

insulin was also examined. The inactivation of insulin was carried out according to the method of DU VIGNEAUD *et al.*²⁰. The inactivated insulin which lost its blood-sugar-lowering effect was also ineffective in stimulating granulation tissue formation (Table). In this experiment the control pellets were impregnated with the cysteine solution used in the inactivation procedure. To avoid any possible loss of insulin, no attempt was made to separate insulin and cysteine after the reduction of insulin was accomplished.

The granulation tissue-stimulating effect of insulin is also apparent in the adrenalectomized animal (Table). The implantation of the pellets was carried out 4 days after adrenalectomy. The animals received 1 mg cortisol intramuscularly 24 and 48 h after adrenalectomy. The presence of the granulation tissue-stimulating hormone of the adrenal cortex, aldosterone⁵ is therefore not necessary for the insulin effect.

Preliminary experiments carried out on hypophysectomized animals suggest that the presence of the hypophysis is also not necessary for the insulin effect. In accordance with the data in the literature, we found a diminished production of granulation tissue in hypophysectomized rats.

The mechanism and significance of the granulation tissue-stimulating effect of insulin is not known. In our experiments, we succeeded in demonstrating a local effect of a highly purified insulin. This would suggest that the effect is specific. Decreased production of granulation tissue in the diabetic organism, among other factors^{21,22}, may play a role in the diminished resistance to infection and delayed wound healing.

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S. NAGY, A. RÉDEI, and S. KARÁDY

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Zusammenfassung

Mit dem Fremdkörpergranulomtest wurde festgestellt, dass lokal appliziertes Insulin die Bildung des Granulationsgewebes bei der Ratte fördert. Inaktiviertes Insulin bleibt ohne Effekt. Die Insulinwirkung findet auch in Anwesenheit des Wachstumshormons statt.

²⁰ V. DU VIGNEAUD, A. FITCH, E. PEKAREK, and W. W. LOCKWOOD, *J. biol. Chem.* **94**, 233 (1931/32).

²¹ L. JUHLIN, *Acta physiol. scand.* **45**, 369 (1959).

²² B. K. FORSCHER and H. C. CECIL, *J. appl. Physiol.* **13**, 278 (1958).

Spinal Afferent pathway of the Tactile Placing Reaction

In most textbooks of physiology, the view is held that tactile discrimination depends on dorsal column pathways and to some extent also on the crossed spino-thalamic tract. The assumption has been that the most highly

discriminative tactile functions are subserved by the dorsal column pathway. However, it has been demonstrated that in cat evoked potentials in the somatic sensory areas remain after section of the dorsal column, but disappear after a lesion in the dorsal part of the lateral funicle¹.

Tactile placing is a cortical reflex requiring a high degree of spatial sensory discrimination. In the present experiments we have tested tactile placing in the cat's hindlimb, after lesions in the spinal cord had been made to interrupt different ascending pathways. Complete section of the dorsal column does not interfere with tactile placing but ipsilateral tactile placing was entirely abolished after a small superficial lesion in the medio-dorsal part of the lateral funicle. It is possible that this lesion in the lateral funicle may have interrupted a small fraction of pyramidal fibres, but several findings indicate that the loss of placing is not due to a motor deficiency; the cats did not show any defects in movements and visual placing could be performed accurately. There was no loss of the placing reaction in either hindlimb after a large lesion in the ventral quadrant interrupting pathways with the classical location of the spino-thalamic tract.

It is therefore concluded that the afferent link of the placing reaction is an uncrossed pathway in the medio-dorsal part of the lateral funicle.

Electrophysiological experiments have demonstrated the existence of eight pathways in the dorsal part of the lateral funicle, five of which are functionally independent subdivisions of the dorsal spino-cerebellar tract². One of these non spino-cerebellar pathways is activated exclusively by low threshold cutaneous afferents, the discharge being adequately elicited by very light touch from an extremely restricted receptive field. The axons of this pathway are located medially to those of the dorsal spino-cerebellar tract². Disappearance of tactile placing was found after a medial lesion interrupting the axons of this pathway but leaving the majority of the dorsal spino-cerebellar axons. On the other hand, there was no loss of tactile placing after a more laterally placed lesion, which interrupted the majority of the dorsal spino-cerebellar axons sparing the more medially located exteroceptive pathway.

It is assumed that this ascending pathway is the afferent link of the tactile placing reaction.

A. LUNDBERG and U. NORSELL

Institute of Physiology, University of Lund (Sweden), October 29, 1959.

Zusammenfassung

Die exterozeptive Aufsetzreaktion der Hinterpfote der Katze nach verschiedenartigen Rückenmarksverletzungen ist untersucht worden. Nach Entfernung des Hinterstranges bleibt dieselbe erhalten, sie verschwindet nach oberflächlicher Verletzung im medialen dorsalen Teil des Seitenstranges. Es wird angenommen, dass eine in diesem Rückenmarksteil verlaufende exterozeptive Bahn der afferente Schenkel der Aufsetzreaktion ist.

¹ F. MORIN, *Amer. J. Physiol.* **133**, 245 (1955). – J. V. CATALANO and G. LAMARCHE, *Amer. J. Physiol.* **189**, 141 (1957).

² A. LUNDBERG and O. OSCARSSON, *Exper.* **15**, 195 (1959) and unpublished observations.