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Assignment on histopathology

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

Answer

- 1) The aim of fixation is to preserve cells or tissues in as near a life like condition as possible, prevent autolysis and putrefaction, and protect the tissue from subsequent processing. Fixatives have different actions e.g. crosslinking, precipitative, coagulative etc. In performing their protective role, fixatives denature proteins by coagulation by forming additive compounds or by a combination of coagulation and additive processes. Fixation of tissue is done for several reasons; **FIRSTLY**, to kill the tissue so that post mortem decay (autolysis and putrefaction) is prevented. Fixation preserves biological material (tissue or cells) as close to its natural state as possible in the process of preparing tissue for examination. **SECONDLY**, a 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 might otherwise colonize the fixed tissue. **FINALLY**, fixative

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. Standardization of fixation and other tissue processing procedures takes this introduction of artifacts into account, by establishing what procedures introduce which kinds of artifacts.

2i) Compound fixatives are the product of two or more simple fixatives mixed together to get combined effect of their properties.

5 compound fixatives with some types under them as follows:

- **Micro anatomical fixatives:** these are used to preserve the anatomy of tissue, some types of micro anatomical fixatives are: a) Formal saline b) Neutral buffer formalin c) Zenker's fluid d) Bouin's fluid.
- **Cytological fixatives :** these are used to fix intracellular structures a) Nuclear fixative:- Camoy's fluid, Clarke's fluid b) Cytoplasmic:- Champy's fluid.

Histochemical fixatives: these are used to demonstrate the chemical constituents of the cell. Some types of histochemical fixatives are: Cold acetone, Ethanol etc.

2ii) **COMPOUND COMPOSITION**

Compound	Compound composition
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Naphthalene methanol	7.70
Acetic acid	6.68
2,3 - Butanediol	6.46
Phenol	6.25
Andrographolide	4.56
5- Dodecyne	3.61
Pimaric acid	3.08
Ortho-formyl phenoxyacetic acid	2.80
Succinamic acid	2.78
Benzoic acid	2.66
Methyl beta -d- galactopyranoside	2.45
2- propanone ,1- hydroxy-	1.93
Trimethoxyvinyl silane	1.81
Androstane -3, 17-diol ,17-methyl-	1.59
Cycloxtane, (methoxymethoxy)	1.52
1,2- Benzenediol	1.44

Propane, 1-bromo-2-methyl-	1.34
Octadecatrienoic acid	1.19
1-pentyp-hexobarbital	1.13
Hydroquinone	1.12
1-Alanine, N-isobutoxycarbonyl-	1.01
butyl ester	Nil

1. Formalin solution (10%, unbuffered): formaldehyde (37-40%) - 10ml

Distilled water- 90ml

Mix well.

2. Formalin solution (10%, buffered neutral ;

Formaldehyde (37-40%) – 100ml

Distilled water - 900ml

NaH₂PO₄ – 4.0g

Na₂HPO₄ (anhydrous) – 6.5g

Mix to dissolve