

### INTENDED USE

The ZEUS Tissue Fixative and Wash Solution is intended for transporting and processing fresh skin, kidney tissue, muscle, and benign or malignant lymphoid tissue when performing immunohistochemical examinations, and is for *In Vitro* diagnostic use only.

### SIGNIFICANCE AND BACKGROUND

Immunohistologic demonstration of tissue bound immunoglobulins and complement immune-complex deposits in fresh frozen tissue biopsies has proven to be a valuable diagnostic aid, particularly in the dermatology (1 - 4), and nephrology (5 - 8) disciplines. Immunohistochemical studies of skin and kidney biopsy tissues provide a valuable supplement to conventional clinical and histopathologic examination (9). In a number of skin disorders such as pemphigus vulgaris, bullous pemphigoid, cicatricial pemphigoid, and dermatitis herpetiformis, the immunologic findings may be specific for the disease (1 - 4, 9 - 12). In cases of discoid and systemic lupus erythematosus, immunohistochemical studies are important diagnostic aids (1). In addition, certain vascular skin disorders, lichen planus, and cutaneous expressions of various forms of porphyria yield immunohistochemical findings of special interest (1).

In spite of its apparent value, the demonstration of tissue fixed immune deposits by immunofluorescence or immunoperoxidase techniques has been impractical for routine use because frozen tissue was required. Physicians were discouraged from utilizing this important procedure due to the inconvenience and prohibitive logistics of shipping fresh frozen biopsy tissue to a reference laboratory (9).

With respect to kidney diseases, it is not quite clear that 85% of kidney disease presenting clinically as glomerulonephritis are due to some immunologic insult (5, 7 - 8). It is therefore imperative that immunohistochemical studies be included as part of all kidney biopsy evaluations. There are two basic mechanisms of immunologic insult to the kidney (8). One is characterized by antibodies directed against antigens comprising the glomerular basement membrane which produce a linear pattern of immunofluorescence in approximately 5% of the cases (8). The second is due to circulating antigen-antibody complexes that become trapped in the glomerular filter and produce a granular "lumpy-bumpy" staining pattern (8) in 80% of the cases. These immune-complexes may contain IgG, IgA, and IgM complement, and fibrin or fibrinogen in various combinations and staining patterns (5 - 8). A recent report (13) has shown the tissue fixative prepared according to Michel to be satisfactory for transporting both skin and kidney tissue biopsies.

### PRINCIPLE

The ZEUS Tissue Fixative and Wash Solution are designed to facilitate the transport and processing of fresh tissue biopsies obtained in the doctor's office or hospitals to suitable reference laboratories or other qualified laboratories where immunohistochemical analysis can be performed. The Tissue Fixative and Wash Solution are prepared according to the formulation described by Michel (9), with some modifications.

### COMPONENTS

**Tissue Fixative** (Product 0102): 12, 10mL, bottles of a proprietary modification of Michel's tissue fixative. Ready to use. pH 7.0 ± 0.2.

**Wash Solution** (Product 0103): 4, 120mL, bottles of a proprietary modification of Michel's tissue fixative. Ready to use. pH 7.0 ± 0.2.

**NOTE:** This fixative allows the transport of fresh tissue biopsies for up to 5 days at ambient temperature.

### PRECAUTIONS

1. For *In Vitro* diagnostic use.
2. If either the Tissue Fixative or Wash Solution forms insoluble crystals or salts, these vials should be discarded.
3. Do not allow vials of Tissue Fixative or bottles of Wash Solution to dehydrate prior to use.
4. Do not allow tissue to stick on edge of vial or in screw cap during fixation.
5. Do not freeze and thaw tissue before placing in the Tissue Fixative.
6. A low frequency of false negative results may occur if tissues are held in Michel's fixative for periods longer than 5 days (14).
7. NOTE FOR LABORATORIES: Wash and freeze specimens within 5 days or less of the "Use Date" noted on the vial by the sending physician.

### STORAGE CONDITIONS

	Tissue Fixative and Wash Solution
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### PROCEDURES

#### A. Instructions for Doctors:

1. Obtain desired tissue biopsy.
2. Open Tissue Fixative vial and submerge biopsy specimen into the fixative without delay.
3. Screw cap back on vial tightly.
4. The ZEUS Tissue Fixative should be used in conjunction with the ZEUS Wash Solution or its equivalent.

#### B. Procedure for Laboratories:

1. When the Tissue Fixative is received from the physician the contained tissue specimen should be carefully removed from the fixative and placed in the ZEUS Wash Solution.
2. Allow the tissue to wash for 30 minutes with frequent, gentle agitation in at least 20mL of the ZEUS Wash Solution.
3. Remove the tissue, blot excess wash solution, and snap freeze for subsequent cryostat microtome sectioning.
4. Cut sections and perform the requested immunohistochemical evaluations in the usual manor.
5. Report results to originating physician.

### RESULTS

It is not possible to predict the findings in biopsy tissue submitted for immunohistochemical evaluations. However, tissue handled according to the procedures of this insert should provide results comparable to those obtained with fresh, frozen tissues.

### LIMITATIONS

1. Tissue should not be held in the Tissue Fixative for more than 5 days, preferably less.
2. Tissue transported in the Tissue Fixative and washed in the Wash Solution may be fixed in formalin and processed for routine light microscopy. It should be noted however that the quality of the routine histology, although satisfactory, will not be equal to the morphological detail obtained from fresh formalin fixed tissue routinely processed in the histology laboratory.

3. No specific diagnosis is intended with the use of this product.

### EXPECTED RESULTS

The results of immunohistochemical studies of biopsy tissue processed in the Tissue Fixative are comparable to those obtained with fresh frozen biopsy tissue (9, 13).

### PERFORMANCE CHARACTERISTICS

The ZEUS Tissue Fixative and Wash Solution have been used and compared to fresh frozen biopsy tissues, including skin, kidney, muscle, benign and malignant lymphoid tissue specimens (9, 15). The comparative results are as follows: tissue biopsy specimens of skin, kidney, muscle, and temporal artery were evaluated. One half of each biopsy specimen was processed in the ZEUS Tissue Fixative and Wash Solution and the remaining half was snap-frozen immediately in liquid nitrogen. Those tissues placed in the Tissue fixative were held in the fixative for 10 days, washed, and then snap-frozen in liquid nitrogen. The results of both procedures using the direct fluorescent antibody procedure with monospecific antisera directed against human IgG, IgA, IgM, C3, and fibrinogen were similar in all the biopsy specimens' studies.

### REFERENCES

1. Cooperative Study: Arch. Dermatol. 111:371, 1975.
2. Burnham TK, Neblett RR, Fine VG: J. Invest. Dermatol. 41:451, 1963
3. Jordon RE, Beutner EH, Witebesky E, *et al*: JAMA 200:751, 1967.
4. Beutner EH, Cholzelski TP, Jordon RE: Charles C. Thomas, Springfield, IL, 1970.
5. Merrill JP: N. Engl. J. Med. 290:257, 1974.
6. Wilson CB, Dixon FJ: Third Edition, Ed. By KAK Black, Oxford, Blackwell Scientific Publications Ltd. Pp 275, 1972.
7. McClusky RT, Klassen J: N. Engl. J. Med. 288:564, 1973.
8. Wilson CB: Postgrad. Med. 54:157, 1973.
9. Michel B, Milner Y, David K: J. Invest. Dermatol. 59:449, 1973.
10. Beutner EH, Jordon RE: Proc. Soc. Exp. Biol. Med. 117:505, 1964.
11. Ueki J: Arch Dermatol. 100:610, 1969.
12. Michel B, Sy EK, David K, *et al*: J. Invest. Dermatol. 54:428, 1970.
13. Elias JM, Miller F, and Pastore J: J. Histo. Tech. 1:15, 1977.
14. Skeete MVH, and Black MM: Clin. Exp. Dermatol. 2:49, 1977.
- Giorno R: Am. J. Clin. Pathol. 78:8, 1982

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Tissue Fixative and Wash Solution (R2345)

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(Rev. Date 11/10/2025 AUS)