



Australian Government

Assessment Requirements for MSL975061 Perform molecular biology tests and procedures

Release: 1

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Modification History

Release 1. Supersedes and equivalent to MSL975034 Perform molecular biology tests and procedures. Changed title in prerequisite unit. Other minor changes in Performance Criteria, Performance Evidence and Knowledge Evidence.

Performance Evidence

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

- applied the following molecular biology procedures to biomolecules using small volumes, including:
 - extraction
 - isolation
 - purification
 - verification
 - manipulation
- amplified nucleic acids using PCR based technology
- applied at least 2 molecular biology multiple-step, small volume tests with appropriate controls to provide valid, reliable results from at least one of the following list:
 - tested samples for the presence of microorganisms
 - tested samples for the presence of biomolecules
 - cloning
 - sequencing
 - hybridisation
- followed work practices that prevent DNA/RNA contamination.
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Knowledge Evidence

There must be evidence the candidate has knowledge of:

- common molecular biology terms
- molecular biology principles and concepts underpinning tests and procedures, including:
 - DNA and RNA structure and function
 - protein structure and function
 - the relationship between chemical and physical properties of nucleic acids and proteins and the techniques used for sampling, preparation and testing
 - replication, transcription, translation

- relationship between structure, organisation and function of biomolecules to the storage of information in cells, chromatin, circular and linear chromosomes, RNA, genes and plasmids
- molecular genetics (molecular nature, organisation, function and regulation of genes)
- molecular mechanisms of DNA mutation and variation
- DNA transfer in prokaryotes (transformation, conjugation and transduction) and the use of plasmids
- restriction enzyme and ligase structure, nomenclature, function, specificity and stability, and cohesive versus blunt ends
- molecular biology procedures, including common:
 - extractions techniques
 - isolation techniques
 - purification techniques
 - verification and visualisation techniques
 - manipulation techniques
- different types of PCR assays
- preservation and storage of samples (e.g. freezing)
- purpose of tests and procedures implemented (why they are used and basic principle)
- use of enzymes in molecular procedures
- analysis of nucleic acids and proteins
- basic principles of cloning and sequencing
- general applications of molecular biology including:
 - testing DNA for sequence variation that is either causative of, or associated with, genetic disease
 - testing samples for the presence of microorganisms
 - identification of species
 - generating data for taxonomic and ecological investigations
 - genetic engineering
- importance of preventing and minimising DNA/RNA contamination
- handling of unstable or hazardous chemicals or samples and/or the fragile/labile nature of biological material
- importance and appropriate use of validated methods, controls and certified reference materials
- actions required when atypical data or results are identified
- basic ethical issues associated with biotechnology
- awareness of environmental sustainability issues as they relate to the work task
- legal and work health and safety (WHS) requirements specific to the work task including traceability, confidentiality and security requirements of all clinical 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:
 - a molecular biology laboratory equipped with appropriate test equipment, analytical instruments and reagents
 - workplace procedures, standard methods, manuals and supplier documentation, test results and documentation.

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

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>