18/MHS06/024

MED LAB SCI

MLS 202

ANSWER Q1

**Fixation** is the preservation of [biological tissues](https://en.wikipedia.org/wiki/Biological_tissue) from decay due to [autolysis](https://en.wikipedia.org/wiki/Autolysis_%28biology%29) or [putrefaction](https://en.wikipedia.org/wiki/Putrefaction). It terminates any ongoing biochemical reactions and may also increase the treated tissues' mechanical strength or stability. Tissue fixation is a critical step in the preparation of histological sections, its broad objective being to preserve cells and tissue components and to do this in such a way as to allow for the preparation of thin, stained sections. This allows the investigation of the tissues' structure, which is determined by the shapes and sizes of such macromolecules (in and around cells) as [proteins](https://en.wikipedia.org/wiki/Proteins) and [nucleic acids](https://en.wikipedia.org/wiki/Nucleic_acids)

In performing their protective role, fixatives denature proteins by coagulation, by forming additive compounds, or by a combination of coagulation and additive processes. A compound that adds chemically to macromolecules stabilizes structure most effectively if it is able to combine with parts of two different macromolecules, an effect known as cross-linking. Fixation of tissue is done for several reasons. One reason is to kill the tissue so that postmortem decay (autolysis and putrefaction) is prevented. Fixation preserves biological material ([tissue](https://en.wikipedia.org/wiki/Biological_tissue) or [cells](https://en.wikipedia.org/wiki/Biological_cell)) as close to its natural state as possible in the process of preparing tissue for examination. To achieve this, several conditions usually must be met.

First, a fixative usually acts to disable intrinsic biomolecules—particularly proteolytic [enzymes](https://en.wikipedia.org/wiki/Enzyme)—which otherwise digest or damage the sample.

Second, a fixative typically protects a sample from extrinsic damage. Fixatives are toxic to most common microorganisms ([bacteria](https://en.wikipedia.org/wiki/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.

Finally, 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](https://en.wikipedia.org/wiki/Morphology_%28biology%29) (shape and structure) of the sample as it is processed for further analysis.

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ANSWER Q2

(I) Zamboni/PAF

Composition; Paraforaldehyde, picric acid, NaOH, NaH2PO4

(II) Gendre Solution

Composition; Alcohol saturate with picric acid.

(III) Carnoy

Composition; Chloroform, acetic acid.

(IV) Bouin

Composition; Picric acid, Formaldehyde, acetic acid.

(V) Alcoholic Zinc Formalin

Composition; Zinc Chloride, DI, Isopropy; alcohol, formaldehyde