O2k brief Exercise
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High-Resolution FluoRespirometry and exercise

High intensity exercise inhibits carnitine palmitoyltransferase-I sensitivity to L-carnitine

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Exercise alters sensitivity to L-carnitine in an intensity-dependent manner in mouse skeletal muscle fibres of SDH increases ROS production in both

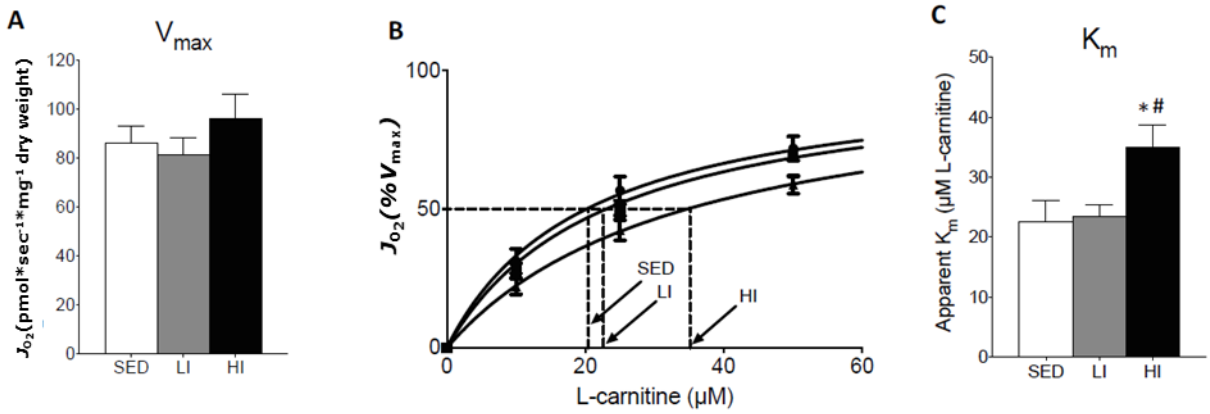

Figure 1. L-carnitine sensitivity is regulated in an intensity-dependent manner. In the absence of changes in L-carnitine Vmax (A), high-intensity (HI) exercise attenuated L-carnitine sensitivity (B and C) compared to low-intensity exercise (LI) and no exercise (sedentary, SED).

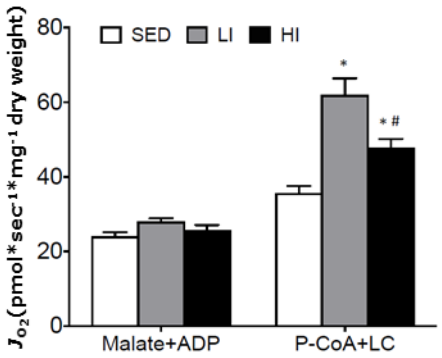

Figure 2. Lipid-supported respiration in the presence of physiological substrate concentrations associated with each metabolic state. While lipid-supported respiration was greater following both LI (60µM P-CoA+175µM LC) and HI (60µM P-CoA+100µM LC) compared to SED (10µM P-CoA+250µM LC), the response to HI was 30% lower than LI. LC, L-carnitine; P-CoA, palmitoyl-CoA.

Changes in available L-carnitine and in sensitivity to L-carnitine during intense exercise may in part account for a reduction of fatty acid oxidation. Together with other exercise-related alterations this can make carnitine palmitoyltransferase-I (CPT-I) an important control point for fuel-selection during enhanced ATP-demand

Reference: Petrick HL, Holloway GP (2019) High intensity exercise inhibits carnitine palmitoyltransferase-I sensitivity to L-carnitine. Biochem J 476:547-58.

Text slightly modified based on the recommendations of the COST Action MitoEAGLE CA15203. Doi:10.26124/mitofit:190001.v4