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## **FIXATION**

In the fields of histology, pathology, and cell biology, fixation is the preservation of biological tissues from decay due to autolysis or 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 and nucleic acids.

### **Purpose of Fixation**

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 or cells) as close to its natural state as possible in the process of preparing tissue for examination.

Second, 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 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 (shape and structure) of the sample as it is processed for further analysis.

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### **Compound fixatives and their composition**

**Bouin Solution** - 37-40% Formaldehyde, Picric Acid, Glacial Acetic Acid

**Gendre** - 37-40% Formaldehyde, 95% alcohol saturated with picric acid, Glacial acetic acid

**Hollande** - 37-40% Formaldehyde, Distilled water, Picric acid, Copper acetate

**Zenker and Helly** - Mercuric Chloride, Distilled water, Potassium Dichromate, Sodium Sulfate

**Orth** - 37-40% Formaldehyde, Distilled water, Potassium Dichromate, Sodium Sulfate