

Histocon

Description and Summary of Method:

It is a common practice to immediately place biopsies in a standard fixative, which limits the procedures available for examination of the tissue specimens. Tissues ideally fixed for optical microscopy may be totally inactivated for electron microscopy (EM). Autolytic changes or artifacts may occur during shipment of specimens to other laboratories. Histocon, a preservative transport medium, provides the flexibility for combined morphological and histochemical studies on the same tissue biopsy. With this medium, specimens are preserved at 0°C - +4°C, allowing the pathologist full choice of fixation without prior autolytic changes and without loss of components. With Histocon, wider applications of combined morphological and histochemical studies are available even with shipping specimens some distances.

Characteristics of Histocon:

1. Contains a membrane-stabilizing and cryoprotective agent.
2. Osmolality of 300m Osmol and pH similar to serum.
3. Inhibits bacterial growth and autolysis and maintains fresh tissue appearance.
4. Retains lipids and polysaccharides *in situ*.
5. Preserves proteins without denaturation and reduces risk of freezing damage.
6. Facilitates histochemical studies of tissue components and enzyme activities.
7. Histocon-preserved tissues may be embedded in resins without prior washing.

Advantages of Histocon:

Tissue samples are treated with Histocon and stored or transported at 0°C - +4°C (a Dewar vessel cooled with ice cubes). Specimens stored or in transit at 0°C - +4°C for **less than 24 hours** can be subjected to optical and electron microscopic studies as well as a full range of histochemical investigations. The cold microtome sections of the frozen specimens are then treated as if they represent new biopsies for subsequent evaluation. Specimens in transit between 24 and 48 hours at 0°C - +4°C may be subjected to morphological investigations under an optical microscope and to histochemical assays of enzyme activity. The results are comparable to those obtained with fresh frozen tissue.

Advantages of Room-Temperature Storage:

Continued histological investigations on frozen or paraffin-embedded sections and histochemical analysis of chemical components of the tissue are possible even though electron microscopy and enzyme histochemistry are not optimal. Since the specimen will not have been fixed immediately after removal, the use of Histocon allows the selection of the type of fixative, its concentration, temperature, pH, and the duration of fixation. These factors are of importance to assess the comparative aspects of histology. At ambient temperatures, the storage and transport time is less critical than that at 0°C - +4°C.

Limitations:

Excised tissue should not be transported for more than 48 hours in Histocon.

Usage:

Histocon solutions can be used directly for both cold microtomy and paraffin techniques without removal prior to mounting or embedding of the tissue. The use of cold solution allows enzyme-histochemical, chemical-constituent-histochemical and histological-morphological analyses to be performed in the same tissue specimen while room temperature solutions are used for histochemistry-histology.

For Enzyme-Histochemical Use:

Excised tissue is added to thoroughly chilled Histocon (20-50ml). The biopsy material is then stored in the refrigerator or is transported at 0°C - +4°C (Dewar vessel cooled with ice cubes) for histopathological examination. The specimen can be mounted and frozen on cryostat chunks without preceding the wash of the tissue. It should not be stored for more than 48 hours.

For Histochemistry-Histology Use:

Excised tissue is added to Histocon (20-50ml). The biopsy material can be paraffin embedded in the ordinary way, if cold microtomy is not required.

For Electron Microscopy Use:

When maintained at a temperature between 0°C and +4°C, biopsy specimens preserved in Histocon remain suitable for EM studies for 24 to 26 hours. The tissue is chilled in isopentane to the freezing point, in liquid nitrogen and then sectioned in a cryostat at -20°C under nitrogen. The resulting sectioned tissue samples may then be stored at -70°C. On the basis of optical microscopic examination, specimens of special interest are selected for EM examination. Sections as thick as 40 microns may then be thawed, fixed, and routinely embedded in resins without necessity of prior washing. In general, hydrolytic enzyme activities are retained in cellular organelles. A single biopsy specimen may be utilized for routine diagnosis as well as EM. The osmolality of Histocon seems to preserve the tissue sufficiently for EM in routine pathology. New cold microtome sections of the frozen specimen, which have been stored in the freezer, can repeatedly be subjected to further analysis.

Results:

Histocon-treated specimens exhibit extremely good retention of tissue components and prevent the development of autolytic change or artifacts in transported tissues. Transported Histocon-treated tissues, properly frozen, sectioned, and fixed, show no morphological defects in the electron microscope.

Specific Applications of Histocon:

Histocon has been shown¹ to preserve the morphology of skin grafts for 21 days as well as fresh-frozen sections, and to preserve the hydrolytic enzymatic activities. Other clinical reports² on the use of Histocon are for electron microscopy, oral giant cell granulomas,³ oral and skin epithelia,⁴ human gingiva,⁵ and urine cytology.⁶

Safety and Handling Precautions:

Danger! Poison! May be fatal if swallowed. **Do not drink.** Keep out of reach of children. If swallowed, induce vomiting by sticking finger down the throat, or by giving soapy or strong salty water to drink. Repeat until the vomit is clear. Never give anything by mouth to an unconscious person. Wash thoroughly after handling. Storage is nominally for one year, usually longer in tightly capped containers at 2°C - 4°C.

Ordering Information:

Cat. #	Description	Size
00582	Histocon	500ml

To Order:

In The U.S. Call: 1-800-523-2575 • 215-343-6484

In The U.S. FAX: 1-800-343-3291 • 215-343-0214

In Germany Call: (49) 6221-765767

In Germany FAX: (49) 6221-764620

References:

1. Eldh, J., Bartholdson, L., and Mobacken, H., *J. Plast. Reconstr. Surg.*, **8**, 202 (1974).
2. Arwill, T., Lilja, J., and Svensson, S.E., "Use of Histocon in Electron Microscopy", J.A.D.R. Annual Meeting in Arhus, Denmark, 1973, abstract.
3. Anderson, et al., *Acta Odontol. Scand.* (1973).
4. Magnusson, B.C., et al., *Histochemie*, **34**, 249-256 (1973).
5. Heyden, G., et al., *J. Oral Path.*, **1**, 12-21 (1972).
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