

of patients studied indicates that dividing elements belong to lymphoid cell line and are, as in infectious mononucleosis, the atypical circulating lymphocytes. The number of detected metaphases seems not to be related to age and sex of the subjects studied, and a precise linkage with the treatment could not be demonstrated.

The significance of the presence in schizophrenia of circulating cells spontaneously capable of undergoing mitosis is still questioned, but our findings allow us to suppose that the abnormal peripheral lymphocytes present in this disease are blast-transformed cells.

The presence of 'atypical lymphocytes', like those detected in schizophrenia and in infectious mononucleosis, in several other disorders^{12,13}, suggests that mitoses in short-term peripheral blood cultures can be found in other pathological conditions in which circulating 'reactive lymphocytes' are present¹⁴.

Riassunto. Vengono riportati i risultati di una ricerca che dimostra come preparazioni cromosomiche dirette praticate su sangue periferico di schizofrenici contengano mitosi in quantità sensibilmente superiori a quelle evidenziabili con lo stesso metodo in soggetti di controllo.

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On the Biogenic Amines in the Carotid Body: Identification of Dopamine by Mass Spectrometry

In connection with investigations on the fine structure of the carotid body, it was of interest to identify the biogenic amines, which should be localized in electron-opaque cored vesicles of the glomus cells. These osmophilic granules show under various experimental conditions¹⁻⁴ differences in numbers, size, and density. Unfortunately, controversial results exist both about the kinds and the amounts of the biogenic amines⁵⁻⁷. This might be due to the methods applied, such as histochemical techniques, fluorescence microscopy, and pharmacological tests. It is difficult to exclude errors under these experimental conditions. Therefore, an attempt was made in initial experiments to identify biogenic amines in the carotid body by a combination of chromatographic and spectrometric methods^{8,9}.

Materials and methods. The common carotid bifurcations from 30 healthy horses were removed within 3 min after death. The horses had been killed by a shot in the head. The bifurcations were frozen in dry ice/ethanol. The fine preparation of the carotid bodies from the connective tissues was done under an operation microscope. During the chemical investigation, a microscopical survey of small pieces of the extirpated tissues was made to test whether only carotid body cells had been removed.

For the chromatographic separation, the biogenic amines of the carotid bodies were treated with 1-dimethylaminonaphthalene-5-sulphonyl chloride (dansyl chloride) in the presence of an excess of sodium hydrogen carbonate¹⁰. Thus, each carotid body was immersed in a solution of 25 mg of dansyl chloride in acetone/water =

2/1 (v/v), and homogenized in the solution. After 2 days, the reaction medium was filtered, the acetone removed in vacuo, and the dansyl derivatives extracted with ethyl acetate. After separation by thin-layer chromatography on silica gel G MERCK (solvent systems: ethyl acetate/cyclohexane = 3/2; benzene/triethylamine = 5/1), the dansyl derivative of dopamine was identified as one of the main components (Figure). The fragmentation mechanism was reported recently⁹. The question whether the biogenic amines are localized in some or all electron-opaque cored vesicles, could not be solved by these experiments. It was for instance, shown recently by CHIOCCHIO et al.⁶ by electron microscopy, using a special

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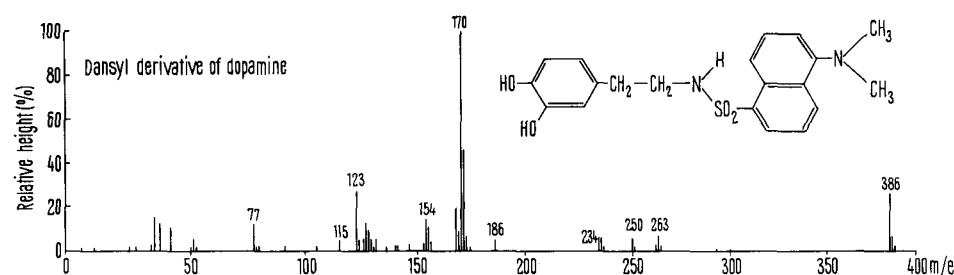
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Mass spectrum of the dansyl derivative of dopamine, isolated from the carotid body of the horse (Hitachi-Perkin Elmer RMU-6D mass spectrometer, direct inlet, 70 eV, 365 °C).

glutaraldehyde-silver technique, that the glomus cells are of 3 different types, one containing 5-hydroxytryptamine, one noradrenaline, and one adrenaline. The localization of the L-DOPA metabolites is studied at present by tracer technique.

It was therefore of interest for this investigation to determine whether the biogenic amines in the carotid body of other animals were similar to those of the horse. This could be demonstrated on the carotid body of the rabbit by thin-layer chromatography using the same technique as described above. Also, the increase of some amines after intraperitoneal application of a MAO-blocker (Pargylin) was obvious.

Zusammenfassung. Die biogenen Amine aus dem Glomus caroticum vom Pferd wurden mit Dansylchlorid umgesetzt. Nach chromatographischer Vortrennung konnte Dopamin als eine der Hauptkomponenten massenspektrometrisch identifiziert werden.

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Aberrant Nerve Fibres in Embryos Treated with Thiopental

The problem of the factors which determine the orientation of nerve fibres in growth has not been solved even though there have been many attempts to do so. There are two large fields of thought on this problem: a mechanical theory which maintains that the direction in which the fibres grow is determined by preestablished routes^{1,2}. The other theory is neurotropic and it claims that the orientation of the nerve fibres is determined by specific substances³⁻⁵. The experimental production of aberrating nerve fibres may help to clarify the problem.

Material and methods. To the embryos of chickens between the 10th and 15th periods⁶ we injected thiopental⁷ in one dose of 1.5 mg. Between the 8-12 days, the embryos were sacrificed and studied histologically. The dye used was hematoxylin-eosin and the Bodian technique.

Observations. Besides the other alterations⁸ we have observed in a great number of embryos aberrating nerve fibres after treatment. The most frequent of these are those bundles which invade the ventricular cavities. In some cases the bundles terminate freely in the ventricular cavity (Figure 1); it is in this free extremity that nuclei of the nerve fibres lie. In other cases, the fibres penetrate the opposite wall after crossing the ventricular cavity (Figure 2). We have also been able to observe how fibres bundles penetrate the cartilage of a future vertebrate body.

Our observations appear to refute the theories supporting the growth of nerve fibres in homogeneous me-



Fig. 2

diums. The appearance of aberrant nerve fibres, because of treatment with thiopental, could be due to an abnormal reaction of the nerve fibres to a normal growth stimulus, or to an agitation in the synthesis, and/or distribution of the orientating growth substance.

Resumen. Embriones de pollo tratados con pentotal sódico muestran fibras nerviosas que penetran en las cavidades ventriculares, lo que parece apoyar las teorías quimotropicas sobre la orientación de las fibras nerviosas en crecimiento.

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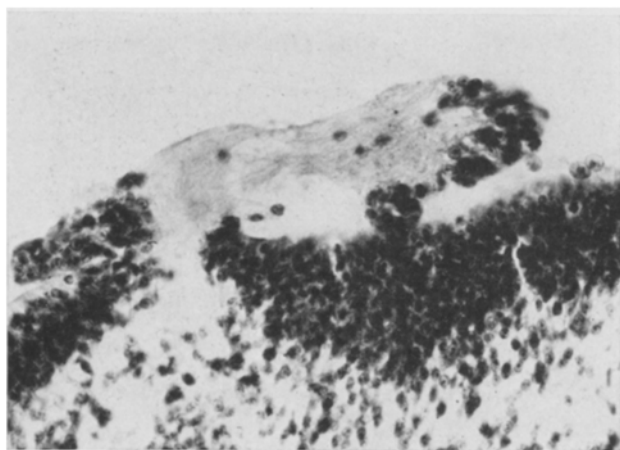


Fig. 1

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