received injections of several thousand fresh L_4 and L_5 stages and the other group similar quantities of 0·5 per cent formalin-treated L_4 and L_5 larvæ. No protection could be induced below 100,000 with L_3 larvæ and the best that was achieved with larger amounts was a 50 per cent advantage over controls.

The evidence from these studies indicates that the histotrophic stages of *H. contortus* are important sources of antigen and appear to be the antibody-susceptible stages.

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'Carcinolipin': an Endogenous Carcinogenic Substance

A FACTOR affecting protein synthesis has been recently detected in egg-yolks[1]. This substance has since been isolated in crystalline form and it is possible to obtain the same crystalline material from animal tissues also[2]. Liver and other tissues from tumour-bearing rats contained a higher amount of this compound when compared with the same tissues from normal animals[3].

This material enhances the incorporation of labelled amino-acids into proteins of Ehrlich ascites cells and tissue-homogenates *in vitro*[2]. Also the incorporation of labelled amino-acids into proteins of rat liver microsomes is stimulated in the presence of this substance[4], and it seems that it is capable of influencing protein biosynthesis in its every stage[5]. The net-synthesis of serum albumin in rat liver slices *in vitro* is greatly enhanced by the addition of this compound into the incubation mixture[6].

The effect on the incorporation of labelled amino-acids into ascites cells protein appears to be strikingly dependent on dose. Some doses have stimulatory activity while others cause an inhibition of this process[2]. The same general pattern was also found when the effect of carcinogenic hydrocarbons was tested in the same system. Related non-carcinogenic hydrocarbons are free of this activity, which seems to be rather specific for carcinogenic substances[7]. For this reason carcinogenic activity was presumed for our substance mentioned above.

To investigate this possibility further, 50 Wistar rats of both sexes, 8 months old, were injected subcutaneously with this compound (3 mgm. each) in olive oil. Control group of 50 animals received the same amount of pure olive oil.

The incidence of tumours in the experimental group is given in Table 1. After fourteen months no tumours have been found in the control group. An unusually high incidence of chronic pneumonia with frequent bronchiectasias (10 cases) appeared in the experimental group (no case in the controls as yet). This disease is known to occur fairly often in old rats[8] but not in younger ones.

This experiment is of course not yet completed, and there are further tumours appearing in the experimental group. However, it is clear already from these preliminary results that our compound has definite carcinogenic activity.

Table 1. TUMOUR INCIDENCE IN RATS TREATED WITH 'CARCINOLIPIN' (Latent period is given in months after single subcutaneous administration of 3 mgm. 'carcinolipin')

Latent period	Site	Histological appearance
5	Subcutaneous (site of injection)	Sarcoma
9*	Abdominal cavity	Carcinoma
9†	Lungs and abdominal cavity	Carcinoma
9	Subcutaneous (site of injection)	Sarcoma
11	Subcutaneous (site of injection)	Sarcoma
12	Mammary gland	Fibroadenoma
13	Mammary gland	Fibroadenoma

* In this case a very large tumour was found originating perhaps in the liver tissue.
† Very large tumours were found in this case, one originating from the lungs, the other being localized in abdominal cavity. Because of the magnitude of these tumours as well as their highly polymorphous appearance, the same in both cases, it was not possible to ascertain the site of the primary tumour.

The chemical nature of this substance is not quite clear. It is of lipid nature and seems to contain a bound phosphorylated pentose, also. Because of the predominantly lipid character of the active substance as well as its carcinogenic properties, the name 'carcinolipin' is proposed for it until its exact chemical structure is made clear.

It is very probable that 'carcinolipin' is responsible for the higher incidence of tumours found in mice fed egg-yolks[9]. It seems quite probable, too, that 'carcinolipin' might be identical with the endogenous carcinogenic substance[10]. A closely similar isolation method followed in our experiments strongly supports this view. Moreover, tumours of various types were found. The ability to produce tumours not only on the site of subcutaneous injection seems to be characteristic of the endogenous carcinogenic substance[11], carcinogenic hydrocarbons, on the other hand, producing almost exclusively subcutaneous sarcomas after this mode of administration.

'Carcinolipin' seems to possess a general role of a growth-promoting factor in tissues and other biological materials, since it stimulates the growth of young rats and chickens when added to their diet (Hradec, J., and Trojan, K., unpublished work). Probably it is capable of inducing malignant growth only in certain circumstances, which are being investigated further in our laboratory.

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