

Title	Demonstrate and apply knowledge of microorganism biochemical pathways		
Level	5	Credits	6

Purpose	People credited with this unit standard are able to: explain microbial adenosine triphosphate (ATP) producing biochemical pathways; and perform biochemical tests for identification of microorganisms.
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Classification	Science > Microbiology
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Available grade	Achieved
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Guidance Information

- 1 All work must be carried out in accordance with the quality management system, documented protocol system or Standard Operating Procedures acceptable in a commercial or research laboratory.
- 2 Health and Safety practices must conform to Australian/New Zealand Standard AS/NZS 2243 – *Safety in Laboratories* Parts 1, 2, 3, 7 and 10 available at <http://www.standards.co.nz>.
- 3 Legislation applicable to this unit standard includes:
Health and Safety at Work Act 2015;
Hazardous Substances and New Organisms Act 1996.
- 4 Glossary
Anaerobic respiration refers to respiration in the absence of oxygen and includes fermentation.
Laboratory procedures refer to documented systems or processes of operation which may be found in a SOP manual, quality management system, or in protocol system documentation. These procedures are external and/or internal laboratory requirements governing laboratory work.
- 5 Recommended for entry: Unit 8040, *Perform aseptic laboratory techniques*; and Unit 26117, *Work safely in a science laboratory*.

Outcomes and performance criteria

Outcome 1

Explain microbial adenosine triphosphate (ATP) producing biochemical pathways.

Performance criteria

- 1.1 Microbes are explained in terms of their electron and carbon source in biochemical pathways.
- Range microbes include – chemolithotrophs, chemoorganotrophs, photolithotrophs, photoorganotrophs.
- 1.2 Autotrophs and heterotrophs are compared in terms of biochemical pathways.
- Range biochemical pathways include – photosynthesis, respiration.
- 1.3 Respiration is explained in terms of biochemical pathways.
- Range respiration includes – anaerobic, aerobic.
- 1.4 Inorganic electron donors for ATP generation are explained in terms of biochemical pathways.

Outcome 2

Perform biochemical tests for identification of microorganisms.

Range oxidase, catalase, oxidation-fermentation, methyl red, Vogues Proskauer, nitrate reduction, carbohydrate fermentation, citrate.

Performance criteria

- 2.1 Biochemical tests are carried out in accordance with manufacturer's instructions or laboratory procedures.
- 2.2 Test results are interpreted and documented in accordance with laboratory procedures.
- 2.3 Test results are related to the metabolic activity of bacteria.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	22 December 1996	31 December 2014
Review	2	24 February 1998	31 December 2014
Review	3	23 November 1999	31 December 2014
Review	4	21 May 2010	31 December 2025
Rollover	5	27 January 2015	31 December 2025
Review	6	27 September 2018	31 December 2025
Review	7	30 November 2023	31 December 2025

Consent and Moderation Requirements (CMR) reference	0113
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.