Cytoplasmic DNA-Activity During Vitellogenesis in Spider *Araneus nauticus* Koch (Aranae: Argiopidae)

Cytoplasmic DNA has been well reported in the oocytes of different animals by ELSON and CHARGAFF[1], HOFF-JORGENSEN and ZEUTHEN[2], SZE[3], BRACHET and QUERTIER[4], SAREEN[5-7], BALTUS and BRACHET[8], HANOCQ-QUARTIER et al.[9] and BALTUS et al.[10]. However, to our knowledge, there is no record of whether or not the cytplasmic DNA is involved in the process of vitellogenesis. In the present communication, the possible involvement of cytoplasmic DNA during vitellogenesis in spider *Araneus nauticus* has been deduced on the basis of histochemical analysis.

Specimens of *A. nauticus* were collected from the corners of an old abandoned house. The ovaries from the females were dissected out, fixed and processed by standard methods[11-13] for the detection of DNA with its usual trichloroacetic acid control, protein and RNA.

The precursors of yolk develope at the periphery of the oocyte, which normally measures 30 µm in diameter. These precursors are granular and give strong reaction for DNA (Figure 1) and weak reaction for protein. These granules now disperse in the ooplasm (Figure 2). In later stages, when an individual oocyte measures on average 130 µm in diameter, the precursors at the periphery enlarge into small globules (Figure 3). The latter now fragment into very small granules, which disperse randomly in the ooplasm, and in between which, the yolk bodies develope (Figure 4). These bodies measure on average 15 µm in diameter and give a strong reaction for protein and RNA. In mature oocytes, the DNA content of the precursors appears to be greatly depleted, being barely visible along the margin of the yolk bodies (Figure 5).

Considering these observations, the possibility of involvement of the cytoplasmic DNA in the formation of yolk in *A. nauticus* cannot be ignored. The cortical DNA^{+ve} granules increase in size with a concurrent increase in the amount of DNA. The DNA increase, as is discernable by the increase of size and intensity of the DNA^{+ve} granules, is assumed to be by a process of rapid replication, to feed

[1] D. ELSON and E. CHARGAFF, Experientia *8*, 143 (1952).
[2] E. HOFF-JORGENSEN and E. ZEUTHEN, Nature, Lond. *169*, 245 (1952).
[3] L. C. SZE, J. exp. Zool. *122*, 577 (1953).
[4] J. BRACHET and J. QUERTIER, Expl Cell Res. *32*, 410 (1963).
[5] M. L. SAREEN, Res. Bull. Panjab Univ. *14*, 273 (1963).
[6] M. L. SAREEN, Res. Bull. Panjab Univ. *15*, 169 (1964).
[7] M. L. SAREEN, Res. Bull. Panjab Univ. *16*, 1 (1965).
[8] E. BALTUS and J. BRACHET, Biochim. biophys. Acta *61*, 157 (1962).
[9] J. HANOCQ-QUERTIER, E. BALTUS, A. FICQ and J. BRACHET, J. Embryol. exp. Morph. *19*, 273 (1968).
[10] E. BALTUS, J. HANOCQ-QUERTIER and J. BRACHET, Proc. natn. Acad. Sci., USA *61*, 469 (1968).
[11] R. FEULGEN and H. ROSSENBECK, Z. phys. Chem. *135*, 203 (1924).
[12] D. MAZIA, P. A. BREWER and M. ALFERT, Biol. Bull. *104*, 57 (1953).
[13] N. B. KURNICK, Stain Tech. *30*, 213 (1955).

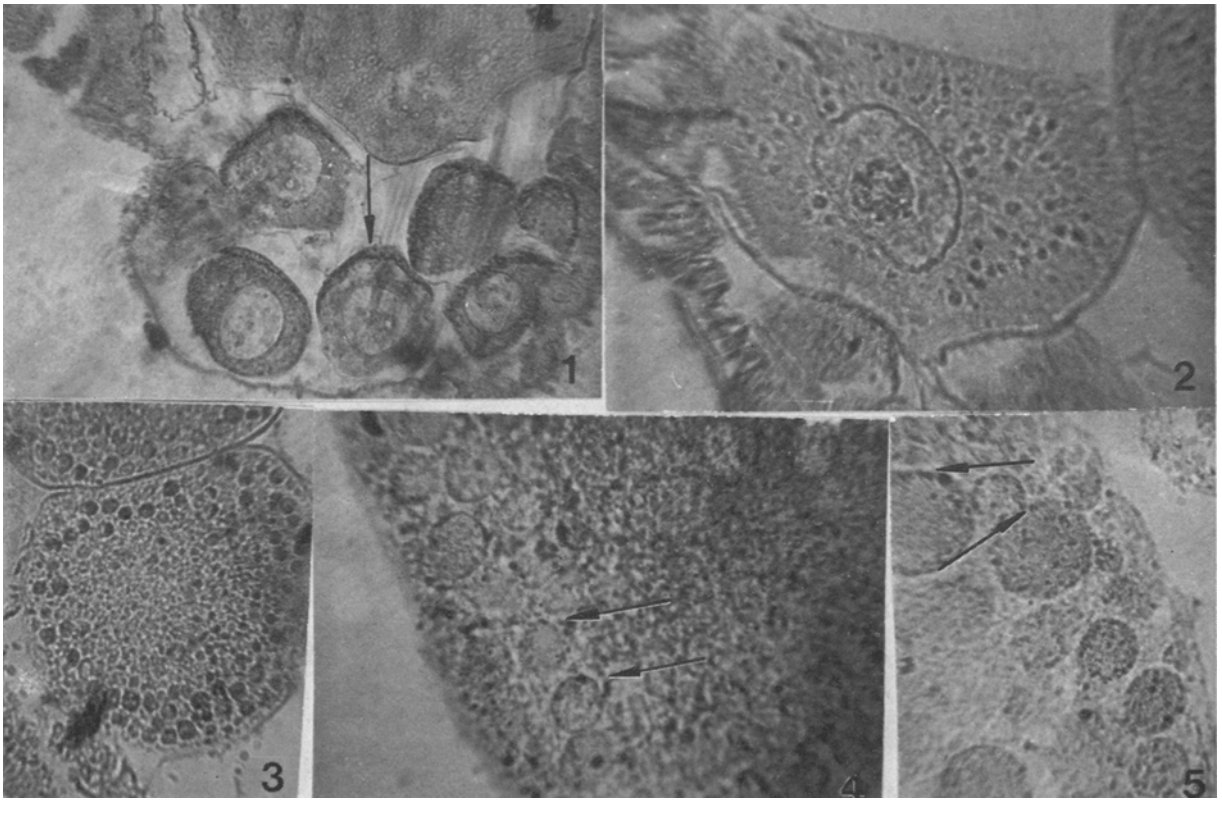

Fig. 1–5. Photomicrographs of section of oocytes of *Araneus nauticus*. Feulgen. ×800. 1. DNA^{+ve} yolk precursors along peripheral ooplasm. 2. Cytoplasmic DNA granules. 3. DNA^{+ve} globules. 4. DNA^{+ve} granules between developing yolk bodies. 5. Traces of DNA along the margin of yolk bodies.

the cellular machinery with the required amount of raw materials during the synthetic activities of the oocyte in the elaboration of yolk. The DNA granules break up and the yolk apparently formed under their influence react rather strongly for protein and RNA. It is not unlikely that these two constituents of yolk, enough of which must be produced to cope with the demand of vitellogenesis, are assembled under instructions from DNA. This inference is further supported by the fact that, in the yolk-crammed mature oocytes, the DNA is visible just in traces indicating its disintegratation soon after the completion of vitellogenesis.

Summary. Cytoplasmic DNA is possibly involved in the synthesis of yolk in spider *Araneus nauticus.*

G. P. Verma, K. C. Patra[14] and C. C. Das[14]

P. G. Department of Zoology, Bihar University, Langat Singh College, Muzaffarpur (India), and P. G. Department of Zoology, Berhampur University, Orissa (India), 3 February 1975.

[14] P. G. Department of Zoology, Berhampur University, Orissa, India.

Local Haemostasis in Brain Tumours

Little interest has been dedicated up to now to the local haemostasis in tumours[1,2]. Only recently have reports appeared on the occurrence in serum and other fluids of fibrin/fibrinogen degradation products (FDP) as the results of coagulation and fibrinolytic processes at the site of the neoplasm[2,3]. Determination of FDP in neoplastic diseases has proved useful in the diagnosis and treatment of malignant diseases[2,4,5].

The present investigation was undertaken to elucidate the local haemostasis of two different cerebral tumours, viz meningiomas and gliomas. We examined 13 supratentorial tumours (7 meningiomas and 6 gliomas) operated upon at the Neurosurgical Clinic of Umeå.

Thromboplastic activity was determined essentially according to Astrup et al[6]. The piece of tissue was homogenized with 0.15 *M* NaCl, 0.9 ml per 100 mg of tissue. Larger specimens were divided into fragments weighing 2–3 g, which were tested separately. After homogenization the suspension was frozen overnight, thawed and rehomogenized. The larger particles of the resulting suspension were afterwards removed by filtration through cotton wool. Serial dilutions of the filtrate with saline were prepared. The assay system consisted of: 0.1 ml saline; 0.2 ml human platelet-poor citrated human plasma; 0.2 ml 0.03 *M* $CaCl_2$; 0.1 ml tissue suspension. The mixture of saline, plasma and tissue extract was first heated for 3 min at 37 °C in a thermostatic bath after which $CaCl_2$ was added and double determinations were made of the clotting time. The clotting time is given in seconds as the mean of two determinations. Results are expressed as percentages of the activity of a standard suspension of human brain thromboplastin as determined by interpolation on the straight line obtained by plotting dilutions against clotting times in a double logarithmic graph.

Fibrinolytic activity. The specimens were examined by a modification[7] of Todd's fibrin slide technique[8] which permits localization and assay of fibrinolytic activity in tissues. A series of 4 slides was prepared for each specimen. The slides of each series were incubated for increasing periods of time, i.e. 15, 30, 45, 60 min respectively, and afterwards fixed in formalin and stained with Harris' haematoxylin. 3 fairly distinct degrees of fibrin digestion were recognized, namely grade I: microscopical punctate

[1] H. I. Peterson, Acta chir. scand., suppl. *1969*, 394.
[2] L. Svanberg, F. Linell, M. Pandolfi and B. Åstedt, Acta path. microbiol. scand., in press.
[3] I. M. Nilsson, Scand. J. Haemat. *13*, 317 (1971).
[4] L. Svanberg, B. Åstedt, I. Gynning and I. M. Nilsson, Acta obst. gynec. scand. *52*, 141 (1973).
[5] B. Åstedt, L. Svanberg and I. M. Nilsson, Br. med. J. *4*, 458 (1971).
[6] T. Astrup, O. K. Albrechtsen and J. Rasmussen, Circulation Res. *7*, 969 (1969).
[7] M. Pandolfi, B. Robertson, S. Isacson and I. M. Nilsson, Thromb. Diath. haemorrh. *20*, 247 (1969).
[8] A. S. Todd, J. path. Bact. *78*, 281 (1959).

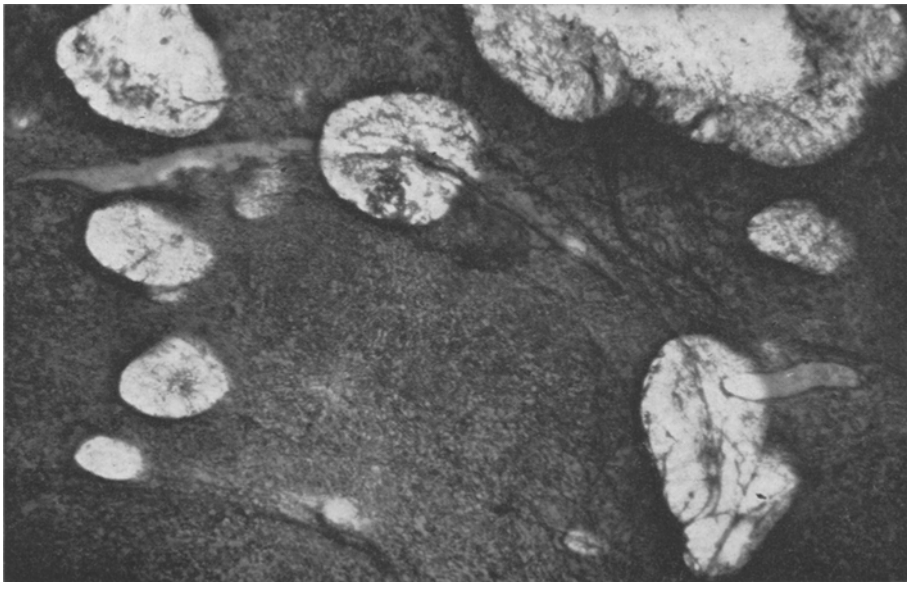

Fig. 1. Meningioma. Numerous areas of fibrinolysis confined to connectival septa and to blood vessel. Incubation time 30 min. ×25.