DNA as the cerebral cortex, or some subcortical gray structures.

The distribution of RNA presents an entirely different picture. The highest concentrations were found in areas of the cerebellar and cerebral cortex, somewhat lower in caudate nucleus, thalamus and hypothalamus, and the lowest in the midbrain and more distal structures. Such a distribution of RNA apparently reflects the process of phylogenetic and ontogenetic development, and the degree of morphological and functional differentiation of the CNS. Whether the distribution pattern is due to the cytoarchitectonic differences among various regions is not clear at present. The highest concentrations of RNA in the cortical regions confirmed once again a well-known fact that they are the sites of the greatest metabolic activities.

LJ. MIHAILOVIĆ, B. D. JANKOVIĆ, M. PETKOVIĆ, and D. MANČIĆ

Institute of Pathological Physiology, Medical School; Microbiological Institute, School of Pharmacy, University of Belgrade, and Biochemical Department, Boris Kidrič Institute for Nuclear Sciences, Belgrade (Yugoslavia), September 18, 1957.

Résumé

Chez le chat normal, la concentration d'ADN est à peu près la même dans les diverses régions examinées du système nerveux central. Par contre, la concentration d'ARN varie considérablement d'une région à l'autre. Ces résultats suggèrent que la distribution de l'ARN correspond à la différentiation morphologique et fonctionnelle des parties du cerveau.

La posizione occupata dalla fosforilcolina, citidindifosfatocolina, α-glicerilfosforilcolina e da altri corpi analoghi nel ciclo metabolico di alcuni fosfatidi encefalici

Al fine di poter precisare la posizione occupata nel ciclo metabolico dei neurofosfatidi dai singoli corpi fosforati isolati mediante la tecnica descritta in altra sede[1], è stata studiata *in vivo* la velocità di «turnover» di ciascuno di essi.

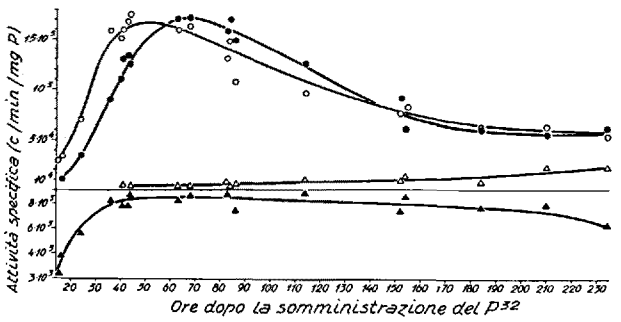

Fig. 1. Velocità di «turnover» della fosforilcolina (o), citidindifosfatocolina (●), L-α-glicerilfosforilcolina (△) e fosfatidilcolina (▲) nel sistema nervoso centrale di ratti di pochi giorni di vita. Ciascun segno indica il valore medio dell'attività specifica ottenuto da 4 esperimenti.

[1] N. MIANI, Exper. *14*, 34 (1958).

Ratti del ceppo Wistar ricevettero per via intraperitoneale al 3° giorno di vita una singola dose di $NaH_2{}^{32}PO_4$ (3 μc/g di animale) e furono sacrificati per decapitazione nell'ordine indicato nelle Figure 1–3. Ciascun segno riportato nelle figure indica il valore medio dell'attività specifica ottenuto da 4 esperimenti.

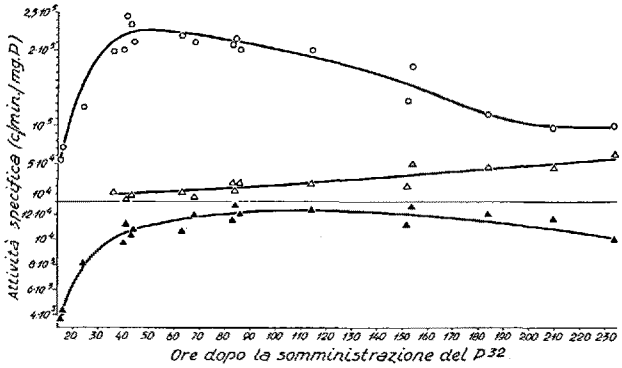

Fig. 2. Velocità di «turnover» della fosforiletanolamina (o), L-α-gliceril fosforiletanolamina (△) e fosfatidiletanolamina (▲) nel sistema nervoso centrale di ratti di pochi giorni di vita. Ciascun segno indica il valore medio dell'attività specifica ottenuto da 4 esperimenti.

Dall'esame delle curve si possono trarre le seguenti conclusioni:

1° La fosforilcolina ha la più alta velocità di «turnover» rispetto agli altri corpi fosforati contenenti colina.

2° Sulla base di presupposti teorici[2], la citidindifosfatocolina rappresenta l'immediato prodotto di trasformazione della fosforilcolina.

3° A sua volta la curva di attività specifica della citidindifosfatocolina e quella della fosfatidilcolina si dimostrano in rapporto quantitativo tale da lasciare ampio credito alla supposizione che il primo composto generi il secondo.

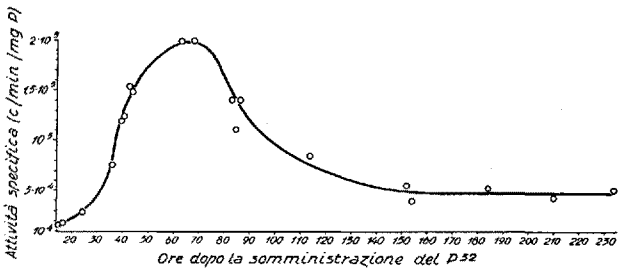

Fig. 3. Velocità di «turnover» della fosforilserina nel sistema nervoso centrale di ratti di pochi giorni di vita. Ciascun segno indica il valore medio dell'attività specifica ottenuto da 4 esperimenti.

4° L'andamento della curva di attività specifica relativa alla L-α-glicerilfosforilcolina suggerisce che essa non rappresenti il prodotto di trasformazione della fosforilcolina o della citidindifosfatocolina; può invece rappresentare il prodotto di degradazione della fosfatidilcolina o almeno di quella quota di essa metabolicamente più attiva.

5° Le curve di attività specifica della fosforilcolina, fosforiletanolamina e fosforilserina hanno un decorso fondamentalmente simile.

[2] D. B. ZILVERSMIT, C. ENTENMAN e M. C. FISHLER, J. gen. Physiol. *26*, 325 (1943). – J. M. REINER, Arch. Biochem. Biophys. *46*, 53, 80 (1953).

6° Le curve di attività specifica della L-α-gliceril-fosforilcolina e L-α-glicerilfosforiletanolamina hanno pure esse un decorso simile.

7° La sintesi dei fosfatidi contenenti colina (lecitina e probabilmente i fosfosfingosidi), o etanolamina (fosfatidiletanolamine e acetalfosfatidiletanolamina) oppure serina (fosfatidilserina) si attua attraverso tappe omologhe, secondo lo schema: fosforil-base azotata → citidindifosfato-base azotata → fosfatidil-base azotata.

8° La degradazione della fosfatidilcolina e della fosfatidiletanolamina (probabilmente anche della acetalfosfatidiletanolamina) dà origine alla L-α-glicerilfosforil-base azotata corrispondente.

N. MIANI e G. BUCCIANTE

Istituto di Anatomia, Università di Padova, il 16 settembre 1957.

Summary

The rate of turnover of individual P-compounds, related to the metabolic cycle of some phosphatides, was followed *in vivo* in the brain of rats a few days old after ^{32}P administration. The phosphorylcholine is the precursor of the cytidinediphosphatecholine; this in turn may be the precursor of lecithin. The L-α-glyceryl-phosphorylcholine represents the degredation product of lecithin. The specific activity curves of the phosphoryl-ethanolamine and phosphorylserine are similar to that of the phosphorylcholine; likewise the L-α-glycerylphosphorylethanolamine is similar to the activity curve of the L-α-glycerylphosphorylcholine.

On the Incorporation of S^{35}-Methionine in Artificially Activated Sea Urchin Eggs

In a previous paper the results were described of experiments in which the distribution of S^{35} labelled DL-methionine among cell fractions of unfertilized and developing sea urchin eggs was studied (NAKANO and MONROY[1]). In that investigation advantage was taken of a newly developed technique which allows efficient incorporation of radioisotopes in the unfertilized sea urchin eggs (NAKANO and MONROY[2]). It was shown that in the unfertilized egg the isotope is mainly stored in the fraction soluble in 10% trichloroacetic acid (non-protein fraction, called 'TCA-soluble fraction') while only a minor percentage is taken up by other cell components. This situation does not substantially alter upon storage of labelled unfertilized eggs up to 6 h. Upon fertilization and initiation of development, a depletion of radioactivity of this fraction takes place; this process is very rapid during the first few hours of development and then slows down progressively. At the same time a rapid uptake of isotope is observed in the mitochondria fraction; this follows an exponential course during the first 6 h of development and afterwards proceeds almost linearly.

It appeared then interesting to make a similar investigation on eggs artificially activated, in which no morphogenesis takes place.

Also, in the present investigation, S^{35}-DL-methionine has been used which was incorporated in the unfertilized eggs by the injection of 10–20 μc into the body cavity of adult females of *Paracentrotus lividus*, as previously described (NAKANO and MONROY[2]).

[1] E. NAKANO and A. MONROY, Exper. Cell Res. (in press).
[2] E. NAKANO and A. MONROY, Exper. *13*, 416 (1957).

Activation was obtained by a 45 s treatment of the egg suspension with butyric acid (7 ml of 0·1 *N* butyric acid in 100 ml of egg suspension). The acid was then quickly neutralized with 0·7 ml of 1 *N* NaOH. Membrane formation soon took place. The eggs were then washed three times with sea water and finally divided into three batches which were allowed to develop under gentle shaking at room temperature (about 21°C). A sample of non-activated eggs was also collected.

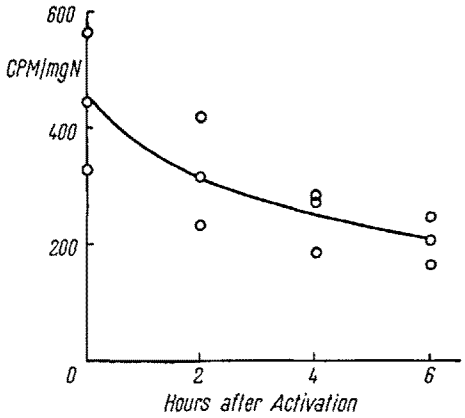

Fig. 1. – Decrease of the activity of the TCA-soluble fraction during the first 6 h after artificial activation of eggs of *Paracentrotus lividus*. The 0 time is the activity in the unfertilized eggs.

The butyric acid activation results, as it is known, in membrane formation and in a succession of monaster cycles. After a couple of hours, the eggs begin to form irregular furrows which give rise to blastomere-like formations. In the course of several hours the eggs undergo cytolysis.

In the present experiments the eggs were collected 2, 4 and 6 h after activation. The washed eggs were homogenized and the homogenate was fractionated as previously described (NAKANO and MONROY[1]). Three such experiments were performed and the results are illustrated in the accompanying diagrams.

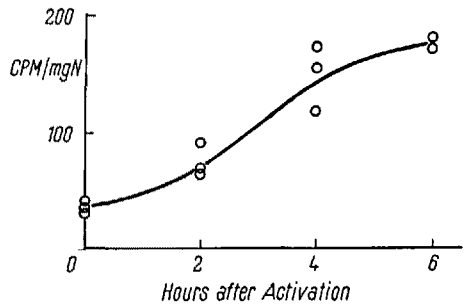

Fig. 2. – Uptake of the isotope by the mitochondria fraction of artificially activated eggs of *Paracentrotus lividus*.

The activity of the TCA-soluble fraction undergoes a decline which is rapid during the first 2 h and then proceeds more slowly (Fig. 1). The reverse is true for the mitochondria fraction in which the uptake of the isotope follows an exponential course (Fig. 2).

These results can thus be well superimposed on those obtained in the case of normally fertilized and developing eggs. This may suggest that these processes, taking place during the first few hours, which in the fertilized eggs correspond to the cleavage period, depend on activation itself rather than on morphogenesis.