

**Les performances mécaniques du muscle strié
intoxiqué par le 1-fluoro-2-4-dinitrobenzene,**

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Translated from French

Mechanical performance of striated muscle intoxicated by 1-fluoro-2-4-dinitrobenzene,

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Sartorius muscles of frogs, normal or intoxicated with 1-fluoro-2-4-dinitro-benzene (.FDNB), are tetanized for two seconds six times at 2-minute intervals, at 0°C. The muscles are shortened during tetanus at a controlled velocity by a pneumatic ergometer, and the force P_r maintained at a given velocity is related to the isometric force P_m maintained just before the release. It is observed that the ratio P_r / P_m decreases with each successive tetanus, 0.01% for the normal muscles, and 0.04% for the muscles poisonous to the FDNB. The velocity of the shortening does not influence this decrease.

We deduce that the force-velocity relation changes during successive tetani. If it is defined by the hyperbola of HILL (1938), the observed changes imply that the isometric tension does not generally equal the P_o parameter of this equation. Expressed-in our normalized units, it then takes the form:

$$\left(\frac{P_r}{P_m} + \frac{a}{P_m} \right) (v + b) = b \left(\frac{P_o}{P_m} + \frac{a}{P_m} \right)$$

The rate constant b does not change, but the parameters a / P_m and P_o / P_m are linear functions of the number of tetani. The FDNB accentuates this dependence however, the force-speed relation of the first tetanus of the intoxicated muscle is similar to that of the first tetanus of the normal muscle.

If one defines the force-velocity relation by the exponential equation of AUBERT (1956), it is written:

$$\frac{P_r}{P_m} = e^{-v/B} - f$$

The repetition of the tetani does not change the rate constant B , but increases linearly the force f . FDNB increases the effect of repetition of tetani on the force constant f by about four times, without changing the rate constant B .

REFERENCES

- AUBERT, X. (1956). Energetic coupling of muscle contraction. Ed. Arscia, Brussels.
HILL, A.V. (1938). Proc. Roy. Soc., B, 126, 136-195.