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Bacterial Ribonucleic Acid Synthesis in Frog Organs after Intraperitoneal Injection of Bacteria

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Plant or animal organs dipped in a suspension of bacteria synthesize bacterial RNA (Stroun *et al.*, 1969; Stroun & Anker, 1971a,b; Anker & Stroun, 1972). This phenomenon, which we called 'trans-cession', is due to the spontaneous release of DNA from bacteria (Borenstein & Ephrati-Elizur, 1969) into cells of higher organisms.

In the present work we show that the same phenomenon can take place in more natural conditions, such as occur, for instance, in living animals after a bacterial infection.

Adult frogs were injected intraperitoneally with 1 ml of a suspension (10^9 bacterial/ml) of *Escherichia coli* (strain B) or *Agrobacterium tumefaciens* (strain B₆). Then 1–72 h later 1 mCi of [³H]uridine was injected, and 3 h later the RNA was extracted from the brains, the heart auricles, the ovaries and the skin. In control animals the suspension of bacteria was characterized by hybridization *in vitro* of [³H]RNA extracted from the animals with bacterial DNA. Samples of each organ were taken for radioautography and sterility tests.

Specific bacterial RNA characterized by RNA–DNA hybridization was found in all organs, even as late as 3 days after infection. The largest amount is found in the brain, which in fact is protected by natural barriers against the bacteria we have used. No bacteria were detected by radioautography. The sterility tests showed no bacteria in the brain and none or few (in too small an amount to be detected by radioautography) in other organs. The number of contaminating bacteria in auricles, ovaries and skin would not yield more than 1 part in 10^6 of the bacterial RNA extracted from these organs. Thus these bacteria cannot account for the extent of hybridization between [³H]RNA extracted from the infected frogs and the bacterial DNA. When auricles of injected frogs were extracted and treated with antibiotics before labelling *in vitro*, bacterial RNA was also found in the same amount. This last result suggests that the bacterial RNA extracted from the animal tissues has been synthesized directly in the

cells and does not come from [³H]RNA released from labelled bacteria.

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Biosynthetic Studies of Glycocalyx-Bound Glycoprotein and Glycolipid Components in Isolated Brush Borders of the Rabbit Small Intestine

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Intestinal brush borders can be regarded as highly differentiated plasma membranes that fulfil a specialized role in the digestion and absorption of foodstuffs. These functions are closely dependent on the intactness of the brush-border structure and hence may be extensively disturbed by factors that change the structure or its rate of biosynthesis. The membranes bear, on their luminal surface, a filamentous structure, the glycocalyx, which is a zone of localized digestive enzyme activity and which has a strongly positive periodic acid–Schiff histological reaction indicative of the presence of carbohydrate-containing material. A considerable body of evidence suggests that these carbohydrates form part of glycocalyx-bound enzymically active glycoproteins, which can be solubilized by papain (Eicholz, 1968) or butanol (Gitzelmann *et al.*, 1964). The present investigation is concerned with the identification of glycolipids of the glycocalyx and with their isotopic labelling, in comparison with glycoprotein components.

The presence of glycolipids in whole intestinal tissue has been demonstrated by Suzuki *et al.* (1968) and Vance *et al.* (1966), although the exact cellular origin does not appear to have been established. Brush borders have been isolated from rabbit small-intestinal scrapings by graded fragmentation in sucrose–5 mM-EDTA (D. S. Parsons, unpublished work) in 60–80% yield [in terms of invertase (β -fructofuranosidase) recovery] and with an eight- to ten-fold enrichment in invertase and lactase activities. Lysis of the brush borders in chloroform–methanol (2:1, v/v) resulted in release of glycolipid (Folch *et al.*, 1957) and denaturation of the bound enzyme. T.l.c. on silica gel G (Brady & Mora, 1970) showed the presence of five glycolipids including trisialoganglioside (GT) and disialogangliosides (GDI₁) (Svennerholm, 1963). The glycolipid fraction was shown