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Concluding remarks

As has been said above the aim of publishing these four papers under a common heading is to reveal correlations between some of the aspects dealt with and so, hopefully, to come to a better understanding of the capability of numerous arthropods to digest blood and to transmit pathogens.

So far, qualitative electron microscopy has not revealed fundamental differences in the organization of midgut cells in blood sucking vs. non blood sucking insects. Recent morphometric investigations, on the other hand, have demonstrated quantitative ultrastructural differences between epithelial cells of the anterior and the posterior part of the midgut in the female *Aedes aegypti*. The data obtained could be correlated with the physiological results available and would allow the attribution of different functions to the two parts of the midgut mentioned (HECKER et al., Cell. Tiss. Res. *152*, 31–49, 1974).

Morphometric analysis is actually being extended to compare the midgut cells of blood sucking with those of non blood sucking insects. It is to be elucidated, which cellular structures are specially involved in blood digestion, and possibly, in the transmission of pathogens. It remains to be shown whether there are representative quantitative differences between the two groups of insects concerned. So far, males and females of *Aedes aegypti* have been compared (RUDIN & HECKER, in prep.). The results showed some structural specialisations in females, which may be seen in the context of blood intake and digestion. For example, differences are found in the relative surface area (surface density) of rough endoplasmic reticulum (rer) membranes in the "stomach" cells, the values for females being significantly higher than those for males.

The rer is thought to be closely connected with enzyme production. In fact, a fairly good correlation has been shown to exist between the structural appearance of the rer and the activity of certain enzymes, mainly proteinases. It is felt, however, that concentration on proteinases may reveal only one part of the picture; in addition, attention should be paid to other enzymes which are present in gut cells and, at times, in the gut lumen, such as esterases, including those with an acetylcholine-like activity (GEERING & FREYVOGEL, Comp. Biochem. Physiol. *49*B, 775–784, 1974).

What has been said in some of these papers on vector endocrinology shows very impressively how much an insect's physiology is affected by each blood meal. To us, a thorough knowledge of the processes concerned is essential for a real understanding of the degree to which a pathogen's life cycle may be interlinked with its vector's physiology, in other words to an understanding of the host/parasite relationship.

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