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.*

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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

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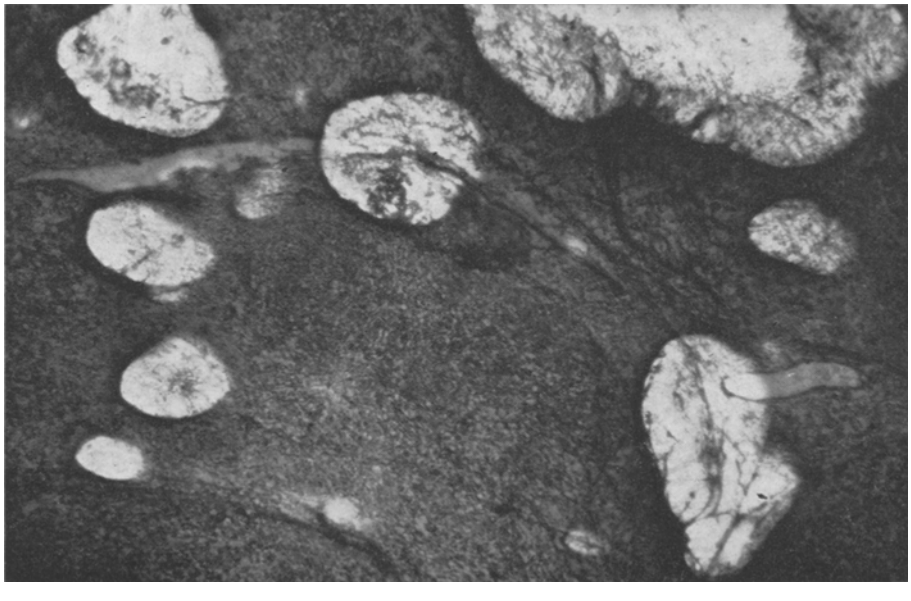

Fig. 1. Meningioma. Numerous areas of fibrinolysis confined to connectival septa and to blood vessel. Incubation time 30 min. ×25.

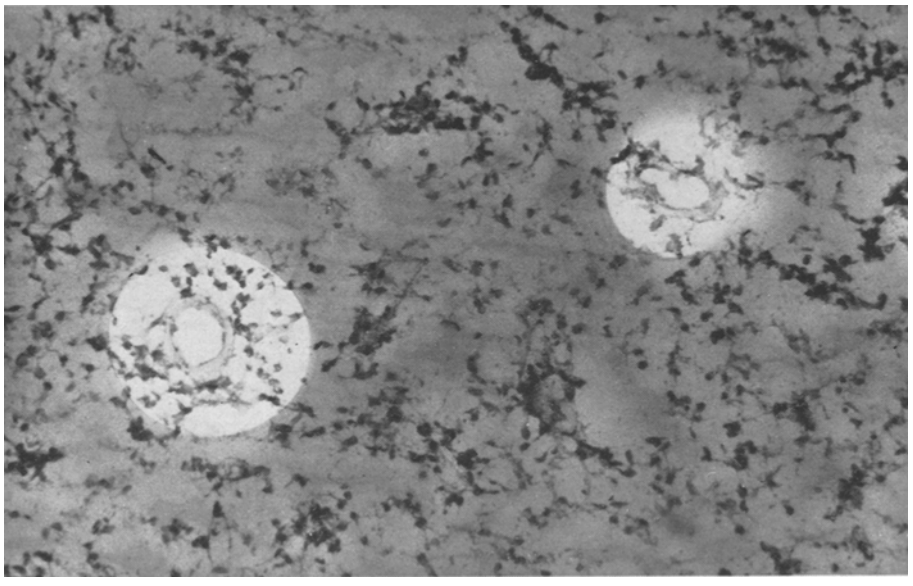

Fig. 2. Glioma. Discrete fibrinolysis showed by small blood vessels. Incubation time 45 min. ×63.

areas of lysis in most of the sections; grade II: gross lytic areas of irregular outline and sometimes confluent; grade III: dissolution of most or all the fibrin in contact with the sections. A grade I slide was allotted 1 point; a grade II slide, 2 points and a grade III slide, 3 points. The total number of points scored by the set of 4 slides was taken as a measure of the fibrinolytic activity of the sample. Wilcoxon's rank sum test was used for comparing the activities.

The Table reports the values found for the thromboplastic activity of the tumour specimen examined. The activity varied notably between individuals, but considerably less between fragments of one and the same tumour. It is clear from the Table that the thromboplastic activity of the gliomas was higher than that of meningiomas. The activity of some of the gliomas exceeded that of the standard reference. The difference between gliomas and meningiomas was highly significant ($p < 0.001$) when calculated on the basis of all the activity values and almost significant ($p < 0.05$) calculated from the mean values of the individual tumours.

Thromboplastic and fibrinolytic activity of gliomas and meningiomas

Case No.	Sex	Age		Thromboplastic activity	Fibrinolytic activity
1	♂	31	Meningioma	21, 18 (19.5)	7.5
2	♀	42	Meningioma	15,5 (10)	10.5
3	♂	37	Meningioma	22	5.5
4	♀	70	Meningioma	7, 18, 23, 23 (18)	7.5
5	♂	68	Meningioma	100, 115 (108)	11
6	♀	40	Meningioma	3	7
7	♂	53	Meningioma	5, 15, 26, 23 (17)	6
8	♂	46	Glioma	66	2
9	♂	54	Glioma	105	–
10	♂	63	Glioma	17	2
11	♂	58	Glioma	65, 75 (70)	7
12	♀	47	Glioma	150, 140, 100, 125 (129)	3
13	♀	51	Glioma	–	2.5

Thromboplastic activity is expressed as percentage of the concentration of standard human brain thromboplastin. Mean thromboplastic activity values in bracket. Fibrinolytic activity is expressed in arbitrary units.

The fibrin slide technique showed that the activity was confined to the meningeal sheeths surrounding the tumours, and to connectival septa and small blood vessels situated in the tumour mass (Figures 1 and 2). Grading the strength of the fibrinolytic activity showed that the fibrinolytic activity of meningiomas was significantly higher ($p < 0.01$) than that of gliomas (Table).

The results show the existence of two different local haemostatic balances in two common brain tumours, gliomas and meningiomas. In gliomas the local conditions are such as to favour the deposition of fibrin and the prolonged persistence of these deposits; in meningiomas the amounts of fibrin deposited are presumably smaller and are broken down quicker because of the comparatively lower thromboplastic activity and higher fibrinolytic activity of these tumours. This finding might help to explain the better haemostasis shown during surgery by gliomas compared with that of meningiomas[9]. Recently Koos et al.[10] found that it is possible to depress the fibrinolytic activity of intracranial tumours by antiplasmin drugs, in order to avoid intracranial bleeding. In the light of these results this treatment seems especially indicated in meningiomas.

Summary. The thromboplastic activity and the fibrinolytic activity were examined in 7 human meningiomas and 6 gliomas obtained at neurosurgery. Two different haemostatic patterns emerged, meningiomas having lower thromboplastic and higher fibrinolytic activity than that of gliomas. This difference might help to explain the better haemostatic capacity of gliomas during and after operation than that of meningiomas.

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