

Specific radioactivity in the TCA soluble and in the protein fraction of foetus, maternal liver and pancreas after intravenous injection of C¹⁴-*para*-fluorophenylalanine in pregnant mice

Mouse	Time after administration of C ¹⁴ - <i>para</i> -fluorophenylalanine	TCA soluble radioactivity		Cpm/mg dry weight maternal pancreas	Protein bound radioactivity		
		foetus	maternal liver		foetus	maternal liver	maternal pancreas
1	15 min	1826	2800	3256	750	2366	3427
2	1 h	1163	920	890	982	2325	8310
3	4 h	507	560	332	2630	2794	8426
4	24 h	51	160	279	2176	2124	2366

sively defluoridated in the body, but earlier findings^{2,8} indicate that defluoridation of *p*-fluorophenylalanine occurs only to a very low extent. The great difference in *p*-fluorophenylalanine and ethionine which has appeared does not seem to be explainable by the differences in relation between the injected doses of the analogues and the body pool of corresponding free natural amino acid. The most probable explanation seems to be the degree of discrimination of the antimetabolite during the competition with the corresponding natural amino acid. *p*-fluorophenylalanine seems to resemble its corresponding natural amino acid more than does ethionine in its tendency to become incorporated into proteins, which may possibly be explained by stereostructural relationships⁹.

Zusammenfassung. Trächtigen Mäusen wurde 2 Tage vor dem Ende der Schwangerschaft 3-C¹⁴-*para*-Fluorphenylalanin, eine dem Phenylalanin analoge Aminosäure, i.v. injiziert. Die Verteilung der Substanz im Organismus und ihr Einbau in die Proteine wurde gleichzeitig autoradiographisch und chemisch untersucht.

Aus den Autoradiogrammen geht hervor, dass *para*-Fluorphenylalanin im Organismus wie eine normale Aminosäure verteilt wird. Die chemischen Untersuchungen zeigen, dass ein grosser Teil der Substanz in die Proteine eingebaut wird.

Wir schliessen daraus, dass sich *para*-Fluorphenylalanin im Stoffwechsel gleich oder sehr ähnlich verhält wie die physiologisch vorkommende Aminosäure Phenylalanin.

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⁸ R. MUNIER and G. N. COHEN, *Biochim. biophys. Acta* 31, 378 (1959).

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Action of Sodium pyruvate upon Nucleated and Enucleated Fragments of the Parasitic Ciliate *Opalina ranarum*

Sodium pyruvate has a remarkable cytolysing effect upon enucleated fragments of *Amoeba proteus*, in contradistinction to nucleated fragments¹. As we obtained similar results with *Stentor coeruleus*², it was desirable for us to perform a corresponding investigation with the parasitic Ciliate *Opalina ranarum* to establish whether we are possibly concerned with a phenomenon of more general importance. For this purpose the specimens immediately after removal from the intestine of the frog *Rana esculenta* were cut into nucleated and enucleated fragments with a glass needle. As in *Amoeba*¹ and *Stentor*² whole cells of *Opalina* as well as nucleated fragments were found to tolerate concentrations of sodium pyruvate of up to 2.5×10^{-3} mM/ml for 24 h without appreciable changes in movement or morphology. Within the first 10 h exposure to this concentration about 90% of the enucleated fragments were cytolysed. The synthesis of ribonucleic acid and protein is dependent on the nucleus and consequently the increased toxicity of the sodium pyruvate to the enucleated halves might reflect an intracellular increase in lactic acid, caused by a change in the reduction of the diphosphopyridine nucleotide diphosphopyridine ratio as a result of insufficient consumption of chemical bound

energy^{3,4}. BRACHET demonstrated a similar increase in sensitivity of the enucleated fragments towards natural precursors of nucleic acid and proteins⁵. As the results obtained in the parasite *Opalina* correspond very well with the findings obtained in *Amoeba*¹, *Stentor*², and *Acetabularia*⁵, the cytolysing action of sodium pyruvate should probably be considered to be of more general importance.

Zusammenfassung. Natrium-Pyruvat zeigt eine cytolytische Wirkung auf enukleierte Fragmente der schmarotzenden Ciliate *Opalina ranarum*.

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¹ E. GUTTES and S. GUTTES, *Nature* (London) 187, 432 (1960).

² A. STOLK, *Naturwiss.* 48, 390 (1961).

³ B. CHANCE, *Enzymes: Units of Biological Structures and Function* (Ed. by O. H. GAEBLER, Academic Press, New York 1956).

⁴ H. A. LARDY, *Proc. Third Internat. Congr. Biochem.* Brussels, 1955 (Ed. by C. LIÉBECQ, Academic Press, New York 1956).

⁵ J. BRACHET, *Exp. Cell Res.* 14, 650 (1958).