Exercise prescription and mitochondrial content and function

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While there is agreement that exercise is a powerful stimulus to increase both mitochondrial function and content, we do not know the optimal training stimulus to maximise improvements in mitochondrial biogenesis. This presentation will focus predominantly on the effects of exercise on mitochondrial function and content, as there is a greater volume of published research on these adaptations and stronger conclusions can be made. The results of cross-sectional studies, as well as training studies involving rats and humans, suggest that training intensity may be an important determinant of improvements in mitochondrial function (as determined by mitochondrial respiration), but not mitochondrial content (as assessed by citrate synthase activity) (Bishop, Granata, & Eynon, 2014; Granata *et al.*, 2016a). In contrast, it appears that training volume, rather than training intensity, may be an important determinant of exercise-induced improvements in mitochondrial content (Granata *et al.*, 2016b). Our recent results also indicate that the early molecular events in response to a single bout of exercise differ between high-intensity and high-volume exercise, and this may help to explain the different training responses (Granata *et al.*, 2017).

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