Use of Floor Polish in Mounting Sections for Light Microscopy

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Over the years a number of methods have been described to mount tissue sections on glass slides (for example see Humason 1979[1]). This paper presents a novel mounting medium that is inexpensive and readily available at the nearest grocery store - floor polish. This floor polish is available under a variety of trade names (e.g., Brite® and Future®, both from S.C. Johnson and Son, Racine, WI) labeled for use with "no-wax" floors. It has been found that this product is well suited to use as a mounting medium for both gelatin/albumin embedded sections as well as epoxy sections. The floor polish has demonstrated a much lesser degree of tissue distortion in some tissues as compared to the mounting media previously used in our laboratory, including Permount® (Fisher Chemical, Fair Lawn, NJ) and 30% sucrose in distilled H_2O.

Materials and Methods

The sciatic nerve of an adult rat was fixed in 4% paraformaldehyde and embedded in a mixture of gelatin and albumin. The tissue block was then hardened in the same fixative, rinsed in 0.1 M PO_4 buffer and cryoprotected with 30% sucrose solution in 0.1 M PO_4 buffer. Sections were cut at 40 mm with a cryostat. These sections were then stained with a monoclonal antibody series and reacted with horseradish peroxidase (these sections were part of a separate study and have incidentally been used as demonstrations for this paper). No other histological stains were used on these sections.

Cover slips were then attached to each of the dried slides using one of three mounting media: 1) Permount®, 2) 30% sucrose in deionized H_2O, and 3) Brite® floor polish. The sections to be used with Permount were air dried and then dehydrated through an ethanol (40% through 95%) and butyl alcohol (100%) series followed by a rinse in xylene. These sections were then immediately mounted with Permount®. The sections to be mounted with sucrose were air dried and then layered on 30% sucrose for 5 to 10 minutes and then mounted in 30% sucrose; The coverslips were sealed with dental wax. The sections to be mounted in Brite® were mounted by partially air drying and then mounting with the floor polish. Air drying the sections completely causes the sections to become temporarily opaque but has little effect on the overall tissue integrity in the final preparation. Partial air drying was used simply to avoid this opaque phase.

The mounting media were allowed to cure and the slides were then observed under standard light microscopy as well as with appropriate optics for both fluorescein and rhodamine fluorescent dyes.

Results & Discussion

As can be seen in figures 1a (Permount®) and 1b (sucrose), the tissue has undergone a dramatic distortion with large fractures forming within the nerve fiber bundle and the epineurium (connective tissue sheath) has pulled away form the outside of the bundle (arrows mark the boundaries of the displaced capsule). The section in figure 1c (floor polish) shows some fracturing of the bundle, but it is distorted to a far lesser degree than either the Permount® or sucrose and the epineurium has not been displaced.

Permount®, sucrose, and floor polish were also compared for autofluorescence when viewed under appropriate optics for fluorescein and rhodamine dyes. The Permount® medium yielded a high background autofluorescence, the sucrose a noticeable autofluorescence, and the floor polish negligible autofluorescence.

The floor polish mounting would appear to be quite stable over time. Slides containing gelatin/albumin sections have been stored for approximately two years and epoxy sections for approximately 30 months with no visible degradation of the floor polish medium. It should be noted that these times are in no way an end point; but simply reflect the results to date. In any case, floor polish is considerably more stable than sucrose which tends to begin drying out almost immediately.

Floor polish as a mounting media does suffer from at least two weakness: 1) since it is an aqueous solution, sections stained with water soluble dyes quickly become de-stained, and 2) the sections tend to migrate during the curing process, even if mounted on subbed slides, if warmed to speed curing. The latter problem can be compensated for, if necessary, by mounting sections individually under small cover slips.

Floor polish has been shown to be suitable for use as a mounting media with the following properties:

1. Tissue integrity (at least for those tissues examined) is considerably better maintained than with either sucrose or Permount®.
2. Background florescence is lower than either sucrose or Permount®.
3. *Since floor polish is a aqueous based medium it is suitable for use when a* medium containing organic solvents is not desirable.
4. Floor polish cures rapidly. If warmed at 70° C, the mounting is ready to be viewed within 20 to 30 minutes.
5. Mountings are stable over time.
6. Floor polish is inexpensive and readily available.

While only Brite® floor polish was thoroughly examined in this study, preliminary results indicate that Future® is equally suited. It is likely that many of the other brands of floor polish suitable for no-wax floors would also be suitable for use as a mounting medium.

It should be noted that neither the author nor family have any financial interests in S.C. Johnson and Son, Inc. Products used in this study was by chance.

1. Humason, G.L. 1979. Animal Tissue Techniques. Fourth ed. W.H. Freeman & Co. San Francisco, CA. 98-110.

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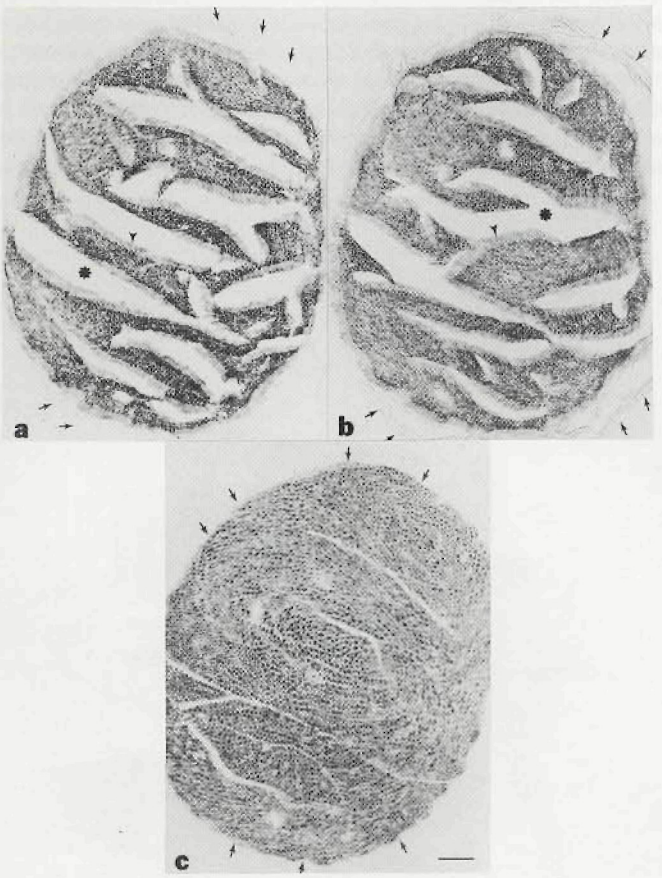
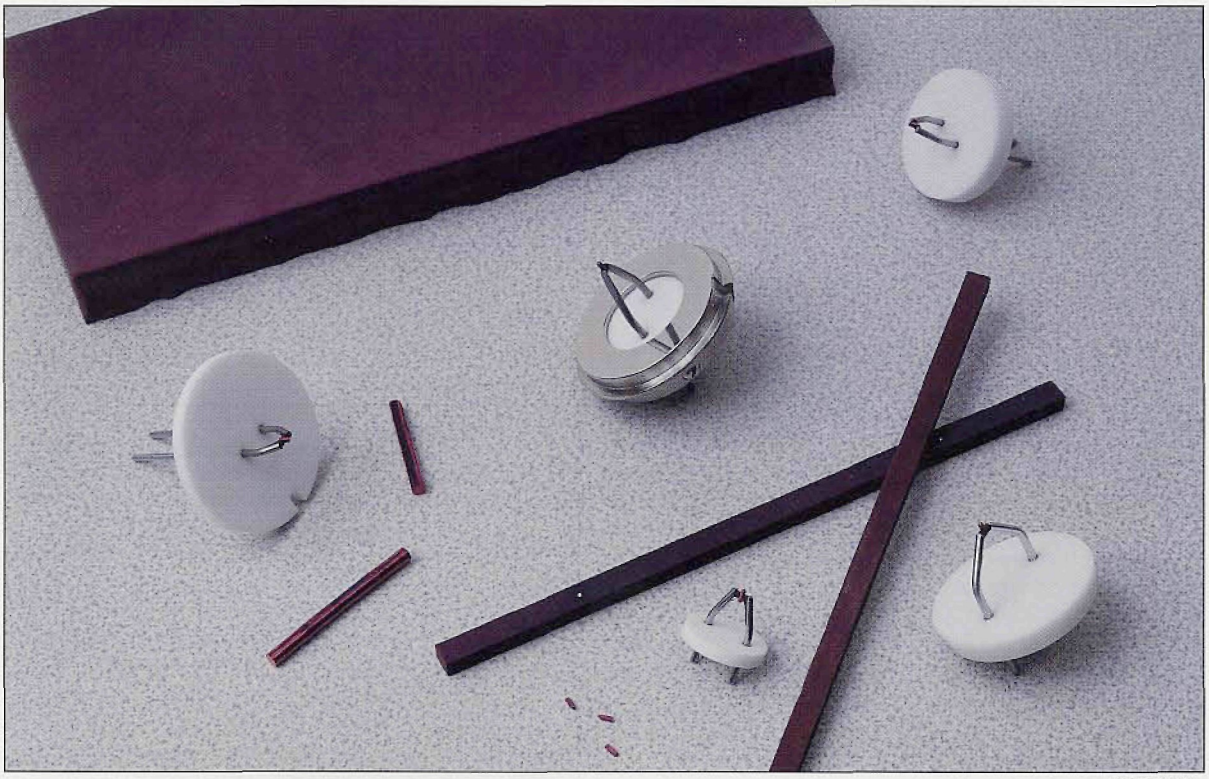


Firgure 1: Adult rat sciatic nerve, embedded in gelatin/albumin and reacted with substrate for horseradish peroxidase (HRP) after incubation with an antibody series the second of which was conjugated to HRP. Sections were mounted in Permount® (a), 30% sucrose (b) and Brite® floor polish (c). Large fractures seen in (a) and (bb) are absent in (c). Arrows mark the boundary of the epineurium that has been displaced from the nerve bundle during the mounting process. Representative fractures in (a) and (b) are marked with an asterisk. The columar structures lining the fractures (arrow heads) are sections of axons that have fallen and are now laying on their sides. The dark circular profiles seen in the sections are axons to which the monoclonal antibody has bound. No ther histological stain was uned on these sections. Scale bar = 100 µm.



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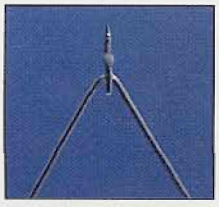

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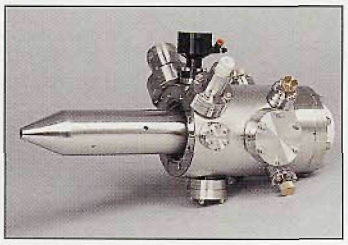

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