine maintenance
- cutting sections at the specified thickness that are free of wrinkles, scores and folds
- staining sections of animal/human tissue and plant tissue using stains, such as regressive haematoxylin and eosin, and safranin and fast green
- cover slipping slides, ensuring that no air bubbles are formed to preserve the material for the life of the slide
- labelling slides clearly with case number, specimen and stain details
- managing tasks and organising work to ensure the timely completion of tasks
- using specimens, reagents and materials economically and disposing of wastes safely
- maintaining equipment and recording/reporting malfunctions appropriately
- minimising cross-contamination between specimens and contamination of the laboratory and environment
- maintaining traceability through all steps from receiving a specimen to completion of a procedure.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- nature of tissues, processing and sectioning methods used in job role
- functions of the components of a rotary microtome
- importance and appropriate use of certified reference materials
- relationship of the anatomy and morphology of tissue types and the macroscopic and microscopic appearance of stained sections
- correlation between poorly maintained processing reagents and resultant tissue blocks being difficult to cut or unsuitable for cutting

- relationship between correct orientation of the tissue during embedding and ability to cut sections from surface required for subsequent microscopic examination
- workplace and/or legal traceability requirements
- workplace procedures for safe collection and environmentally responsible disposal of wastes
- workplace safety procedures and precautions relevant to:
 - handling microorganisms and agents associated with human or animal tissue and fluids
 - handling irritating, volatile, flammable and potentially carcinogenic chemicals and stains, such as formaldehyde, xylene, histoclear, ethanol and chloroform
 - tissue processing, embedding and microtomy
 - aerosols
 - sharps and broken glassware.

Assessment Conditions

- Judgement of competence must be based on holistic assessment of the evidence. Assessment methods must confirm consistency of performance over time, rather than a single assessment event.
- This unit of competency is to be assessed in the workplace or a simulated workplace environment. A simulated workplace environment must reflect realistic operational workplace conditions that cover all aspects of workplace performance, including the environment, task skills, task management skills, contingency management skills and job role environment skills.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews (provided a record is kept in each case).
- This unit of competency may be assessed with:
 - MSL973007 Perform microscopic examination
- Holistic assessment methods include:
 - inspection of sections and slides prepared by the candidate
 - review of quality control records for sections and slides prepared by the candidate
 - feedback from supervisors and peers about the candidate's adherence to workplace/technical procedures
 - observation of the candidate performing tissue processing, embedding, cutting, pickup and mounting
 - oral/written questioning about workplace procedures covering safe processing and sectioning of plant and animal tissues and common quality issues.
- Access is required to instruments, equipment, materials, workplace documentation, procedures and specifications associated with this unit, including, but not limited to:

- a standard laboratory equipped with appropriate equipment, reagents, specimens and systems, such as:
 - tissue processors
 - microtomes and microtome knives (non-disposable or disposable), and microtome knife sharpeners
 - a processing system for paraffin blocks
 - flotation baths and drying ovens
 - reagents, such as formaldehyde, ethanol, xylene, paraffin and stains
 - reference material for automated and manual quality control and quality assurance systems
 - fresh and fixed specimens
 - computer information systems, databases, record and filing systems, including specimen accessioning
- workplace procedures and standard methods
- associated safety equipment, such as extractor systems.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- The assessor must demonstrate both technical competence and currency.
- Technical competence can be demonstrated through:
 - relevant VET or other qualification/Statement of Attainment AND/OR
 - relevant workplace experience.
- Currency can be demonstrated through:
 - performing the competency being assessed as part of current employment OR
 - having consulted with a laboratory about performing the competency being assessed within the last twelve months.

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