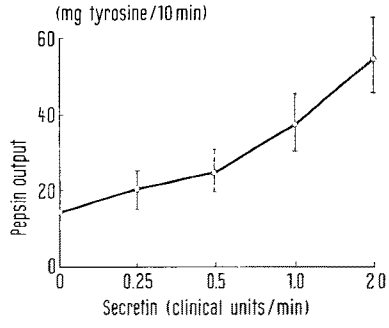
The effect of JORPES secretin (lot number 16771) on the output of pepsin has been investigated on 6 adult fasting dogs, each with a Heidenhain fundic pouch. In constructing the dose response curve, doses were changed every 30 min and the mean output of the last two 10-min-collection periods at each dose level was calculated as the response to each dose.

The Heidenhain pouch was filled with 25 ml of 0.9% saline adjusted with HCl to pH 2. This was collected and the pouch washed through with a further 25 ml of saline at the end of each 10-min-collection period. Peptic activity was determined by NORTHROP's modification[4] of the hemoglobin substrate method of ANSON[5].

The output of pepsin in response to graded doses of i.v. secretin increased progressively as the dose of secretin was increased (Figure).

BABKIN and KOMAROV[6] reported that in dogs HCl or food introduced into the intestine often stimulated pepsin secretion, whereas JANOWITZ et al.[7] showed that in man intraduodenal instillation of a variety of protein secretagogues did not augment pepsin secretion.

It is interesting to note that BUCHER and GREENGARD[8] and BABKIN and KOMAROV[6] prepared secretin which was free of pepsin stimulant although they could not isolate a pepsin stimulant itself. BABKIN and KOMAROV[6] reported that the substance or substances responsible for the pepsigogue effect were undoubtedly of a protein nature and had many properties in common with secretin. They concluded that the pepsigogue effect of crude preparations of secretin is due not to the hormone secretin but to some other substance or substances extracted from the intestinal mucosa along with it.



Dose response curve for pepsin output from the Heidenhain pouch in response to continuous i.v. secretin. Each point is the mean of 6 experiments in 6 dogs, the vertical bars represent the standard error of the mean.

In the present study it was found that the highly purified pancreozymin of JORPES and MUTT[9] (lot number 26731 and 26761), even in large doses up to 16 Crick, Harper and Raper units/min, did not stimulate pepsin secretion from the Heidenhain pouch.

It has been demonstrated that the synthetic gastrin pentapeptide is not a significant stimulant of pepsin secretion[10]. Natural hog gastrin, on the other hand, has been shown to have potent pepsigogic action in large doses[11]. It seems, therefore, that secretin may contribute to the maintenance of the pepsin secretion which continues after the cephalic phase of gastric secretion is over[12].

Zusammenfassung. Der Einfluss von Sekretin und Pankreozymin auf die Sekretion von Pepsin wurde in Hunden mit Heidenhain-Tasche untersucht. Die Hormone wurden ohne Narkose i.v. eingegeben. In allen Tieren verursachte Sekretin eine Steigerung der Pepsin-Sekretion im Magen; aber Pankreozymin hatte keinen Effekt.

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A Complex Synaptic Apparatus in Spinal Cords of Cats

GRAY[1] described axo-axonic contacts in the spinal cord of cats as the morphological basis of presynaptic inhibition. Such contacts have since been found by many authors[2]. A more complicated synaptic apparatus is described in this report.

Normal adult cats anaesthetized with nembutal were perfused with 3% glutaraldehyde in a phosphate buffer (pH 7.4) using the technique of PALAY et al.[3]. After perfusion the seventh lumbar segment was identified and transferred to the phosphate buffer. The grey matter of the ventral horn was dissected out and cut into small pieces. After washing thoroughly in the phosphate buffer, the material was transferred for 2 h to 2% osmic acid in the buffer kept at 4 °C. The tissue was dehydrated in an ascending series of alcohols and embedded in Maraglas[4]. Thin sections were stained with a lead salt[5].

During the course of an investigation of axo-axonic contacts, a complex synaptic apparatus was found in the ventral horn of the lumbar region of the spinal cord. The

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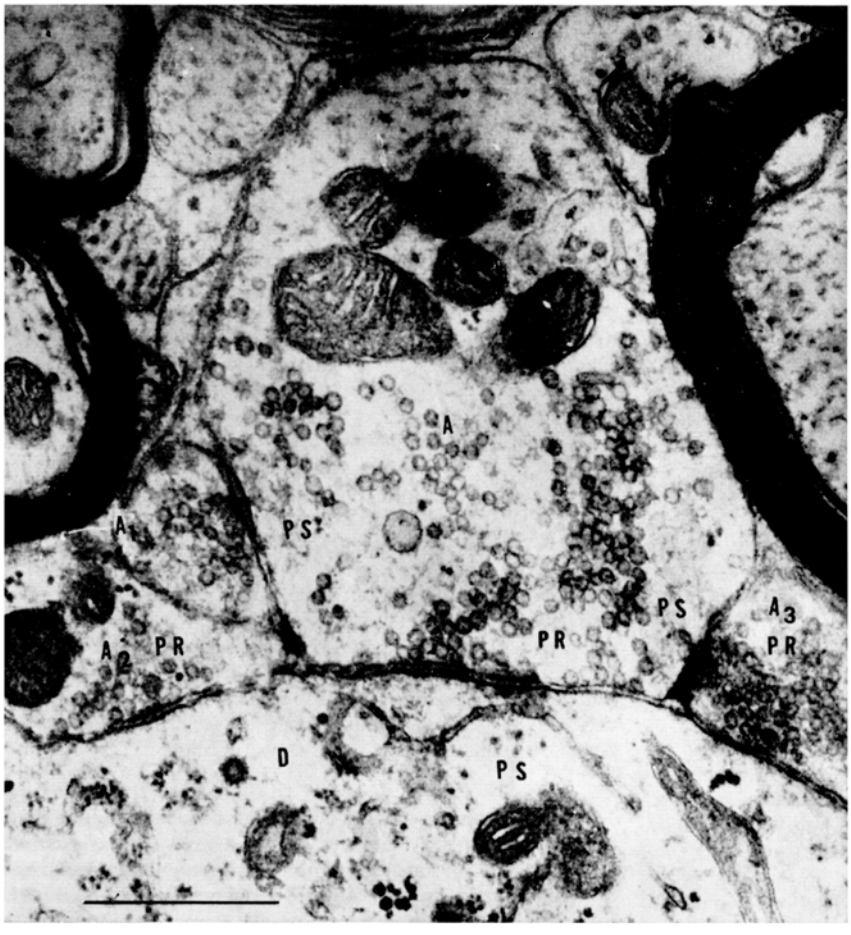

Electron micrograph of a complex synaptic apparatus from the ventral horn of the lumbar region of a spinal cord of cat. The terminals A_1, A_2 and A_3 make synaptic contact with the large terminal (A). The terminals A_1 and A_3 are considered as the presynaptic structures (PR) for the large terminal (A). This terminal (A), also behaves as the presynaptic (PR) structure for the dendrite (D). Furthermore, the terminals A_2 and A_3 are presynaptic (PR) structures for the same dendrite (D). Scale, 0.5 μ. × 62,600.

electron micrograph (Figure) shows a large axon terminal (A) making synaptic contact with a dendrite (D). On the presynaptic side synaptic vesicles are intermixed with the electron dense material at the site of contact. Furthermore the small axon terminals A_1, A_2 and A_3 make synaptic contacts with the large terminal. These small terminals exhibit all the criteria suggested for synaptic contacts[6]. In axo-axonic contacts synaptic vesicles are usually accumulated at the presynaptic membrane at the points of contact with the postsynaptic terminal[7]. The terminals A_1 and A_3 can therefore be considered presynaptic structures for the terminal A which is in turn the presynaptic structure for the dendrite (D). At the same time the terminals (A_2 and A_3) seem to function as presynaptic elements for the dendrite (D). A similar complex synaptic apparatus has been reported in the cerebellum and the lateral geniculate body[8]. The function of such a synaptic apparatus is highly complicated and forms a challenge to the neurophysiologists.

Both terminals in axo-axonic contacts observed in several areas of the central nervous system (spinal cord, reticular formation of both medulla and mesencephalon, cerebellum, cerebral cortex, hippocampus and thalamus of rabbits) contained spherical vesicles to which an excitatory activity has been ascribed in contrast to elipsoidal vesicles which would contain a transmitter active in postsynaptic inhibition[9]. The spherical vesicles in axo-axonic contacts are in agreement with the mechanism proposed for presynaptic inhibition[10], namely the depolarization of the presynaptic terminal upon which these contacts impinge[11,12].

Zusammenfassung. Es wird ein komplex-synaptisches System im Katzenrückenmark von komplizierter Funktion beschrieben. Beide Nervenendigungen in den axo-axonischen Kontakten verschiedener Teile des Zentralnervensystems haben runde Vesikel mit offenbar stimulierender Aktivität.

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