



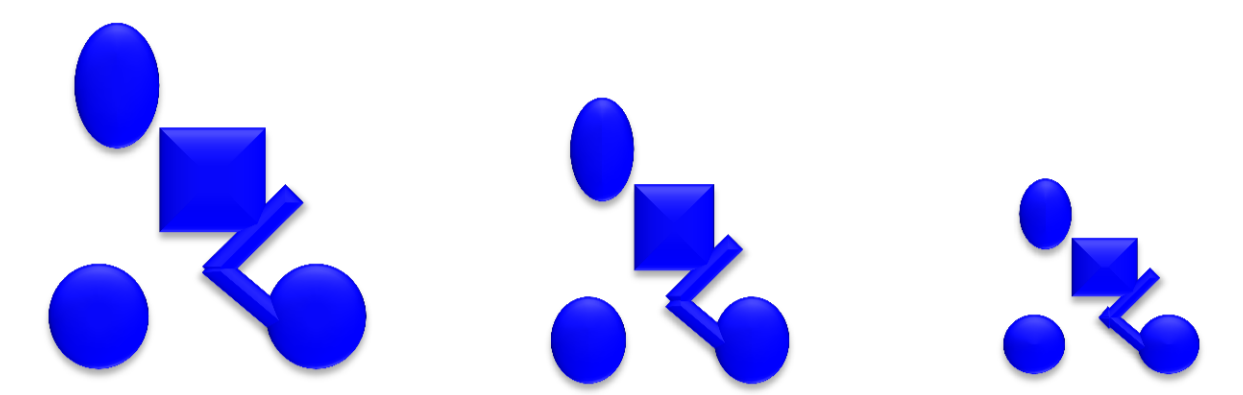
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Different Effects of Interval and Continuous Exercise Regimens on Capacity of Mitochondria Oxidative Phosphorylation in Lymphocyte



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Abstract No.2352 Background and Purpose:

Mitochondrial biogenesis is a critical metabolic adaptation to aerobic exercise training. What kind of the exercise strategy that enhances mitochondria oxidative phosphorylation in lymphocyte and subsequently improves immune function has not yet been established. This study elucidates how interval and continuous exercise regimens affect capacity of mitochondria oxidative phosphorylation in lymphocytes.

Method:

Twenty-four sedentary males were randomized to perform either aerobic interval training (AIT; 3-minute intervals at 40% and 80%VO_{2max}, n=12) or moderate continuous training (MCT; sustained 60%VO_{2max}, n=12) for 30 minutes/day, 5 days/week for 6 weeks. According to a novelistically designed Substrate-Uncoupler-Inhibitor Titrations (SUIT) protocol, various modes of mitochondrial respiratory control were analyzed by a high resolution respirometer (Oxygraph-2k).

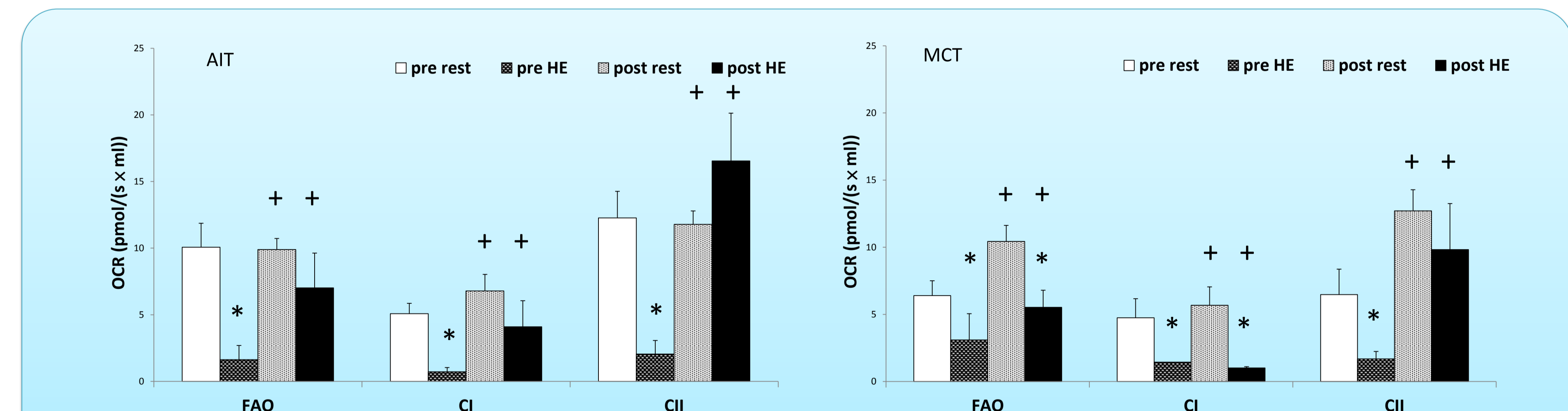
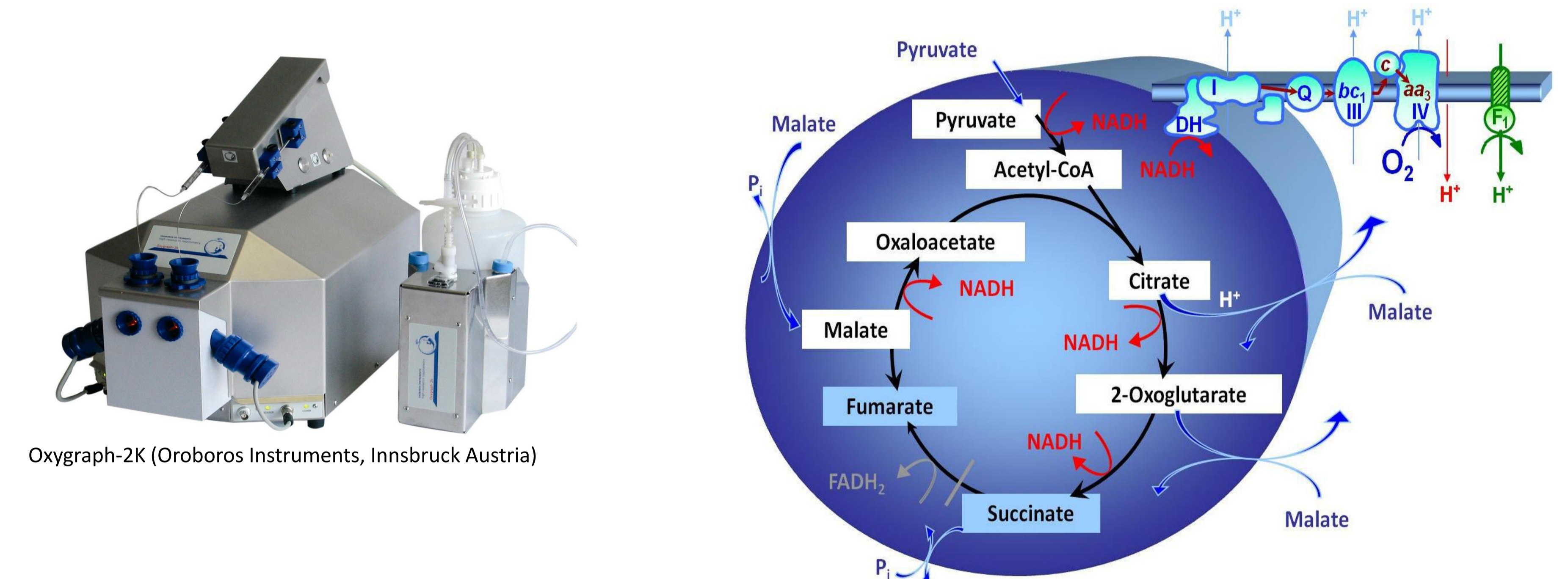
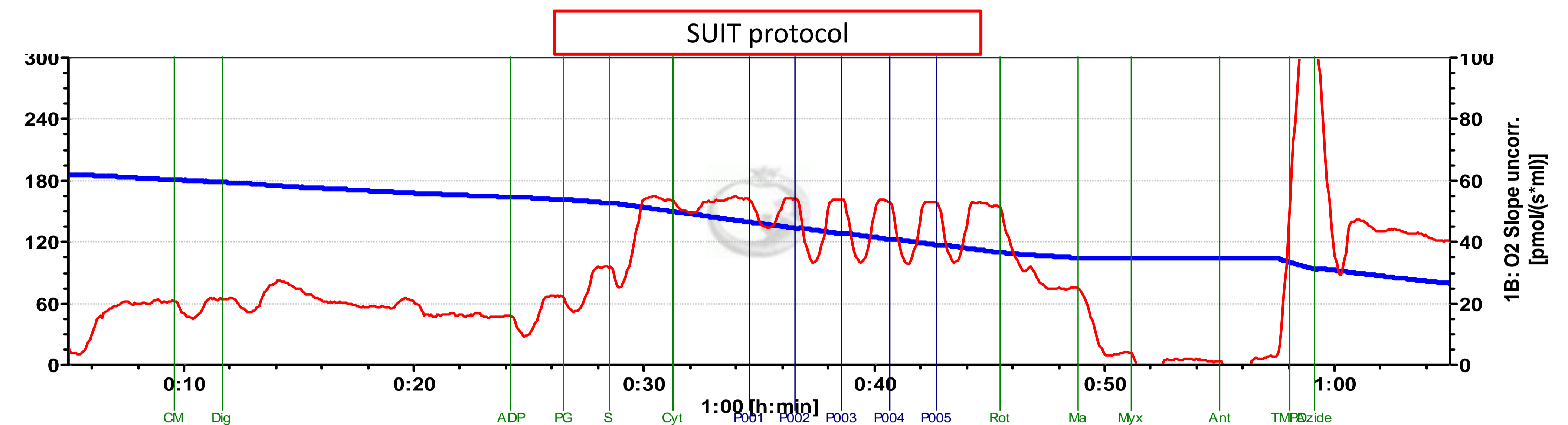
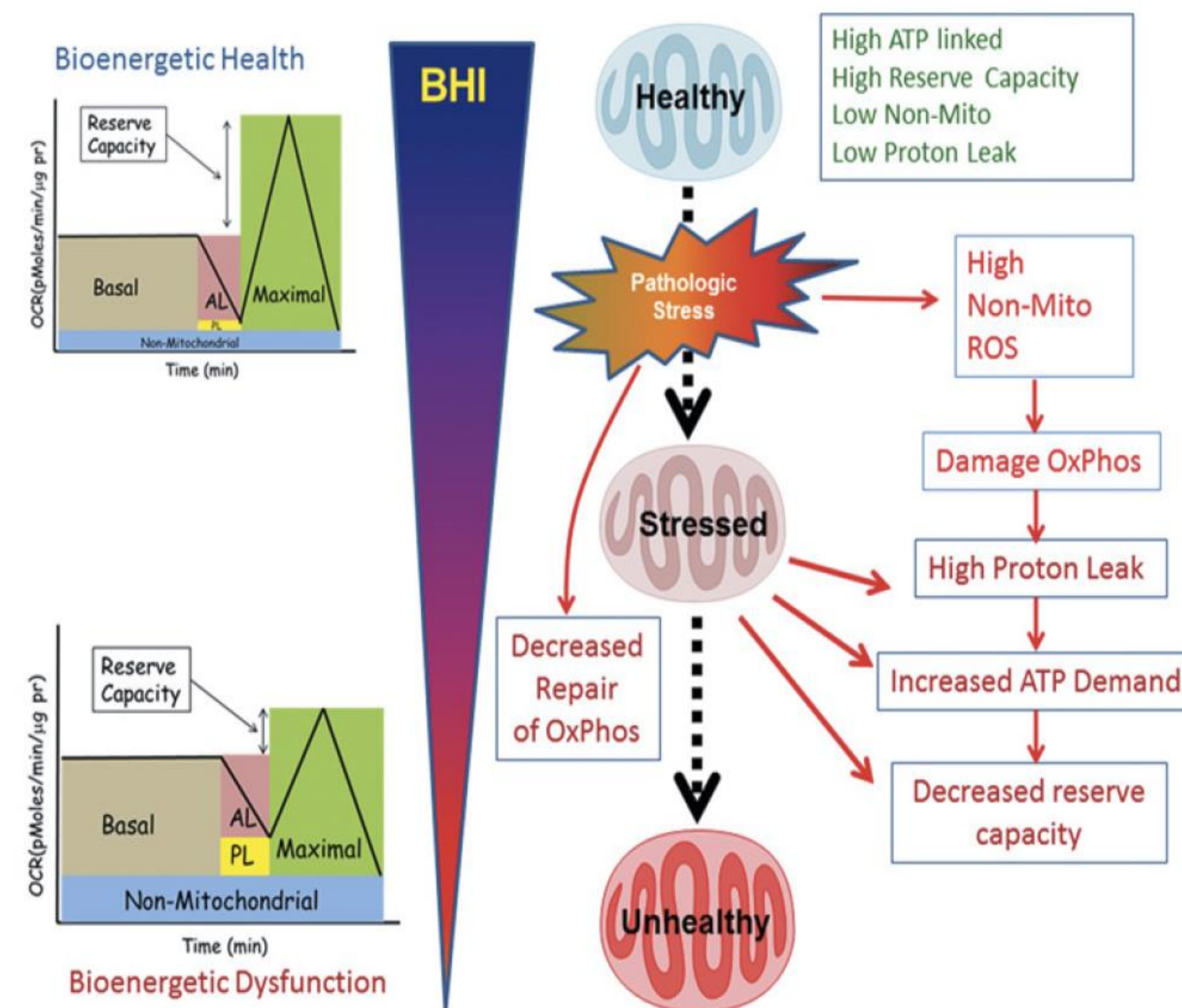
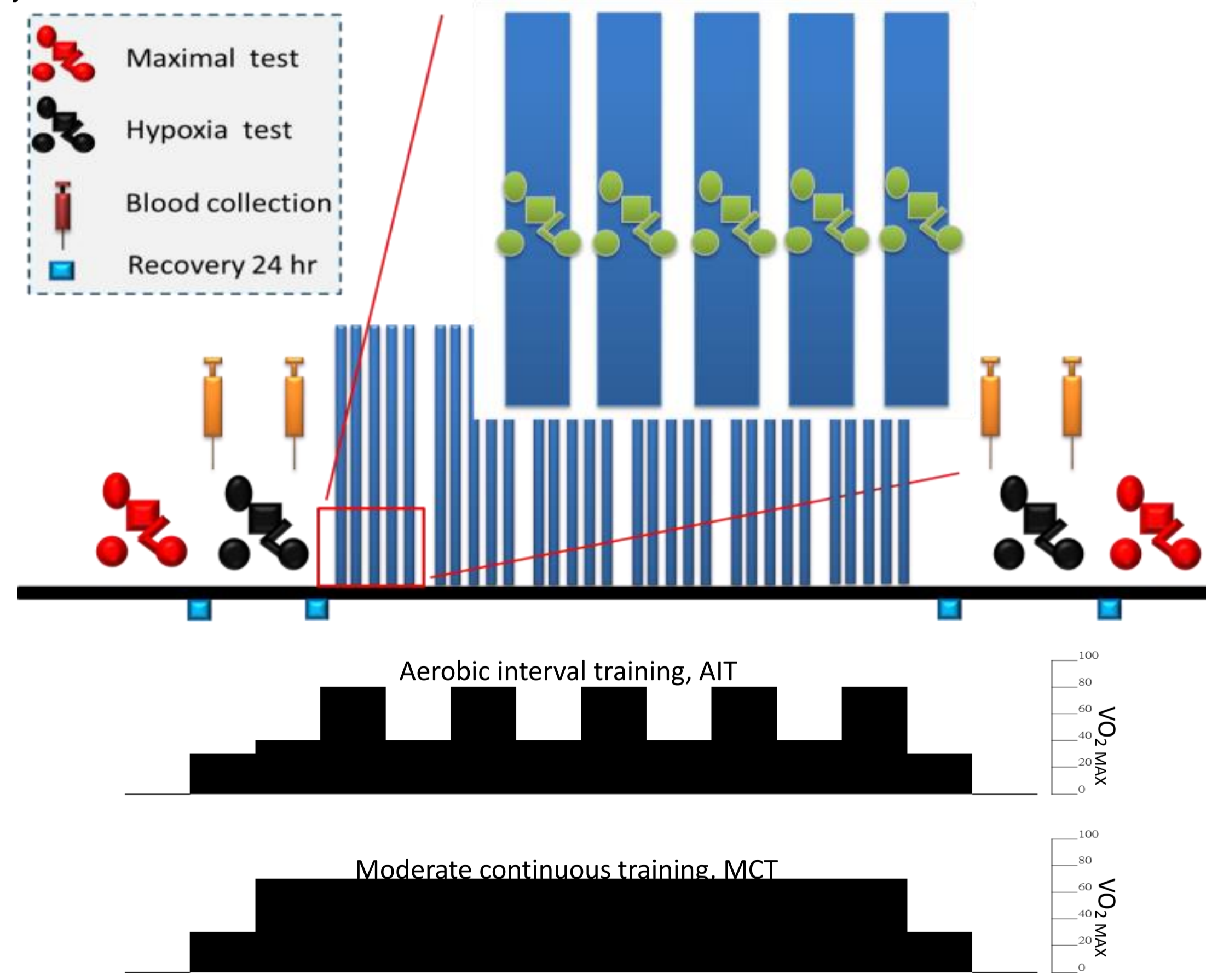


Fig. 2 AIT modestly enhanced pyruvate plus glutamate-mediated OCR, whereas MCT elicited predominant succinate- and palmitoyl carnitine-mediated OCR in permeabilized lymphocytes. Both AIT and MCT reduce the decline of complex II OCR level after hypoxia exercise, when AIT has greater effect than MCT. *P<0.05, Rest vs. HE; +P<0.05, Pre vs. Post

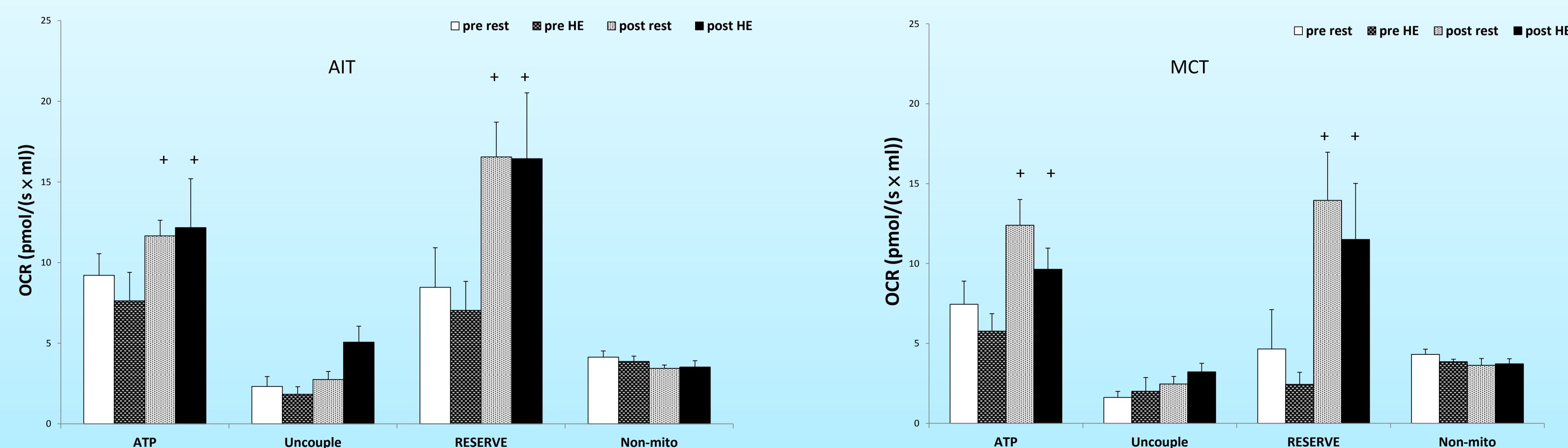


Fig. 1 Both AIT and MCT regimens significantly increased ATP-linked O₂ consumption rate (OCR), elevated reserve capacity of OCR, while uncouple and non-mitochondrial OCR in intact lymphocytes. *P<0.05, Rest vs. HE; +P<0.05, Pre vs. Post

Training effect on resting lymphocyte mitochondria

	AIT	MCT
ATP-linked OCR	↑	↑
Reserved capacity	↑	↑
FAO	↔	↑↑
CI	↑	↔
CII	↔	↑↑

Training effect on HE

	AIT		MCT	
	pre	post	pre	post
ATP-linked OCR	↓	↔	↓	↓
Reserved capacity	↓	↔	↓	↓
FAO	↓↓	↓	↓↓	↓↓
CI	↓↓	↓	↓↓	↓↓
CII	↓↓	↔	↓↓	↔