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Biological Synthesis of Acetylcholine.

H. C. CHANG, L. Y. LEE, C. W. MENG AND Y. K. WANG.

From the Department of Physiology, Peiping Union Medical College, Peiping.

It was demonstrated that on incubation of the human placenta at a favorable temperature, *viz.*, 37-38°C, there is an increase of acetylcholine (AC) reaching a maximum at the 4th hour.¹ In view of the fact that no such increase occurs during incubation, if the tissue has been soaked in alcohol, or if the eserine (Es) saline extract of the tissue is incubated, the presence of an intracellular factor ("acetylizing endoenzyme") was postulated.²

It was later claimed that the action of the cholinesterase may be reverted by Es or body temperature, for the washed tissue which is almost free of the cholinesterase does not show the AC synthesis as the unwashed tissue does.³ Sodium fluoride, quinine, prostigmine and berberine were found to have a similar action as Es.⁴

The suggestion of the intracellular factor was soon reinforced because certain forms of physical injury, such as grinding, freezing, and air-drying, applied to the placental tissue, destroy the intracellular factor, leaving the cholinesterase intact. Such tissue does not show AC-synthesis when incubated at 37.5°C or when Es is added. Similarly, cyanide kills the intracellular factor but spares the cholinesterase, and this cyanide-treated tissue fails to produce more AC in response to Es or the incubation at 37.5°C.⁵

Now it is possible to show that both factors appear to act together for the biological synthesis of AC in the presence of Es.

It is known that the pressed juice of the placenta contains the cholinesterase but not the intracellular factor, while the placental tissue which has been thoroughly washed by an intraarterial saline infusion contains chiefly the intracellular factor with only a trace of the cholinesterase.⁵

As shown in Table I, which gives 2 typical experiments of a series, the AC of the juice or the washed tissue is not changed by Es. But

¹ Chang, H. C., *Proc. Soc. Exp. Biol. and Med.*, 1935, **32**, 1001.

² Chang, H. C., *Proc. 8th Annual Meeting of the Chinese Physiol. Soc., Peiping*, 1935, 7.

³ Chang, H. C., Lee, L. Y., and Meng, C. W., *Chinese J. Physiol.*, 1940, **15**, 343.

⁴ Chang, H. C., Lee, L. Y., and Meng, C. W., *Chinese J. Physiol.*, 1941, in press.

⁵ Chang, H. C., Lee, L. Y., Meng, C. W., and Wang, Y. K., *Chinese J. Physiol.*, 1941, in press.

TABLE I.
Action of Cholinesterase and an Intracellular Factor in Synthesis of AC.

Samples*	Total AC in γ †		% destruction of added AC‡ by cholinesterase in 10 min.	
	I	II	I	II
5 g washed tissue	216.0	152.0	5	15
5 g washed tissue + 150 γ Es	262.0	166.5	0	0
5 cc juice	1.7	1.6	82+	55
5 cc juice + 150 γ Es	1.7	1.7	0	0
5 g washed tissue + 5 cc juice	185.0	120.6	—	38
5 g washed tissue + 5 cc juice + 150 γ Es	559.8	361.7	—	0

*Three hours are allowed for the action to proceed in all the samples before the extraction.

†Assayed on the rectus as AC-chloride according to Chang and Gaddum.⁶

‡Assayed on the rectus according to Meng.⁷

when the juice is added to the washed tissue in the presence of Es, the AC-yield is very much increased, indicating clearly the collaboration of the two factors in the biological synthesis of AC.

Further experiments are in progress to determine the nature of the intracellular factor and to search for the source of the substrate concerned in this synthesis.

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Recovery of Antibody from Immune Precipitate of Type B Friedländer Bacillus.

SZU-CHIH LIU AND HSIEN WU.

From the Department of Biochemistry, Peiping Union Medical College, Peking, China.

In previous reports¹ from this laboratory, it has been shown that free antibody can be recovered from the immune precipitate or agglutinate of Type I pneumococcus by treating with dilute acid which causes a shift of the antigen-antibody equilibrium. The present communication extends our observation to the immune precipitate of another organism, Type B Friedländer bacillus.

⁶ Chang, H. C., and Gaddum, J. H., *J. Physiol.*, 1933, **79**, 255.

⁷ Meng, C. W., *Chinese J. Physiol.*, 1940, **15**, 143.

¹ Liu, S. C., and Wu, H., *Chinese J. Physiol.*, 1938, **13**, 449; *ibid.*, 1940, **15**, 465; *Proc. Soc. Exp. Biol. and Med.*, 1939, **41**, 144; *ibid.*, 1940, **43**, 747; Lee, K. H., and Wu, H., *Proc. Soc. Exp. Biol. and Med.*, 1940, **43**, 65.