

glycoprotein, which is destroyed by such alkaline treatment and does not support growth of B_{12} -requiring microorganisms. Further studies are currently underway to purify ARF and to elucidate its relationship to B_{12} , folic acid and nucleic acids.

Résumé. Un facteur, résistant à l'alcali et thermostable, peut être extrait du sérum de l'homme, du foie de bœuf et des bactéries thermophiles. Ce facteur ressemble à la vitamine B_{12} par son activité chez le protozoaire et l'homme. Il peut résister 30 min à la temp. de 118–121°C en auto-

clave, dans un milieu contenant l'alcali, pH 11.5–12. Ce facteur caractéristique est distinct de la vitamine B_{12} , de l'hydroxycobalamine, de la coenzyme B_{12} , de l'acide folique, de l'acide folinique, et de l'érythropoïétine.

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C Fibre Innervation of a Mechanoreceptor

Pacinian corpuscles are innervated by a myelinated axon of large diameter, the well-known mechano-receptor axon of the sense organ. In the present paper a second axon of small diameter will be described innervating the corpuscle.

Pacinian corpuscles were isolated from the cat's mesentery together with a length of their nerve supply and set up in a bath of Krebs's solution covered with mineral oil. Electrical stimulation of the nerve supply elicits an action potential that is conducted at 35 m/sec (28°–32°). This corresponds to an A fibre of about 6 μ diameter, and agrees well with the diameter of the large fibre determined histologically. When the stimulus strength is raised by a factor of 3 to 6 (duration 0.25 msec), a second action potential of much smaller amplitude and conduction speed (mean, 0.7 m/sec) appears (Figure). The fast

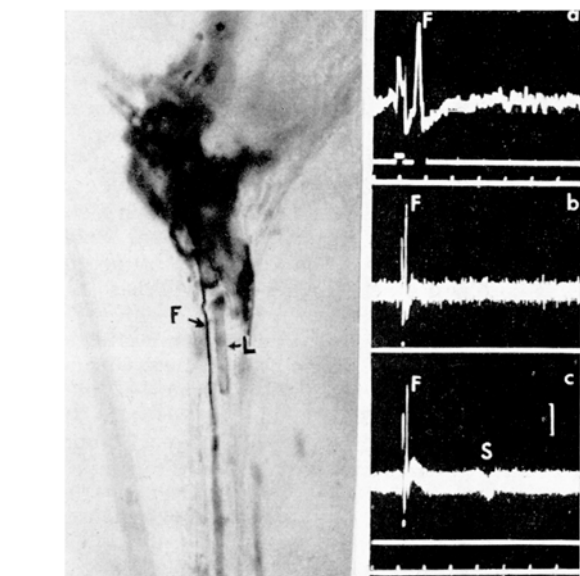
potential is clearly the impulse of the large myelinated axon of the sense organ: a potential produced in response to mechanical stimulation of the mechano-receptor ending of the large fibre (orthodromic impulse) is identical with the electrically excited fast potential (antidromic impulse). The slow potential is conducted in a separate axon and not merely in a finer branch of the large one, for when ortho- and antidromic impulses are timed to collide along their mesenteric or intra-corporal course, abolition of the impulses occurs, while the slow impulse runs through unchanged. The conduction velocity and the amplitude of the slow potential indicate that it is conducted in a very small non-myelinated C fibre. We have traced this fibre into the corpuscle. For this purpose the lamellae of the corpuscle were removed by dissection up to the inner core. This frees a length of intra-corporal nerve supply of about 500 μ for electrical recording, allowing one to trace part of the course of the small fibre inside the corpuscle. (As has been shown in earlier work, the mechano-receptive properties of such a decapsulated preparation are unimpaired¹.) With the recording electrode placed where the nerve supply normally enters the corpuscle, and another one at the height of the first internode of the large fibre which normally lies in the proximal portion of the corpuscle, the small fibre impulse is recorded as a biphasic potential, showing that it is conducted for some length inside the corpuscle.

The small fibre was also traced by histological means. Both Bodian stained sections and methylene blue stained whole mounts of corpuscles show evidence of a fine nerve fibre that parallels the myelinated axon in the stalk and in at least the proximal segment of the corpuscle.

Zusammenfassung. Pacinische Körperchen besitzen eine doppelte Innervation. Ausser der bekannten markhaltigen mechanorezeptorischen Faser (A-Faser, Übertragungsgeschwindigkeit 35 m/sec) tritt noch eine feine marklose Faser (C-Faser) in das Körperchen ein. Die C-Faser lässt sich mit elektrophysiologischen und histologischen Methoden in den mesenteralen Nerven, im Stiel des Pacinischen Körperchens sowie in seinem Innern (Proximalsegment) nachweisen.

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Dual innervation of a Pacinian corpuscle. Left, corpuscle (total mount) stained vitally with methylene blue. A small unmyelinated fibre (F) parallels the large myelinated fibre (L) in the stalk of the corpuscle. Right, the impulses of the small and large fibres. a, b, electrical stimulation of threshold strength of the corpuscle's nerve supply elicits an impulse in the large fibre (F); and c, in addition another more slowly conducted impulse (S) in the small fibre when the strength is increased. Second beam from top signals stimulus.

Calibration 25 μ V; time in a, 1 msec, in b and c, 5 msec.

¹ W. R. LOEWENSTEIN, *Ann. N. Y. Acad. Sci.* 81, 367 (1959).