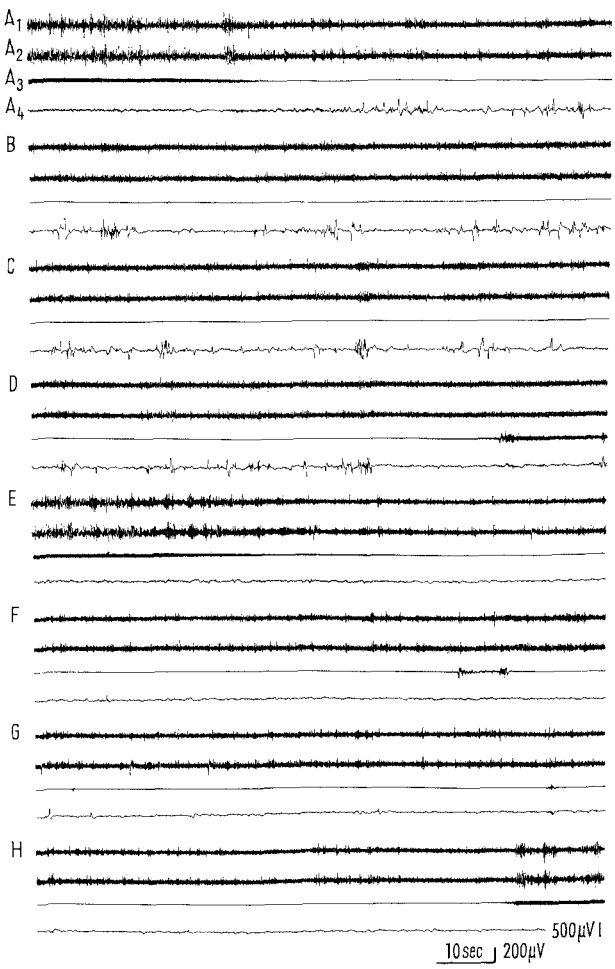

Abolition of the bursts of rapid eye movements during desynchronized sleep following vestibular lesions. Unrestrained, unanaesthetized cat. 1, left parieto-occipital; 2, right parieto-occipital; 3, EMG from posterior cervical muscles; 4, ocular movements (electro-oculogram). A–D, episode of desynchronized sleep recorded in the intact animal 4 days following chronic implantation of the electrodes. Note the occurrence of large bursts of rapid eye movements when the EMG becomes silent. E–H, episode of desynchronized sleep recorded in the same animal 2 days following a chronic bilateral lesion of the medial and descending vestibular nuclei. Calibration of 500 μV applies only to channel 4, calibration of 200 μV applies to channels 1–3.

preparations was characterized simply by desynchronized electrocortical activity and by complete relaxation of the posterior cervical muscles. The abolition of the REM during desynchronized sleep was not a transient phenomenon, but persisted throughout the survival period (up to 23 days).

Control experiments showed that the REM were still present following complete cerebellectomy and/or bilateral section of the VIII nerve. The changes which have been observed are therefore due to destruction of second-order vestibular neurones.

The effects described above were seen when the lesion was symmetrical and affected completely the vestibular nuclei of both sides. Bilateral electrolytic lesions limited to the medial and descending vestibular nuclei were also equally effective (Figure). Unilateral lesion of the vestibular nuclei or bilateral lesion limited to the superior and lateral vestibular nuclei, however, did not prevent the appearance of the bursts of REM.

It is of interest that in the intact animal the activity of the units recorded from the superior and lateral vestibular nuclei remains unmodified during desynchronized sleep, while the units in the medial and descending vestibular nuclei show bursts of rapid discharge synchronous with the bursts of REM[4].

The present experiments show that the medial and descending vestibular nuclei are of critical importance for the appearance of rapid eye movements during desynchronized sleep.

Riassunto. I movimenti rapidi oculari caratteristici del sonno desincronizzato nel gatto dipendono dall'integrità anatomica e funzionale dei nuclei vestibolari.

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PRO EXPERIMENTIS

A Method for Revealing Inhibition of Virus-Induced Synthesis of RNA

In the search for virus-specific inhibitors various methods of testing are applied, a plaque assay method being most often used[1]. This method enables the determination of the rate of inhibition by a given compound of virus production, which is composed of cell-specific and virus-specific synthetic processes. It is, however, important to measure the inhibition of virus-induced synthesis, particularly the synthesis of viral nucleic acids.

It was established that the synthesis of cellular RNA is dependent on DNA while the synthesis of viral RNA in one-stranded RNA viruses is determined by viral RNA itself[2]. However, the revelation of the synthesis of viral RNA is difficult, because the rate of the latter is considerably lower than the rate of the synthesis of cellular RNA. Therefore actinomycin D (C_1), which inhibits the synthesis of DNA-dependent RNA and does not inhibit the synthesis of viral RNA[3], can be used in experiments

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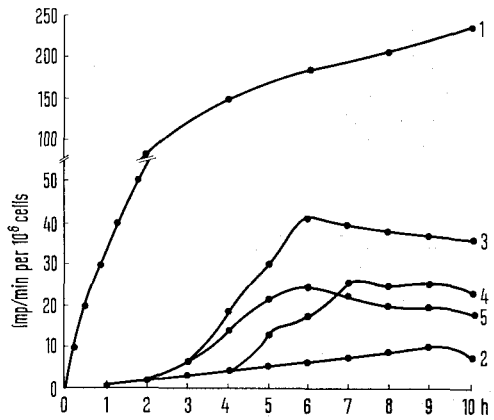
for the study of the inhibition of the synthesis of viral RNA by various compounds.

The present study illustrates the application of this method to the synthesis of RNA of Newcastle disease virus (NDV).

A monolayer culture of chick embryo fibroblasts was suspended in 0.5% lactalbumin hydrolysate with 20 μM/ml of L-glutamine. Each flask contained $5 \cdot 10^7$ cells. Actinomycin D, 10 μg/ml, was added to the culture 20 min before or 40 min after infection. The culture was infected with NDV, 180 ID 50 per cell, and in 40 min C^{14}-uridine, 4.5 μCu/ml, was added. All procedures were carried out at a temperature of 37°C. The incorporation of C^{14}-uridine was arrested by the addition of 0.1 initial volume of 5% solution of sodium dodecyl sulphate and then by the addition of an equal volume of 20% cold trichloroacetic acid. The suspension was passed through a millipore filter, RUFS type, and washed by 5% cold trichloroacetic acid. The filters were placed on cardboard and radioactivity was determined with a counter of the Geiger-Mueller type.



Synthesis of RNA in chick embryo fibroblasts infected with NDV and treated with inhibitors of protein synthesis as measured by the incorporation of C^{14}-uridine. 1, normal cells; 2, cells treated with actinomycin D, 10 μg/ml; 3, cells treated with actinomycin D and infected with NDV, 180 ID 50 per cell; 4, experiment (2) with addition of D,L-hexafluorovaline $7 \cdot 10^{-4} M$; 5, experiment (2) with addition of L-ethionine, $3 \cdot 10^{-3} M$. Amino acid analogues were added 60 min before the inoculation.

In some experiments total RNA was isolated after SCHERRER and DARNELL[4].

The results of the study are shown in the Figure. It is evident that the rate of synthesis of cellular RNA as measured by incorporation of C^{14}-uridine is strongly inhibited by actinomycin D. In virus-infected cells the synthesis of viral RNA begins 2–3 h after infection and is not inhibited by the antibiotic. The virus-specific RNA synthesis is about 20% of that of the cellular RNA in non-infected cells.

Two compounds, D,L-hexafluorovaline and L-ethionine[5,6], inhibit the synthesis of viral RNA, although the time and the rate of inhibition for the two compounds are different. While L-ethionine decreases the rate of C^{14}-uridine incorporation by not more than 45–50%, D,L-hexafluorovaline also prolongs the latent period. Supposedly similar inhibitor action may be achieved by the use of *p*-fluorophenylalanine. This action of the inhibitors of proteinsynthesis may be connected with the alteration of the synthesis of early virus-specific proteins which are necessary for the replication of viral RNA.

Zusammenfassung. In mit Actinomycin D behandelten und mit dem Pseudogeflügelpest-Virus (NDV) infizierten Zellen gelingt der Nachweis einer ausgesprochenen Phase der Virus-RNS-Synthese. Mit dieser Methode lässt sich ebenfalls die Wirkung verschiedener Präparate auf die Virusnukleinsäuresynthese erfassen.

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A Model of a Cerebral Tumour for Studies in Cancer Chemotherapy

This note is intended to describe a simple and reproducible method for studying the effect of antitumoral agents on tumours growing within the brain. The methods previously employed require traumatic procedures and animal species, such as hamsters and rabbits, which are not frequently used in cancer chemotherapy[1]. Male Sprague-Dawley rats, average weight 140–180 g, were used throughout all experiments. Flexner-Jobling carcinoma, Walker 256 carcinosarcoma, T_8 uterine epithelioma or D 117 osteosarcoma transplanted subcutaneously 15 days before the experiment, were excised, cleaned of necrotic material and minced under conditions of sterility. The fragments were homogenized in a stainless steel homogenizer[2] previously sterilized. The homogenate was diluted with a phosphate buffer at pH 6.9 (1:5 w/v) and then centrifuged for 2 min at 800 rpm. The supernatant transferred into a sterile tube was used for the cerebral implantation. The intracerebral injection was performed according to the method described by VALZELLI[3]. A No. 20 needle covered with a plastic muffle 11 mm from the tip was inserted into the squamo-petrosal fissure of animals submitted to a light ether anaesthesia. The amount injected with a Hamilton syringe (0.1 ml) was always 0.02 ml. By using this technique, the cells are implanted in the

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