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EFFECTS OF NITRIC OXIDE ON THE, CONTRACTION OF SKELETAL MUSCLE.

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Review of the literature (1) suggests to classify the effects of nitric oxide NO on skeletal muscles fibres in two groups. In a first group, the effects of NO are direct, due to nitrosation or metal nitrosylation of target proteins: depression of isometric force, shortening velocity of loaded or unloaded contractions, glycolysis and of mitochondrial respiration. The effect on calcium release channels varies, being inhibitory at low and stimulatory at high concentration of NO. The general consequence of the direct effects of NO is to "brake" the contraction and its associated metabolism. In the second group, the effects of NO are mediated by cGMP: increase of the shortening velocity of loaded or unloaded contractions, maximal mechanical power, initial rate of force development, frequency of tetanic fusion, glucose uptake, glycolysis and mitochondrial respiration; decreases of half relaxation time of tetanus and twitch, twitch time-to-peak, force maintained during unfused tetanus and of stimulus associated calcium release. There is negligible effect on maximal force of isometric twitch and tetanus. The general consequence of cGMP mediated effects of NO is to improve mechanical and metabolic muscle power, similar to a transformation of slow-twitch to fast-twitch muscle, an effect that we may summarize as a "slow-to-fast" shift.

1.-G. Maréchal & Ph. Gailly (1999). *Cellular and Molecular Life Sciences*, **55**, 1088-1102.