The β-Receptors in the Rat Pancreas

The stimulatory effect of isoproterenol (ISO) perfusion, a predominant β-stimulatory agent, upon insulin secretion in human beings has been reported by PORTE[1,2]. This stimulation was not accompanied by any hyperglycemia. MALAISSE et al.[3,4] have reported the effect of this drug in vitro, describing a blocking or stimulating action. The latter was obtained only when an α-blocking agent and glucose in a concentration of at least 100 mg/100 ml ($0.6 \times 10^{-2} M$ glucose) were present in the incubation medium together with ISO. The present investigation is intended to determine whether the pancreas response to ISO could be obtained under different experimental conditions as the previously reported.

Slices of rat pancreas (norvegicus male rats of about 100–150 g body weight) were incubated following a technique described in some previous reports[5]. After an equilibration period of 30 min in Krebs Ringer bicarbonate buffer (pH 7.4) with $0.3 \times 10^{-2} M$ glucose at 37 °C, the pancreas slices were placed in incubation flasks with 3 ml of the same buffer and incubated with continuous gassing, using a mixture of 95% oxygen and 5% carbon dioxide during 15 min (baseline). After this period, the slices were transferred to a second incubation medium (stimulation) with (a) $1.7 \times 10^{-2} M$ glucose or (b) $0.3 \times 10^{-2} M$ glucose plus 8.07×10^{-4} mM ISO. Release of insulin into the incubation medium (baseline and stimulation) was determined by the immunoassay method of HERBERT[6].

The results are summarized in the Table. In all cases the amounts of insulin are expressed in μU/mg of tissue/15 min.

These results show that when glucose in the medium increases from $0.3 \times 10^{-2} M$ to $1.7 \times 10^{-2} M$ a significant stimulation of the release of insulin from the pancreas was obtained. ISO, in the above mentioned concentration, was able to elicit an insulin response similar to the one observed with high glucose concentration.

On the basis of these results, several conclusions may arise: (a) the existence of β-receptors in the rat pancreas; (b) these receptors can be stimulated by ISO in the presence of low concentrations of glucose and in abscence of α-blockers; (c) release of insulin is obtained as a result of the stimulation of β-receptors[7].

Pancreas response. Insulin expressed in μU/mg tissue/15 min

Baseline	Response (test substance added)		Δ	P
$0.3 \times 10^{-2} M$ glucose	$1.7 \times 10^{-2} M$ glucose	$0.3 \times 10^{-2} M$ glucose + 8.07×10^{-4} mM ISO		
22.0 ± 2.1 (9)	41.0 ± 3.2 (9)		+ 19.0	< 0.01
21.2 ± 2.6 (7)		35.6 ± 1.9 (7)	+ 14.4	< 0.01

Figures represent mean value ± S.E.M. No. of cases in brackets.

Resumen. Se estudió el efecto del isoproterenol (ISO) sobre la secreción de insulina in vitro. Los resultados indican que el ISO es capaz de estimular la secreción de insulina en forma similar a la glucosa en altas concentraciones.

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Distribution of Noradrenaline in the Genital Organs of the Female Rat with a Remark on Dopamine in the Cervix and Vagina

Recent investigations have revealed a distinct adrenergic innervation to the different female reproductive organs of several mammals, e.g. rabbit[1], cat[2], guinea-pig[3] and human female[4]. Furthermore, a considerable variation of the amount of adrenergic innervation to various parts of the female genital tract has been demonstrated[5]. In contrast to the species mentioned, the female rat has been reported to receive adrenergic innervation to the genital organs almost exclusively as blood vessel innervation[6,7]. However, histochemical findings have indicated that at least the isthmic part of the rat oviduct may receive adrenergic nerves to the smooth muscular wall as well[6,8]. Because of this finding it seemed to be of interest to make a quantitative estimation of the adrenergic innervation to various parts of the female rat genital tract by determination of their noradrenaline (NA) content.

Material and methods. 60 adult female Sprague-Dawley rats weighing 180–250 g were used. No determination of the stage of estrus cycle was performed since it has been

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