

## Rôle of the Nucleus in the Maintenance of the Protein Level in the Alga *Acetabularia mediterranea*

BRACHET and CHANTRENNE<sup>1</sup> have shown that a difference in the uptake of labelled  $\text{CO}_2$  by the proteins of the nucleated and non-nucleated regenerating segments of *Acetabularia mediterranea* can first be noticed 2 weeks after the operation, i.e. at the time when regeneration in non-nucleated segments ceases. It was also found<sup>2</sup> that the lowering of the ability to incorporate  $\text{CO}_2$  into the proteins is more pronounced in the small cytoplasmic granules than in the chloroplasts. These observations were paralleled by the finding<sup>3</sup> that during a first period after the operation no difference could be detected in the amount of protein-N between nucleated and non-nucleated regenerating algae. It was by the end of the second week that a decrease was observed in the latter, while the former showed a steady increase.

On this last point, however, my observations are somewhat at variance as they seem to indicate that a decrease of protein-N in non-nucleated segments of *Acetabularia mediterranea* is already noticeable during the first week following the operation.

The experiments were performed on batches of *Acetabularia mediterranea* obtained from the Zoological Station, Naples. "Erdschreiber" solution was used as a culture medium for both normal and regeneration algae. Before the analysis, the algae were rapidly rinsed in distilled water and then homogenised with cold 5% trichloro-acetic acid. Protein and non-protein-N (P-N and NP-N) were estimated in the insoluble and soluble fractions respectively by direct nesslerization after combustion. The results were calculated as the ratio between protein-N and non-protein-N (P-N/NP-N), which was considered to be a much better reference than wet or dry weight or length of the algae, which may be liable to undergo changes independently of the regeneration process.

The results of the experiments are summarized in the above diagramm. The curve shows that in both nucleated and non-nucleated segments an increase of the ratio P-N/NP-N occurs during the first day following the operation. In the following days this ratio undergoes a decrease, which is, however, much greater in the non-nucleated than in the nucleated algae. In fact, while in the latter the values slowly approach the mean value for normal algae ( $1.47 \pm 0.078$ ), in the former already during the 3<sup>rd</sup>–4<sup>th</sup> day they are well below it. The decrease goes on slowly until the 13<sup>th</sup> day, when the observations were discontinued. In one experiment, marked by  $\times$  in the diagramm, the values for P-N/NP-N were considerably higher than in the other experiments during the first day after the operation. Also in this case, however, in the non-nucleated segments they were well below those of the nucleated ones.

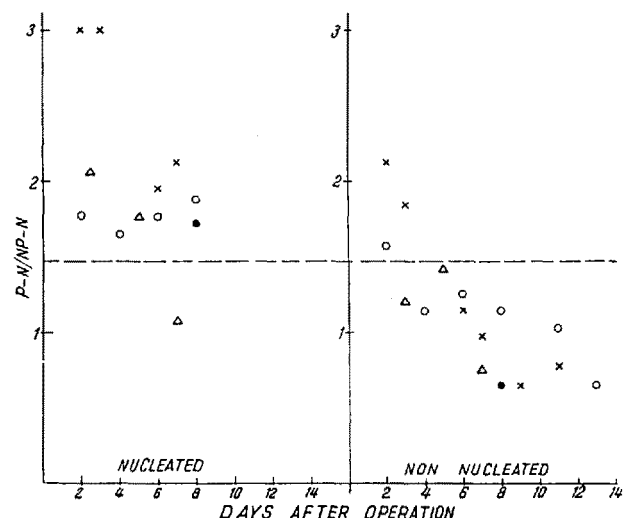
These experiments seem to indicate the presence in *Acetabularia mediterranea* of some proteins the maintenance of which is strongly influenced by the nucleus.

<sup>1</sup> J. BRACHET, H. CHANTRENNE, *Protein Synthesis in Nucleated and Non-Nucleated Halves of Acetabularia Mediterranea Studied with Carbon-14 Dioxide*, *Nature* 168, 950 (1952).

<sup>2</sup> J. BRACHET and H. CHANTRENNE, *Incorporation de  $\text{C}^{14}\text{O}_2$  dans les protéines des chloroplastes et des microsomes de fragments nucléés et anucléés d'*Acetabularia mediterranea**, *Arch. int. Physiol.* 60, 547 (1952).

<sup>3</sup> F. VANDERHAEGHE, *Mesures de croissance de fragments nucléés et énucléés d'*Acetabularia mediterranea**, *Arch. int. Physiol.* 60, 190 (1952).

Possibly they are the most metabolically active ones. Also in *Amoeba* a decrease of dipeptidase has been ob-



Values of the P-N/NP-N ratio in nucleated and non-nucleated regenerating segments of *Acetabularia mediterranea*. Various symbols refer to the experimental series. Dotted line indicates the mean values for normal algae.

served following enucleation, while proteinases did not show any appreciable change<sup>1</sup>.

The present work has been supported by a grant of the Rockefeller Foundation to the Institute of Comparative Anatomy of the University of Palermo.

G. GIARDINA

*Department of Comparative Anatomy, University of Palermo, February 18, 1954.*

### Riassunto

Sono state studiate le variazioni del rapporto tra l'N proteico e non proteico in segmenti rigeneranti, nucleati ed anucleati, di *Acetabul. medit.* I risultati ottenuti hanno dimostrato che il predetto rapporto aumenta in entrambi i segmenti il primo giorno dopo l'operazione. Nei giorni seguenti esso diminuisce in entrambi i segmenti, ma più sensibilmente in quelli anucleati, nei quali va al di sotto del valore medio delle alghe normali già dopo il 3°–4° giorno.

<sup>1</sup> E. URBANI, *La teneur en dipeptidase et en protéinase de fragments nucléés et énucléés d'amibes*, *Arch. int. Physiol.* 60, 190 (1952).

## Heterologe Transplantation von Tumoren nach Vorbehandlung der Wirtstiere mit radio-aktiven Isotopen

Tumoren mit einer bestimmten Tierspezies können mit der in der Tumorforschung üblichen Transplantationstechnik nicht auf eine andere Spezies übertragen werden. MURPHY<sup>1</sup> zeigte jedoch schon 1914, dass auf Ratten implantierte Mäusetumoren während einer gewissen Zeit weiterwuchsen, wenn diese Ratten mit einer Röntgenganzbestrahlung vorbehandelt wurden. In der letzten Zeit wurden diese Versuche bestätigt<sup>2</sup>.

<sup>1</sup> J. MURPHY, *J. amer. med. Assoc.* 62, 1459 (1914).

<sup>2</sup> H. W. TOOLAN, *Proc. Soc. Exp. Biol. Med.* 77, 572 (1951). – W. BOLLAG und CL. MEYER, *Oncologia* (im Druck).