Results. The basal gastric acid secretion rates in the control and test rats were 2.25 ± 0.23 and 2.27 ± 0.25 μEq/10 min respectively. The difference was not significant, $P > 0.10$.

From the Table, it can be seen that the mean rates of acid secretion were higher in the test rats than in the control rats. The differences were significant for the low and high doses of synthetic human gastrin I and cow pyloric extract, $P < 0.001$ respectively, while non-significant for the low and high doses of histamine dihydrochloride $P > 0.10$, using the Student's *t*-test. The percentage increase in the mean rates of acid secretory responses obtained in the test rats to both the low and high doses of synthetic human gastrin I were 38.7 and 40.1% respectively, while those for the saline solution of cow pyloric extract were 42.3 and 36.0% respectively and for histamine dihydrochloride were 10 and 9.8% respectively.

The period of response to the i.v. injections of both the low and high doses of the saline solution of the cow pyloric extract and the synthetic human gastrin I was between 30–40 min in the control rats and between 50–60 min in the test rats. The period of response to both the low and high doses of histamine dihydrochloride was between 40–50 min in both the control and test rats.

The histamine content of the cow pyloric extract was found to be 34.4 ± 2.5 ng/mg cow pyloric extract powder using the isolated guinea-pig terminal ileum by the method of superfusion[11]. The anaesthetized rats used required a minimum i.v. dose of 8 μg histamine dihydrochloride to produce the smallest noticeable increase in acid secretion. This showed that the histamine content of the cow pyloric extract was not responsible for the increased acid secretion obtained, but the gastrin contained in the extract, since the pattern of response was similar to that obtained for the synthetic human gastrin I.

Discussion. There was no significant difference observed in the basal rate of gastric acid secretion in both the control and test rats over the 450 min collection period, which showed that the metabolites which could have accumulated in the blood of the test rats did not significantly affect their gastric acid secretion pattern. It was also observed that the mean rates of acid secretion and the periods of responses to the i.v. injected synthetic human gastrin I and the saline solution of the cow pyloric extract were lower in the rats with intact renal blood vessels (control rats) than in rats with cut renal blood vessels (test rats) which indicated that the kidneys of the rat may be involved in the inactivation and/or removal of both the synthetic human gastrin I and the cow pyloric gastrin from circulation. There was no significant difference observed in either the mean rate of acid secretion or the period of response when doses of histamine dihydrochloride were i.v. injected into the control and test rats. This work identifies the kidneys of rats, like those of the dogs[12], as an important site for the uptake of gastrin from the circulation.

Résumé. Les taux moyens de sécrétion d'acide gastrique due à l'injection par voie i.v. du SHGI et de gastrine bovine brute ont été sensiblement plus élevées et les périodes de réaction plus longues chez les rats testés que chez les rats de contrôle. Aucune différences significative n'a été observée ni dans le taux moyen de sécrétion acide ni dans la période de réaction chez les deux types de rats, après injection d'histamine dihydrochloride.

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Appearance of Lamellar Structures in the Purkinje Cells of Rat Cerebellum after Administration of β-Aminopropionitrile

Lamellar structures were scarcely observed in the nerve cells under normal conditions[1], and their physiological significance remains unsettled. Recently, the authors have frequently found a kind of lamellar structures in the specimens of Purkinje cells of rat cerebellum after treatment with β-aminopropionitrile (BAPN). This chemical is known as one of the inducers of lathyrism[2].

Materials and methods. Adult rats were given 200 mg of BAPN-fumarate by vinyl tubes. BAPN was dissolved in 1 ml of physiological saline. On the 5th and 15th days after the ingestion, the cerebellum was fixed in 5% glutaraldehyde, and postfixed in 1% osmium tetroxide buffered with cacodylate-HCl, pH 7.4. The specimens were dehydrated in ethanol and embedded in Epon 812 as usual. Fixation in glutaraldehyde was performed by perfusion. After cutting with a Porter-Blum microtome, silver sections were stained with uranyl acetate and lead acetate[3], and examined with Hitachi HU-12A electron microscope.

Results and discussion. On the 5th day after treatment, the animals were seen to reduce their movements and to become hypersensitive to mechanical stimulation from outside.

Electronmicroscopic observations on cerebellum show that Purkinje cells are somewhat swollen and contain some neurotubules, a lot of ribosomes, and round or rod-shaped mitochondria with distinct cristae. Mitochondria do not bring about any changes in shape and in electron opacity. Flattened membranous structures, presumably ergastoplasm, in the cells elongate and take on irregular forms. Some parts of them are opposed closely to mitochondria. Sometimes, 2 or 3 of those membranous structures accumulate around mitochondria and are arranged in parallel. The Golgi apparatus seems to be active and rich in vesicles (Figure 1). On the

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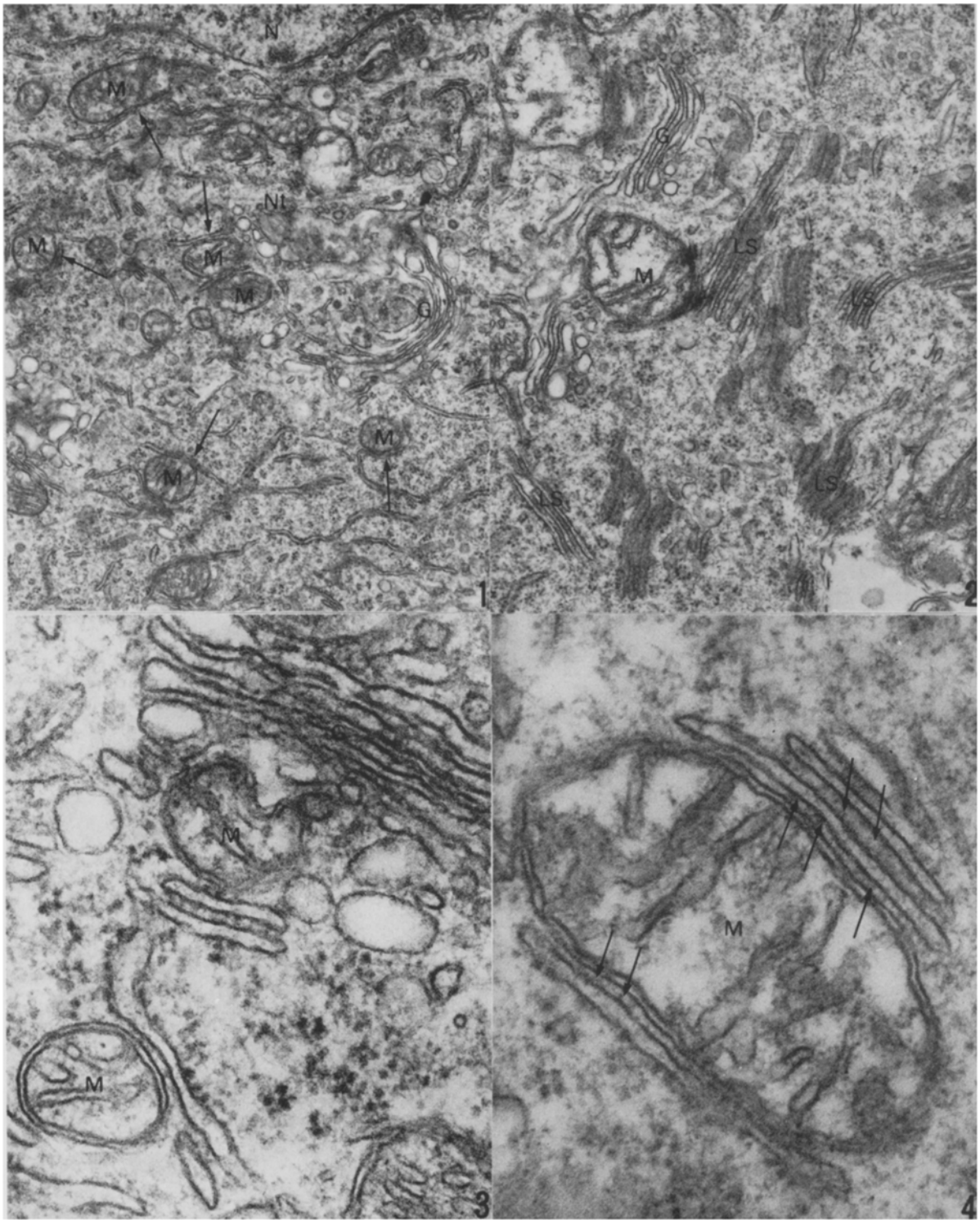

Fig. 1. Cytoplasmic organelles in the Purkinje cell. Some membranous structures are closely related to mitochondria (arrows). At 5th day after the ingestion. G, Golgi apparatus; M, mitochondrion; N, nucleus; Nt, neurotubule. ×17,000.

Fig. 2. A lot of lamellar structures (LS) composed of slender sacs appear in the cytoplasm of Purkinje cell at 15th day after the ingestion. The spaces between membranous sacs are stained dark. G, Golgi apparatus; M, mitochondrion. ×25,500.

Fig. 3. Close approximation of mitochondria (M) to saccular structures. Ribosomes diasppear on the opposed aspects of each organelle. G, Golgi apparatus. ×68,000.

Fig. 4. At either side of mitochondria (M), membranous sacs are clumped. In the regions between outer membrane of mitochondria and sacs dotted-patterns are observed (arrows). ×85,000.

15th day, Purkinje cells are round and irregular in shape. Ribosomes are scattered through the cytoplasm, and 3 to 4 membranous sacs are arranged in parallel and occasionally take the form of clusters. They may be described as a kind of lamellar structure. Mitochondria with irregular profiles are distributed randomly and cristae of them are sometimes destroyed. The membranous sacs are clumped and show swelling, and are not always related to mitochondria. Some of their cavities are filled with electron-dense material. The areas among parallelly arranged slender membranous sacs show a high electron opacity (Figure 2). High magnification of the lamellar structures reveals structural details. On opposed aspects of those clumped sacs to the other sac or mitochondria, ribosomes are not present, but the other free side of the clumped sacs is adorned with ribosomes (Figure 3 and 4). Further, the interstices between slender sac and mitochondria or the other closely associated sacs are occupied with electron-opaque material with patterns of spots or dots (Figure 5). It is interesting that the distance from one saccular structure to the other seems to be twice the diameter of the ribosome.

From these findings, it is clear that, in the initial stage of formation of lamellar structures, mitochondria are closely associated with membranous structures studded with ribosomes, and these structures lose ribosomes from their cisternal surfaces during formation of lamellar structures. The significance of these findings for the etiology of neurolathyrism is under investigation.

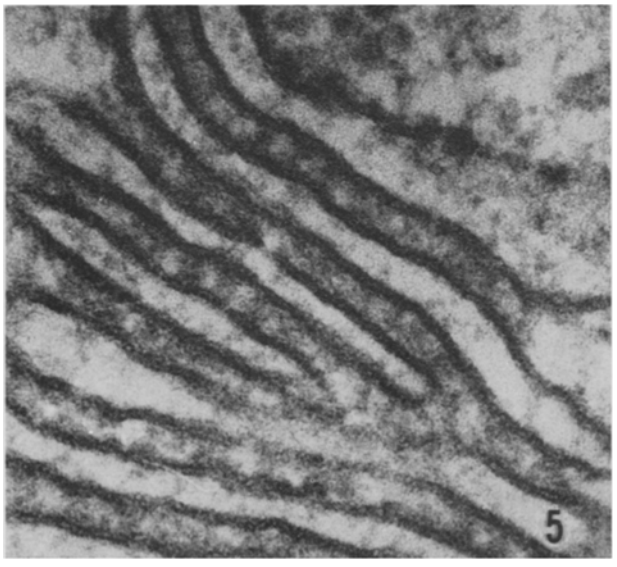

Fig. 5. High magnification of lamellar structure. The spaces speckled with high electron opacity can be seen. ×200,000.

Zusammenfassung. Nachweis, dass durch Gaben von β-Aminopropionitril die Bildung von Membransystemen in den Purkinje-Zellen des Kleinhirns induziert wird.

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The Influence of Insulin and Glucose on the Release of Plasminogen Activator by Isolated Rabbit Kidneys

In subjects with hyperinsulinemia caused by excessive or incorrect nourishment, low fibrinolytic activity and thrombosis occurance are frequent[1]. In experimental hyperinsulinemia induced by infusion of glucose or i.v. injection of the hormone, a fall of blood fibrinolytic activity was observed in rabbits[2,3]. In these experiments, results were obtained suggesting that insulin reduces the fibrinolytic activity by decreasing the level of plasminogen activators in the blood. In the present work the effect of insulin on the secretion of plasminogen activator by the kidneys was investigated.

Materials and methods. Rabbits of mixed strain, males and females, 3.0–3.5 kg weight, were used. The secretion of plasminogen activator by the kidneys was assessed under conditions resembling those already described[4]. The fluid for renal perfusion: citrate rabbit blood obtained by cardiopuncture was centrifuged at 2500 × *g* for 10 min. The erythrocyte sediment was washed 7 times in 20 volumes of 0.9% NaCl. The 40% suspension of washed

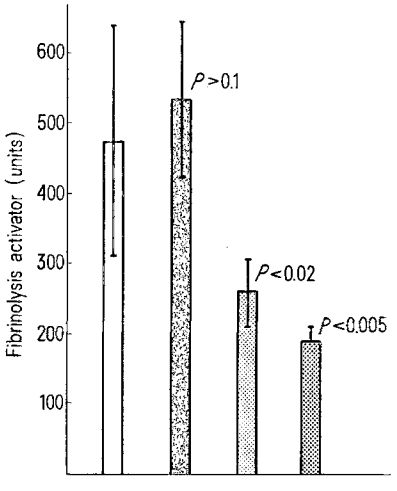

Fig. 1. Results of determination of plasminogen activator secreted into the veins and urinary tract by the kidneys under different experimental conditions. The presence of insulin in the perfusing fluid had no effect on this secretion, while addition of glucose, and particularly glucose with insulin jointly, caused considerable, statistically significant reduction in the renal secretion of plasminogen activator. □, none; ▓, insulin; ▒, glucose; ▒▓, insulin and glucose.

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