

Reversibility of the Inactivation of Rous Sarcoma Extracts by Detergents

THE infectivity of an aqueous extract from a Rous sarcoma is lost if cetyl trimethyl ammonium bromide ('Cetavlon'), a cationic detergent, is added to the active extract¹. By further addition of an acid colloid substance, like ribonucleic acid² or heparin, to the non-infective system infectivity is restored.

From the results obtained by Pirie and co-workers³⁻⁶ on some plant viruses, including the tobacco mosaic virus, treated with anionic detergents, and by Pfankuch and Kausche⁷ on tobacco mosaic virus with cationic detergents, the mechanisms of the actions of the two types of detergents on tobacco mosaic virus appear to be different. We have explored the possibility of an analogous behaviour of Rous sarcoma extract towards the two types of detergent, with particular reference to the reversibility of inactivation. The results are given in Tables 1 and 2.

The extract was prepared with a Miller and Golder's buffer⁸ 0.14 M, pH 7.0. The initial concentration of extract was 5 per cent. After centrifuging at 1,500 g for 60 min., hyaluronidase, 5 U.V./ml. (Ialovis Vister) was added as solubilizer, and after 30 min. the extract was centrifuged at 15,000 g. All operations were carried out at 3° C.

In the experiments with 'Cetavlon' the proportion detergent/infective extract, was 2 mgm./ml., and the amount of acid colloid (heparin) needed to restore infectivity was equal by weight to the amount of 'Cetavlon'. In the experiments with the anionic detergent (sodium lauryl sulphate), the proportions were 0.4 mgm./ml., and the amount of basic colloid (protamine) added was equal to the weight of anionic detergent. Inoculations (standard amount, 2 ml.) were made in the breast muscles of 8-week-old chickens, all from the same breed. They were killed between the thirteenth and fifteenth day of the experiment, at which time the first control animals were beginning to die.

It appears from the results obtained that, whereas the cationic detergent has a reversible action, as is shown by the restoration of infectivity in the inactivated system (extract + 'Cetavlon'), such a

reversibility does not occur with the anionic detergent, even after addition of a basic colloid, like protamine.

DINO GUERRITORE

Istituto Regina Elena
per lo studio dei tumori,
Divisione Scientifica,
Viale Regina Elena 291.
Rome.

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⁷ Pfankuch, E., and Kausche, G. Z., *Biochem. Z.*, **312**, 72 (1942).

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Effect of Creatine Phosphate Administration on the Cardiac Adenosine Triphosphate of Thyroxinized Rats

THE amounts of adenosine triphosphate, creatine phosphate and inorganic phosphorus in the heart of hyperthyroid animals are below normal. These amounts are restored to about the normal level by administration of adenosine triphosphate, whereas with cocarboxylase and organic phosphates restoration is incomplete¹. Moreover, thyroxin intoxication reduces the creatine content of the skeletal muscle and the rate of creatine synthesis by liver².

We have sought to establish if creatine phosphate, which is essential in oxidative phosphorylation, affects the reduction of this process in the heart, induced *in vivo* by thyroxin in doses of 0.01 mgm. per animal.

0.01 mgm. D,L-thyroxin was daily injected intramuscularly into each of twenty-four rats, which were then divided into four lots. Lot B received no further treatment; lot C daily received 0.1 mgm. of buffered creatine phosphate per animal injected intramuscularly; lot D received daily 5 mgm. of buffered creatine per animal, injected intramuscularly; the rats in lot E each received a single injection of both creatine phosphate and creatine at the same doses as above. A fifth lot (A) of normal animals was used as control. After fifteen days the animals

Table 1. INACTIVATION AND REACTIVATION OF EXTRACTS FROM ROUS SARCOMA TREATED WITH CATIONIC DETERGENT ('CETAVLON')

Extract + heparin				Extract + 'Cetavlon'				Extract + 'Cetavlon' + heparin			
Inoculations in chickens	Developed tumours	Positive inoculations (per cent)	Mean weight developed tumours (gm.)	Inoculations in chickens	Developed tumours	Positive inoculations (per cent)	Mean weight developed tumours (gm.)	Inoculations in chickens	Developed tumours	Positive inoculations (per cent)	Mean weight developed tumours (gm.)
28	25	89	28	57	20	35	5	30	26	86	16

In the control chickens the ratio, developed tumours/inoculations was 70/76, with a positive inoculation of 92 per cent.

Table 2. INACTIVATION AND REACTIVATION OF EXTRACTS FROM ROUS SARCOMA TREATED WITH ANIONIC DETERGENT (SODIUM LAURYL SULPHATE)

Extract + heparin				Extract + sodium lauryl sulphate				Extract + sodium lauryl sulphate + protamine			
Inoculations in chickens	Developed tumours	Positive inoculations (per cent)	Mean weight developed tumours (gm.)	Inoculations in chickens	Developed tumours	Positive inoculations (per cent)	Mean weight developed tumours (gm.)	Inoculations in chickens	Developed tumours	Positive inoculations (per cent)	Mean weight developed tumours (gm.)
14	12	85	24	28	7	25	2	25	3	12	0.500

In the control chickens the ratio, developed tumours/inoculations was 70/76, with a positive inoculation of 92 per cent.