A NEW METHOD FOR DETECTING ACTIVATED AND NEOPLASTIC MESOTHELIAL CELLS IN SEROUS EFFUSIONS[1]

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Histochemical methods for identifying mesothelial cells, either in serous fluids or in tissue specimens, have been proposed by many authors (Berge & Gröntoft, 1965; Fisher & Hellstrom, 1960; Kannerstein et al., 1973; Spriggs & Boddington, 1968; Wagner et al., 1962). Butler & Berry (1973), reviewing the most notable contributions to the cytology of malignant mesotheliomas, concluded that special stains do not contribute to the diagnosis.

In a previous short report, one of the authors (Donna, 1976) described the phenomenon which is considered here in greater detail. This diagnostic method is based on a feature specific to mesothelial activated and neoplastic cells but not to metastatic mucus-producing cells in effusions. Cells are observed in the phase contrast microscope after staining by Papanicolaou's method, treatment with 95% ethyl alcohol and staining by the periodic acid-Schiff method, according to McManus (1946), as modified by Lillie (1951) and further modified by a longer treatment with Schiff's reagent. The full procedure is as follows:

[1] A more detailed report is in press in *Pathologica*.

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Absolute ethyl alcohol: 5 dips (8-10 sec)
- 90% ethyl alcohol: 5 dips (8-10 sec)
- Distilled water: 5 dips (8-10 sec)
- 0.5% aqueous solution of periodic acid: 6 min
- Distilled water: 5 dips (8-10 sec)
- Feulgen's reagent: 6 min
- 2% aqueous solution of sodium metabisulfite: 3 min
- Running tap water: 3 min
- Distilled water: 5 dips (8-10 sec)
- Carazzi's haematoxylin: 4-5 mi
- 5% aqueous solution of lithium carbonate: 2 min
- 50% ethyl alcohol: 5 dips (8-10 sec)
- 80% ethyl alcohol: 5 dips (8-10 sec)
- 90% ethyl alcohol: 5 dips (8-10 se)
- Absolute ethyl alcohol: 5 dips (8-10 sec)
- Xylol: 5 dips (8-10 sec)
- Xylol: 5 dips (8-10 sec)
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- Xylol: 5 dips (8-10 sec)
- Clear and mount for examination in the phase contrast microscope.

The distinctive feature shown by mesothelial activated or neo-
astic cells consists of bright blue cytoplasmic granules and masses of
fferent sizes. Metastatic neoplastic cells, even those from mucus-
oducing carcinomas, display a greyish, orange or violaceous colour in
eir cytoplasm.

The material studied consisted of serous fluid from 300 cases of
tastatic mucus-producing carcinomas and from 20 cases of malignant
sotheliomas, diagnosed on histological examination of large tissue
ecimens from thoracotomies and confirmed at necropsy in seven cases.
reover, histological diagnoses were confirmed by a review of the
ides by members of the Commission of the European Communities Meso-
elioma Panel.

The phenomenon was displayed by all of the fluid specimens from the
cases of mesothelioma, and it was absent in all of the fluid specimens
om the 300 cases of serous metastatic tumours.

The chemical basis of the phenomenon is being investigated.
wever, it appears to depend on the presence in the activated and
plastic mesothelial cells of a diastasis-resistant and partially
luronidase-resistant substance. In our opinion, this could be a
coprotein, which is probably modified by the hydrochloric acid of
anicolaou's stain. Nevertheless, this pattern of staining appears
be distinctive for mesothelial cells, and its diagnostic value was
nfirmed in the large collection of fluid specimens on which it was
ted.

We therefore propose to adapt this method to cytological diagnosis, since it is simple and could be tested on a larger series than ours in order to confirm its usefulness.

SUMMARY

A new method is proposed for identifying neoplastic mesothelial cells and for distinguishing them from neoplastic metastatic cells in fluids of serous effusions.

RESUME

Les auteurs proposent une méthode nouvelle pour identifier les cellules mésothéliales néoplasiques et les distinguer des cellules métastatiques néoplasiques dans les liquides d'épanchements séreux.

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