

CARRY OUT CYTOLOGICAL AND HISTOLOGICAL TECHNIQUES

UNIT CODE: APB/OS/AB/CR/01/6/A

UNIT DESCRIPTION

This unit specifies the competencies required to carry out cytological and histological techniques. It involves applying cell biology and applying cell division and growth. It also involves carrying out specimen collection and processing tissue samples.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function (to be stated in active)	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements (to be stated in passive voice) <i>Bold and italicized terms are elaborated in the Range</i>
1 Apply cell biology	1.1 Plant and animal cell structure is demonstrated as per laboratory procedures 1.2 <i>Solutions and apparatus</i> for cell physiology are prepared according to laboratory procedures 1.3 <i>Cell physiological processes</i> are carried out using <i>animal and plant tissues</i> as per laboratory procedures
2 Apply cell division and growth	2.1 Mitosis in plants and animals is demonstrated as per laboratory manual procedures 2.2 Meiosis in animal cells is demonstrated as per laboratory manual procedures
3 Carry out specimen collection	3.1 Live and dead plant and animal specimens are collected as per laboratory procedures 3.2 Live and dead plant and animal specimens are labelled as per laboratory procedures 3.3 Storage of specimen is carried out as per laboratory procedures 3.4 <i>Fresh tissue preparations</i> are carried out for microscopic examination as per laboratory
4 Process tissue samples	4.1 <i>Chemical fixation</i> of tissues is carried out as per laboratory procedures 4.2 <i>Tissue processing</i> is carried out based on laboratory procedures

	<p>4.3 Tissue sectioning is carried out as per laboratory procedures</p> <p>4.4 Staining of sections is carried out as per laboratory procedures</p> <p>4.5 Mounting of sections is carried out based on laboratory procedures</p>
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RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

VARIABLE	RANGE
Solutions and apparatus include but are not limited to:	<p>Solutions</p> <ul style="list-style-type: none"> • Hypotonic solutions • Hypertonic solutions • Isotonic solutions <p>Apparatus</p> <ul style="list-style-type: none"> • Visking tubings • Semi permeable membrane • Glass wares • Cork borers • Rulers
Cell physiological processes include but are not limited to:	<ul style="list-style-type: none"> • Osmosis • Diffusion • Active transport • Phagocytosis • Pinocytosis
Animal and plant tissues include but not limited to:	<ul style="list-style-type: none"> • Red blood cells • Onion epidermal cells • Potato tubers
Fresh tissue preparations include but not limited to:	<ul style="list-style-type: none"> • Squash • Touch (impression) • Apposition • Teased preparation
Chemical fixation includes but not limited to:	<ul style="list-style-type: none"> • Simple fixatives • Compound fixatives

Tissue processing includes but not limited to:	<ul style="list-style-type: none"> • Dehydration • Clearing • Impregnation • Embedding
Tissue sectioning includes but not limited to:	<ul style="list-style-type: none"> • Rotary microtomes • Freezing microtomes • Floating bath • Use of adhesives
Staining of sections include but not limited to:	<ul style="list-style-type: none"> • Preparation of stains • Staining procedures <ul style="list-style-type: none"> ○ Papanicolaou staining ○ Haematoxylin eosin
Mounting of sections includes but not limited to:	<ul style="list-style-type: none"> • Use of mountants <ul style="list-style-type: none"> ○ Resinous mountants ○ Aqueous mountants

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skill

- Maintenance
- Communication
- Interpersonal
- Analytical
- Critical thinking
- Problem solving
- First aid
- Innovation
- Creativity

Required Knowledge

The individual needs to demonstrate knowledge of:

- Cytological techniques
- Cell growth and division
- Histological techniques
- Specimen collection methods
- Storage of specimens
- Tissue processing

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1 Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Demonstrated plants and animal cell structure 1.2 Prepared solutions and apparatus for cell physiology 1.3 Carried out cell physiological processes 1.4 Demonstrated mitosis in plants and animals 1.5 Demonstrated meiosis in animal cells 1.6 Collected and labelled and stored live and dead plant and animal specimens 1.7 Prepared fresh tissue for microscopic examination 1.8 Carried out chemical fixation of tissues 1.9 Carried out tissue processing and sectioning 1.10 Carried out staining and mounting of sections
2 Resource Implications	The following resources should be provided: 2.1 Well-equipped biology laboratory 2.2 Laboratory procedures manual 2.3 Histological reagents and chemicals 2.4 PPEs
3 Methods of Assessment	Competency in this unit may be assessed through: 3.1 Oral 3.2 Written 3.3 Observation 3.4 Third party 3.5 Practical test

4	Context of Assessment	Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
5	Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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