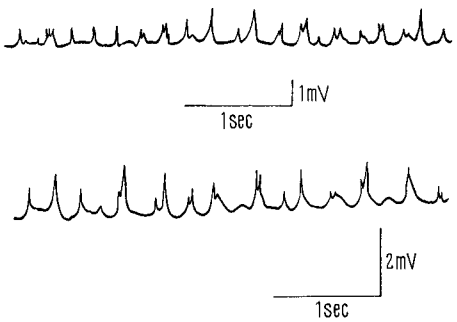
Effect of Tetrodotoxin on *Ascaris* Somatic Muscle

It has been shown in certain nerve and muscle tissues that tetrodotoxin selectively depresses sodium conductance rise during action potential spikes[1]. Certain preparations, notably the taenia coli of the guinea-pig, that show spontaneous spikes can, however, be treated with large concentrations of tetrodotoxin without showing measurable changes in spike height[2], a result favourable to the conclusion that in these preparations calcium conductance and not sodium conductance is involved in the spike. It was therefore decided to see whether tetrodotoxin had any effect on the potential spikes that can be recorded from the non-myofibrillar bellies of *Ascaris* somatic muscle cells.

Several *Ascaris* prevulval preparations[3] that were showing reliable spikes in a suitable saline were treated with tetrodotoxin up to a concentration of 5×10^{-3} g/l. In no case was the spike height or frequency significantly changed, and neither were they changed when the muscle was washed again with pure saline. In some experiments the toxin was left in contact with the preparation for 2 h. The effectiveness of the toxin was checked post-experimentally on frog sciatic nerve.

Negative results from experiments of this type must be interpreted with some caution as there are several membranes around the muscle cell belly visible electron microscopically[4] that could interfere with the passage of the toxin to the site of action. However, the insensitivity to tetrodotoxin would tend to confirm that in respect of the ionic mechanism of the spike the *Ascaris* somatic muscle cell is more akin to smooth muscle with calcium-conductance spike than to skeletal muscle with sodium-conductance spike. A sensitivity to Mn^{++} ions at 5 m*M* concentration and the high value of ^{22}Na loss from loaded muscles (up to 130 picomoles cm^{-2} sec^{-1}) in vivo[4] as well as the time-course of the spikes lend weight to this suggestion.



Typical records showing muscle cell potential spikes before (upper) and after (lower) of tetrodotoxin to the bathing saline. The concentration in this experiment was 5×10^{4} g/l, one tenth of that used in the most stringent experiment.

Résumé. La tetrodotoxine ne produit aucun effet sur les pointes de voltage qu'on enregistre dans les muscles somatiques de l'*Ascaris*. Ce fait s'accorde avec l'hypothèse que les ions autres que ceux du sodium sont les porteurs de charge pendant les pointes de voltage.

M. JARMAN and J. C. ELLORY

Department of Zoology, University, Bristol (England), 18 December 1968.

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Enhancing Effect of Insulin on Endotoxin Lethality

When bacterial endotoxins are injected into experimental animals an initial, transient hyperglycemia is produced, followed by a prompt fall in blood sugar to hypoglycemic levels. Although several mechanisms have been suggested to account for the toxicity of lipopolysaccharide endotoxins, the effect of these agents on carbohydrate metabolism has received scant attention. BERRY et al.[1] reported that the survival of experimental animals receiving a lethal dose of endotoxin and a therapeutic injection of cortisone appeared to be related to carbohydrate metabolism. SHANDS et al.[2] have suggested that in mice rendered hyperreactive to endotoxin by BCG injection, or zymosan, altered glucose metabolism may be involved in the observed toxic manifestations. In in vitro metabolic studies endotoxin has been shown to exert an insulin-like action on cellular glycolytic processes[3]. Since the induction of hypoglycemia can augment the susceptibility of animals to many inflammatory and hypersensitivity reactions, as well as to certain physical stresses[4-6], we felt that it would be of interest to determine the effect of insulin on the susceptibility of mice to bacterial endotoxin.

Six groups of 15 g female CFW mice, 8–10 mice per group, were used in this experiment. 3 groups were injected i.p. with 0.5 IU of Iletin insulin. 10 min later 1 of these groups was challenged i.p. with 200 µg of *Salmonella typhosa* 0901 endotoxin, another with 400 µg endotoxin, and the third group received no associated injection. The remaining 3 groups received endotoxin only (200, 400 and 800 µg). Deaths were tabulated at 18 h. From the results shown in the Table it is apparent

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