

## Autoradiographic Studies on the Distribution of Tritium Labeled Decamethonium in the Chicken CNS

Uptake of labeled decamethonium in vivo in the CNS of the young chicken has recently been reported<sup>1</sup>. In the present investigation, sites of radioactivity in tissues from the chicken CNS have been localized histologically using the technique of autoradiography.

Three- to five-day-old chickens each received a total i.p. dose of 1.7 mg/kg tritiated decamethonium diiodide given in divided doses over a period of 7 h. Animals were decapitated 17 h after the last injection and the brain removed and frozen on solid carbon dioxide. Coronal sections 8–10  $\mu$  thick were cut in a cryostat and autoradiographs prepared on Ilford K5 10  $\mu$  thick emulsion coated slides. The autoradiographic technique was similar to that described by APPLETON<sup>2</sup>. Following exposure and development of the emulsion, sections were stained with cresyl violet-acetate and examined using transmitted light and dark-field microscopy.

High grain densities were noted in the emulsion underlying the pia-arachnoid of all the sections examined. Occasionally, distinct separation of pia and arachnoid occurred adjacent to cerebral vessels; the arachnoid passed superficial while the pia passed deep to these vessels. Numerous grains underlay the arachnoid although the pia and vessel walls were associated with background grains only (Figure 1).

In the junctional region between dorsal and medial surfaces, the arachnoid continued onto the opposite cerebral hemisphere and the medial surfaces were covered by pia mater alone. The grain density under the arachnoid remained high although the pia and subjacent cerebral tissue of the medial surfaces presented background grain counts. In autoradiograms of single hemispheres, an abrupt reduction of grains corresponded to the position of detachment of the arachnoid (Figures 2 and 3).

In addition to high grain counts beneath the arachnoid (or pia-arachnoid in areas where positive histological identification proved inconclusive), the choroid plexuses were sources of high radioactivity. Grain counts related to other cerebral tissues (neurons, glial cells, vascular elements, ependyma etc.) were similar to those due to background contamination of the emulsion. Possible arti-

facts caused by positive and negative chemoradiography were eliminated by means of routine control procedures.

The results of this study indicate high levels of radioactivity distributed throughout cells in the arachnoid and the choroid plexuses. Within the limits of the present techniques, radioactivity could not be detected in other CNS tissue elements<sup>3</sup>.

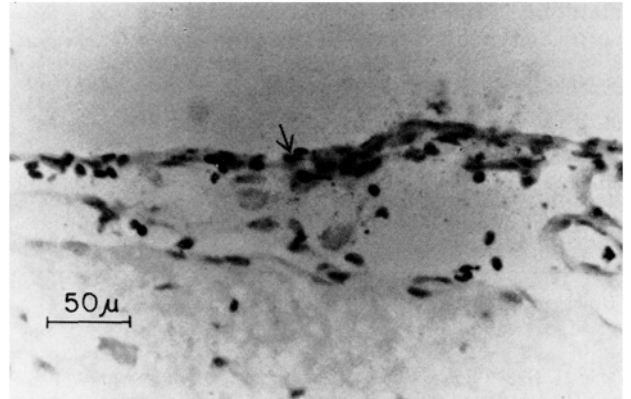


Fig. 2. Junctional region of the dorsal and medial surfaces of a single cerebral hemisphere. Detachment of the arachnoid occurred in the region indicated.

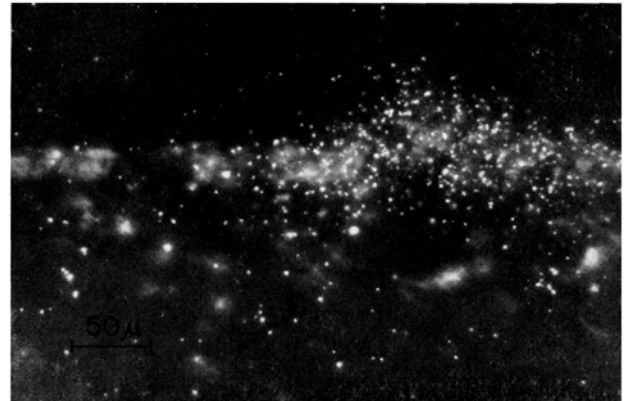


Fig. 3. Dark field illumination of Figure 2.

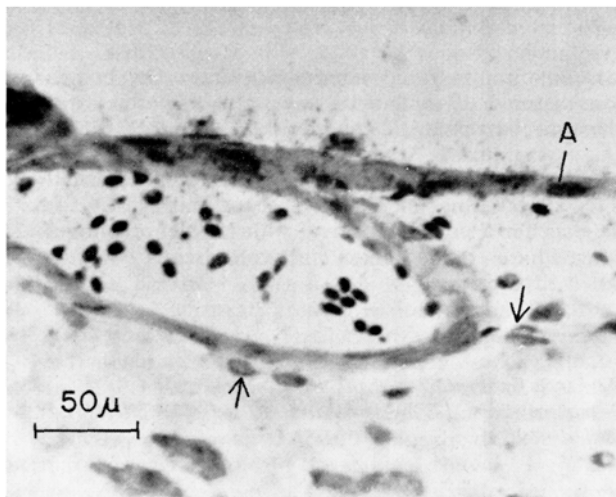


Fig. 1. Autoradiograph of a coronal section through the dorsal surface of the chick cerebral hemisphere showing high grain densities related to the arachnoid (A). The pia (arrowed) and subjacent nervous tissue are devoid of radioactivity.

*Zusammenfassung.* Die Verteilung von mit Tritium markiertem Decamethonium im Zentralnervensystem von Küken wurde untersucht. Zellen des Arachnoid- und Choroidplexus enthielten grosse Mengen Radioaktivität.

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<sup>1</sup> T. C. LU, J. A. GOSLING and D. B. TAYLOR, Eur. J. Pharmac., in press.

<sup>2</sup> T. C. APPLETON, J. R. microsc. Soc. 83, 277 (1964).

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