workers[18,19]. More recently, METZENBERG *et al.*[5,20] denied this possibility and further concluded that ammonia did not take part in the first phase of the catalysis, a view also shared by JONES[21].

Thus, free carboxyl groups are prerequisite for the catalytic action of acetylglutamic acid; further, since the carbon-bonded hydrogen atoms do not take part in the catalysis[22], the reactivity of acylglutamic acid seems to be associated with its substituted amino group.

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Hexose monophosphate pathway in pituitary tissue

Few studies have been made on glucose catabolism in the pituitary. Rat pituitary is characterized by a high endogenous respiration, which is unaffected by the presence of glucose or succinate in the medium[1,2]. The concentration of the enzymes of the tricarboxylic acid cycle is significantly smaller than in liver[2].

An active hexose monophosphate pathway has been demonstrated in the adrenals[3], in the testis[4], and in the thyroid[5], and the hypothesis has been suggested that this might be a common property of endocrine tissues. The present study presents evidence for an active hexose monophosphate pathway in beef pituitary.

The experimental methods were the same as those previously reported. The

recorded isotopic values (Table I) have been corrected to the initial specific activity of [1-^{14}C]glucose.

As shown in Table I, there is a preferential oxidation of the C-1 in contrast to the C-6 of glucose by beef pituitary. The ratio of $^{14}CO_2$ evolved from [1-^{14}C]glucose to that from [6-^{14}C]glucose is approx. 3 after 30, 60, and 90 min incubation. If glucose were metabolized *via* the glycolytic and citric acid pathway, a ratio of 1 would have been observed as in muscle. There is thus good evidence for the existence of an active hexose monophosphate pathway in pituitary tissue.

TABLE I

OXIDATION OF [1-^{14}C]GLUCOSE AND [6-^{14}C]GLUCOSE BY BEEF PITUITARY

Each flask contained 4 ml of Krebs-Ringer bicarbonate buffer (pH 7.4), 52.8 μmoles glucose and approx. 90 mg of tissue slices (dry wt.), equilibrated with 95 % O_2, 5 % CO_2. Specific activity of glucose was 0.023 C/mole glucose.

Tissue	*Incubation time (min)*	*Specific activity* of CO_2 formed from*		*Ratio C-1/C-6*	*Number of experiments*
		[1-^{14}C]glucose	*[6-^{14}C]glucose*		
Beef pituitary	30	0.494 ± 0.240**	0.155 ± 0.121**	3.19	8
Beef pituitary	60	1.922 ± 0.565**	0.840 ± 0.290**	2.29	8
Beef pituitary	90	3.709 ± 0.591**	1.219 ± 0.482**	3.04	6
Rat diaphragm	90	19.7	23.7	0.83	1

* Specific activity in counts/min/mg $BaCO_3$/mg tissue (dry wt.).
** Standard deviation.

The steadiness of the C-1/C-6 ratio permits the assumption that this ratio at zero time was close to 3. Assuming that the triose phosphates are freely interconvertible, that there is no randomization of C-1 to C-4, C-5, or C-6, and that the rate of formation of CO_2 is higher from C-1 than from C-2 and C-3 in the hexose monophosphate pathway, it is possible to evaluate grossly[6] that 25 % of the CO_2 produced from glucose comes via this pathway.

It is of interest to point out that both thyroid and pituitary tissues have a low concentration of the enzymes of the tricarboxylic acid cycle[2,7], and an active hexose monophosphate pathway[5].

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