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**COMPOSITION FOR FIXING AND PROTECTING
A SMEAR OF BODY CELLS AND METHOD OF
APPLYING SAME**

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10 Claims

ABSTRACT OF THE DISCLOSURE

Cytological fixative and protective composition that includes a liquid solution of an alcohol, water, a polyalkylene glycol, and a ketone. The composition may also contain a dye.

This invention relates to a novel cytological fixative and protective composition, and to a method for applying such composition. More particularly, this invention relates to the treating of a slide having thereon a smear of body cells for microscopic examination, so as to fix and preserve the cells for such examination, and involves depositing on the slide a composition comprising an alcohol, water, a polyalkylene glycol, and a ketone.

It is conventional practice to place a smear on a slide and examine it under a microscope. If such a smear is permitted to dry in the air, the cells generally are not suitable for obtaining a clear picture under the microscope. To avoid drying of the smear, various fixative compositions have been applied. Thereafter, a protective coating has been applied in order to protect the surface of the smear.

It is an object of the present invention to provide a novel and improved cytological fixative and protective composition.

Another object is to provide a method of simultaneously fixing the specimen on the slide and protecting it with a coating, the fixing and protecting being effected in a single step, whereby the slide may then be handled without damaging the specimen.

Additional objects and advantages will become apparent from the following detailed description.

In accordance with one aspect of our invention, there is provided a cytological fixative and protective composition comprising an alcohol, water, a polyalkylene glycol, and a ketone.

The alcohol functions as a fixative and advantageously contains from about 1 to 10 carbon atoms, such alcohols as methanol, ethanol, and isopropanol being preferred. We have found that particularly desirable results are obtained using isopropanol.

The polyalkylene glycol serves as a fixative and also remains as a residual film on the surface of the slide, thus serving to protect the smear. The polyalkylene glycol should have a molecular weight of from about 1000 to 4000. We have found polyethylene glycol to be especially advantageous because it is non-toxic as well as water soluble. Accordingly, when the smear is to be subjected to microscopic examination, the protective polyethylene glycol film is easily removed by treatment with an aqueous liquid.

The ketone functions as a fixative and additionally enables the overall composition to rapidly penetrate the smear. This is highly advantageous, because the cells should be fixed while still fresh and moist, that is, before appreciable drying has occurred. Otherwise, changes in morphology invariably occur.

The ketone may be represented by the formula

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wherein R_1 and R_2 may be alkyl containing from about 1 to 10 carbon atoms, aryl such as e.g. phenyl or naphthyl, alkaryl, or aralkyl. The preferred ketone is acetone.

The preferred proportions for our fixative-protective composition are as follows:

Water-alcohol—100 cc.
Polyalkylene glycol—1–50 gm.
Ketone—5–50 cc.

The amount of water in the water-alcohol mixture may be from about 4 to 80 cc., with the amount of alcohol being correspondingly from about 96 to 20 cc. If desired, a minute amount of a dye may also be incorporated.

The foregoing liquid composition is desirably applied in dropwise manner to the slide to thereby cover the smear, e.g., by means of a dropper applicator, by spraying, or the like. Alternatively, the composition may be caused to flow over the slide surface, provided that care is taken to prevent any portion of the cells of the specimen from being washed off. Upon covering the smear, the slide is permitted to dry. This serves to fix the cells, while at the same time an appreciable proportion of the volatile constituents of the composition, e.g., the alcohol and ketone, will evaporate off, thereby leaving a protective film residue made up primarily of the polyethylene glycol. The slide may now be handled without damage to the specimen.

When the smear is to be subjected to microscopic examination, the film is readily removed by washing with an aqueous liquid, e.g., water.

The following example will further illustrate our invention.

EXAMPLE

The following formulation was prepared:

Ingredient:	Amount
Isopropyl alcohol -----cc--	90
Water -----cc--	10
Polyethylene glycol (Molecular weight of about 1540) -----g--	5
Acetone -----cc--	20
Dye (toluidine blue) -----cc--	0.01

The polyethylene glycol readily dissolved so that the overall formulation was a liquid solution.

The foregoing solution was applied to a slide having thereon a freshly prepared smear of body cells. The application was dropwise by spraying the solution onto the slide surface so as to completely cover the smear. The slide was allowed to dry, thereby fixing the cells and leaving a protective film of polyethylene glycol covering the smear. It was found that the slide could then be handled and/or stored without damage to the smear.

The slide subsequently was prepared for microscopic examination by washing with water to thereby dissolve and remove the polyethylene glycol protective film. Microscopic examination showed the cells of body tissue to exhibit a high degree of transparency, with no change in morphology.

Variations can of course be made without departing from the spirit of the invention.

Having thus described our invention, what we desire to secure and claim by Letters Patent is:

1. A cytological fixative and protective composition comprising a liquid solution of an alcohol containing from about 1 to 10 carbon atoms, water, a polyalkylene glycol having a molecular weight of from about 1000 to 4000, and acetone, the proportions being, per 100 cc. of alcohol-water, from about 1 to 40 grams of said polyalkyl-

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ene glycol and from about 5 to 50 cc. of acetone, the proportions of said alcohol-water being from about 20 to 96 cc. of alcohol and correspondingly from about 80 to 4 cc. of water.

2. The composition of claim 1 wherein said alcohol is isopropyl alcohol, and said polyalkylene glycol is polyethylene glycol.

3. The composition of claim 1 wherein there is additionally present a dye.

4. The composition of claim 3 wherein said dye is toluidine blue.

5. A method of treating a slide having thereon a smear of body cells for microscopic examination, comprising depositing dropwise on said slide a composition comprising a liquid solution of an alcohol containing from 1 to 10 carbon atoms, water, a polyalkylene glycol having a molecular weight of from about 1000 to 4000, and acetone, the proportions being, per 100 cc. of alcohol-water, from about 1 to 50 grams of said polyalkylene glycol and from about 5 to 50 cc. of acetone, the proportions of said alcohol-water being from about 20 to 96 cc. of alcohol and correspondingly from about 80 to 4 cc. of water.

6. The method of claim 5 wherein said alcohol is isopropyl alcohol, and said polyalkylene glycol is polyethylene glycol.

7. The method of claim 5 wherein there is additionally present a dye.

8. The method of claim 7 wherein said dye is toluidine blue.

9. The method of claim 5 wherein said dropwise deposition is by spraying.

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10. The method of claim 5 wherein after said dropwise application said slide is permitted to dry whereby the volatile constituents of said composition evaporate to thereby leave a residual protective film of said polyalkylene glycol and treating said slide with a aqueous liquid prior to microscopic examination to thereby dissolve said film.

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