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QUESTION

1. Write on purpose of fixation.
2. List 5 compound fixatives and composition.

ANSWERS

1. The purposes of fixation are:

i. Fixative usually acts to disable intrinsic biomolecules—particularly proteolytic enzymes—which otherwise digest or damage the sample.

ii. Fixative typically protects a sample from extrinsic damage. Fixatives are toxic to most common microorganisms (bacteria in particular) that might exist in a tissue sample or which might otherwise colonize the fixed tissue. In addition, many fixatives chemically alter the fixed material to make it less palatable (either indigestible or toxic) to opportunistic microorganisms.

iii. Fixatives often alter the cells or tissues on a molecular level to increase their mechanical strength or stability. This increased strength and rigidity can help preserve the morphology (shape and structure) of the sample as it is processed for further analysis.

iv. Fixatives denature proteins by coagulation, by forming additive compounds, or by a combination of coagulation and additive processes.

v. Fixative helps to kill the tissue so that postmortem decay (autolysis and putrefaction) is prevented.

vi. Fixation preserves biological material (tissue or cells) as close to its natural state as possible in the process of preparing tissue for examination.

2. 5 compound fixatives and their composition :

i. Zanker's solution- fixation time 4-24 hours.
Distilled water-950ml
Potassium dichromate - 25g
Mercuric chloride - 50g
Glacial acetic acid- 50g
Fixed tissue should be washed overnight in running tap water before processing.

ii. Bouin's fluid - fixation time 6 hours

Saturated aqueous solution of picric acid - 75ml
Formaline (-40% aqueous solution of formaldehyde) - 25ml
Glacial acetic acid - 5ml
Tissue fixed should be transfered to 70% alcohol.

iii. Formaline solution (10% buffered neutral) :
Formaldehyde (37-40%)- 100ml
Distilled water - 900ml
NaH_2PO_4 - 4.0g
NaH_2PO_4 (anhydrous) - 6.5g
Mix to dissolve.

iv. Formaline solution (10% unbuffered) :
Formaldehyde (37 - 40%)- 10ml
Distilled water - 90ml
Mix well.

v. Carnoy's fluid - fixation time 1-3 hours
Ethanol - 60ml
Chloroform - 30ml
Glacial acetic acid - 10ml
Fixer tissue should be processed immediately or transferred to 80% alcohol.