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Silver Stain for Electron Microscopy

The ammoniacal silver stain used for light microscopy has been adapted advantageously for use with the very thin biological sections required for electron microscopy. Silver staining for electron microscopy can be performed in 5 minutes or less, whereas conventional procedures require one-half hour or more. Also, because the silver stain has more contrast, it is especially useful for low-power electron microscopy. The staining procedure is performed in one or two steps. The first gives a good general brown stain, while the second provides more differentiation of color and some variation of electron density.

The silver stain is applied as follows: An ammoniacal silver solution is made by adding 10-percent silver nitrate solution to a small amount of ammonium hydroxide until a faint turbidity remains. The mixture is diluted with an equal amount of distilled water and put on a section which has been dried on a glass slide; alternatively, sections on a noncopper grid are floated on a few drops of the solution. In either instance, the sections are heated until a desired depth of color is obtained and then rinsed in distilled water. Any crystals of silver salt can be removed by rinsing with dilute ammonium hydroxide. For more differentiation of color, diluted ammoniacal silver solution is mixed with dilute formalin (1 drop of 37% formaldehyde in about 150 ml of water) and applied to the sections. Development of the desired intensity of color can be observed through the light microscope.

The ammoniacal silver solution stains much the same structures as the usual stains used for electron microscopy. In light microscopy, great detail can be seen in biological sections because of the various shades of the stain ranging from yellow to reddish brown to black; nuclear membranes, nucleoli, mito-

chondria, and connective tissue are well defined.

The modified stain can be used effectively when it is necessary to correlate observation made by light and electron microscopy. For example, thin sections can be stained with silver on a glass slide and compared with immediately adjacent thin sections on grids stained by the conventional procedure for electron microscopy. Observation can be made in both the light and electron microscopes of silver-stained thin sections on stainless steel grids. Both electron and light microscope images can be compared with adjoining sections prepared with the usual stains for electron microscopy. These correlations permit better comparison of ultrastructures than can be made by the usual thick- and thin-section correlations.

Reference:

Corbett, R. L.: Modification for Electron Microscopy of the Corbett Ammoniacal Silver Stain. 29th Annual Proceedings, Electron Microscopy Society of America, Boston, Massachusetts, 1971.

Note:

No additional documentation is available. Specific questions, however, may be directed to:

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No patent action is contemplated by NASA.

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