

number of intact nerve fibres was considerably greater than in the kidneys of the other dogs.

Denervated left kidney: results obtained with impregnation techniques. Extensive reduction of periarterial nerves was found in all 8 cases. The motor plexus on the surface of media especially was nearly completely degenerated. Wrinkled Schwann cell nuclei with remnants of degenerated axons were found in the vicinity of the arterial wall. No degeneration was found in the myelinated fibres which are to be found in nerves surrounding large arteries. Only in dogs Nos. 4 and 6 (incomplete denervation) was the reduction of periarterial nerves less pronounced than in other cases. As to the efferent arteriole, no degeneration was observed on its fine nerve running from the afferent to the efferent arteriole through the juxtaglomerular apparatus. In the vicinity of the glomerulus this fibre is situated between the macula densa and the Goormaghtigh cells. The innervation of the efferent arteriole was found intact both in the cortical and in the juxtamedullary glomeruli (Figures 5, 6). In the latter, these fibres innervated the vasa recta. The fibres accompanying the efferent arterioles of the cortical zone ended not far from the glomeruli. Considerable reduction of all nerves was found in the fibrous skeleton of the kidney and in the vasa recta as well. Among the parallel fibres accompanying the vasa recta the thick ones showed complete and the thin irregular ones considerable degeneration. Only in case No. 4 was a small number of thick fibres found in the kidney (Figures 7 and 8).

Normal right kidney: results obtained with both methods. In the right kidney no reduction of nerves was

found either with the silver impregnation or with the fluorescence techniques. No monoaminergic nerve terminals were found in the efferent arteriole. According to the results obtained, the aorticorenal ganglion supplies the renal arteries, veins, vasa recta and the pelvic wall with sympathetic monoaminergic nerves⁹.

Zusammenfassung. Bei Hunden wurde das aorticorenale Ganglion der linken Seite herausgenommen und die Niereninnervation mit der Silberimprägnations- und der histochemischen Fluoreszenzmethode auf Monoamine nach FALCK untersucht. Auf Grund der Degenerationserscheinungen kann geschlossen werden, dass das Ganglion die Nierenarterien, das motorische Nervenengeflecht an der Oberfläche der Media, die vasa recta und Nierenbeckenwand mit adrenergischen sympathischen Nervenfasern versorgt.

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Ultrastructure of a Microorganism Associated With Bovine Platelets

Particles, presumably representing a previously undescribed microorganism, were discovered on the platelets of a splenectomized calf¹. The predominant form of the organism in Giemsa-stained smears was a delicate ring with a suggestion of light-microscopic resemblance to *Eperythrozoon*. Temperature rise was the only clinical symptom associated with peak occurrence of the agent particles. Subsequently, the agent has been passaged in 3 splenectomized calves.

The present report describes the main features observed in the ultrastructure of the agent. Blood from one of the splenectomized calves at the height of the reaction provided the material. The blood sample was processed and electron microscopy carried out as described by TUOMI and BONSDORFF², with the exception that EDTA was used as anticoagulant.

Agent particles, often in large numbers, were observed on most of the platelets (Figure 1). The number of particles on individual platelets varied widely. They seemed to be loosely attached to the platelets in general. No indications of phagocytosis of the particles by platelets were observed.

The agent exhibited pleomorphism (Figures 1 and 2). Most frequently, they were basically round yet irregular forms up to 0.4 μ in diameter. Elongated forms, up to 1.5 μ in length, were also frequently seen. They had mostly one or several constrictions. Their shape appar-

ently reflects 2 modes of reproduction: division into 2 roughly equal parts, and chain division. Evidence of budding of smaller particles was also noted.

The agent particles had no cell wall; they were bounded only by a plasma membrane (Figure 2). The inner structure presented ribosome-like granules in a ground substance of lower density. No definite nucleoid areas were observed.

In several platelet vacuoles, roundish bodies, some of them presenting very high density, were observed (Figure 1). Part of the platelets showed signs of degeneration such as disappearance of granules and reduced density.

Obviously, no very definite standpoint can be taken as regards the taxonomic position of this agent associated with bovine platelets until the question has been elucidated by results from studies employing other methods, but some clues are offered by the present findings. The size of the agent particles, their lack of cell wall, and their disorganized mode of reproduction suggest some resemblance with mycoplasmas; the first 2 characteristics also speak in favour of relationship to *Eperythrozoon* and *Haemobartonella*³.

¹ J. TUOMI, *Experientia* 22, 458 (1966).

² J. TUOMI and C.-H. v. BONSDORFF, *J. Bact.*, in press.

³ H. TANAKA, W. T. HALL, J. B. SHEFFIELD, and D. H. MOORE, *J. Bact.* 90, 1735 (1965).

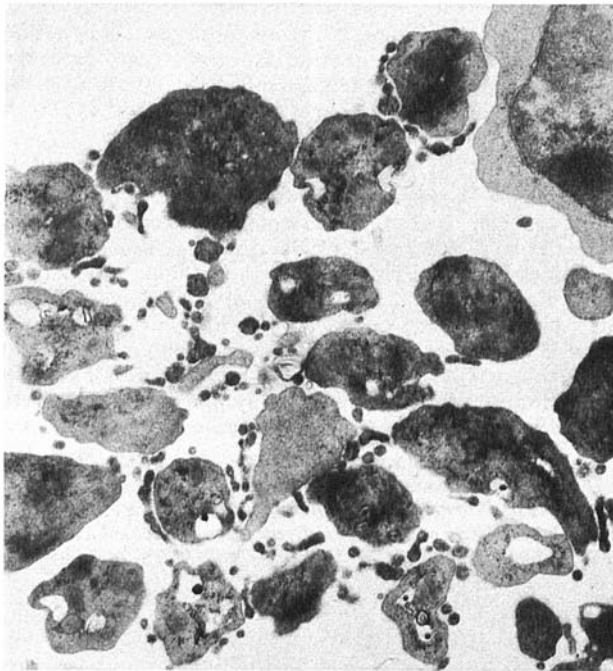


Fig. 1. Different forms of agent particles loosely attached to several platelets. Some of the platelets show degranulation and reduced density. Very dense bodies are seen within some platelet vacuoles. Part of a lymphocyte is seen in the upper right corner. $\times 7,500$.

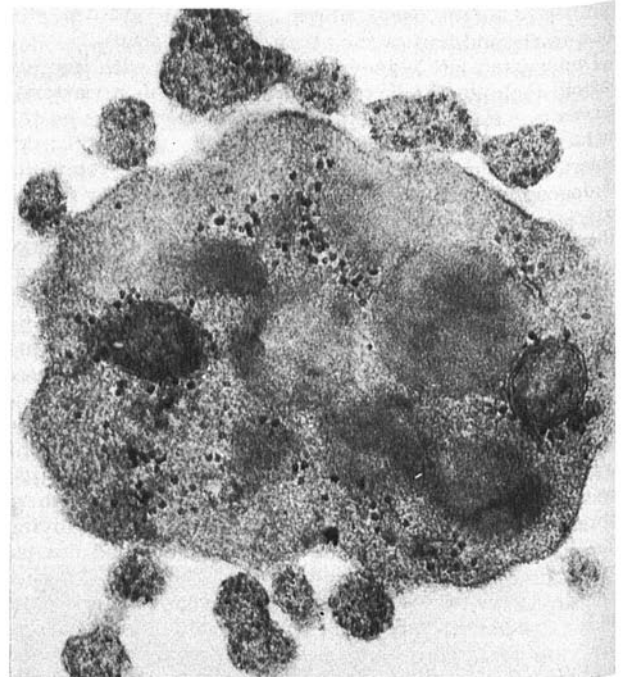


Fig. 2. Agent particles attached to a platelet. A chain form with 4 'beads' is seen above the platelet. Below this platelet, to the left of centre, a particle has almost completed its division. Ribosome-like granules are dispersed in the ground substance of the particles. The particles are bounded by a plasma membrane. $\times 46,000$.

The apparent specificity of the agent-platelet association, if confirmed, would mean discovery of a previously unrecognized relationship between microorganisms and host cells.

Zusammenfassung. Bei einem den bovinen Thrombozyten anliegenden Mikroorganismus werden elektronenmikroskopisch beschrieben: Polymorphe $1.5 \cdot 0.4 \mu$ messende Gebilde mit feiner Plasmamembran an der Ober-

fläche und ribosomenähnlichen Strukturen im Innern, die Ähnlichkeit mit Mycoplasma, Eperythrozoonen und Haemobartonellen zeigen.

J. TUOMI and C.-H. VON BONSDORFF

The Electron Microscope Laboratory, University of Helsinki, Helsinki (Finland), October 17, 1966.

Correlation Between Functional and Morphological Heart Changes Due to Isoproterenol

In experiments concerning isoproterenol-induced heart necroses (LESZKOVSKY and GÁL, to be published) the question was raised whether some alterations could be detected in the hearts damaged with isoproterenol before the appearance of histologically detectable necroses. From this point of view the observation of ECG tracings seemed not to be an appropriate method, since it is known from HILL et al.¹ that ECG changes caused by isoproterenol-induced heart necroses are considerably less marked than those due to myocardial infarctions of dietary origin. More was expected from a test with i.v. administered vasopressin, which induces hypoxia and ischaemia of cardiac muscle with corresponding ECG changes (elevation of T waves). The incidence of this phenomenon depends on the dose of vasopressin; thus

dose-effect curves can be plotted in this way (TARDOS and LESZKOVSKY²). Isoproterenol-induced heart necroses are generally believed to be the consequence of myocardial ischaemia, so it can be expected that the animals' sensitivity to a vasopressin-induced hypoxic-ischaemic state could be altered without the development of morphological alterations. Therefore it was examined whether the sensitivity of rats to vasopressin was increased by doses of isoproterenol smaller than those inducing histologically detectable necroses.

Male albino rats of an inbred colony weighing 150–250 g were used in the experiments. The animals were given 2

¹ R. HILL, A. N. HOWARD, and G. A. GRESHAM, *Brit. J. exp. Path.* 41, 633 (1960).

² L. TARDOS and G. LESZKOVSKY, *Archs int. Pharmacodyn. Thé.* 145, 293 (1963).