NUTRITIONAL SUPLEMENTATION AND EXERCISE TO OPTIMIZE EXERCISE PERFORMANCE: FOCUS ON INDIVIDUAL RESPONSES AND A STEP TOWARDS PERSONALIZED SPORTS NUTRITION

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ABOUT THE PROJECT

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Ergogenic aids are nutritional supplements predominantly directed towards enhancing exercise capacity and performance, although they may else provide health related benefits. Sodium bicarbonate, caffeine and β-alanine have become essential training additions for elite, professional and recreational athletes alike and their efficacy in improving exercise capacity and performance is supported by substantial research. Nonetheless, variability in responses has led to recent suggestion that supplementation may not be beneficial to all individuals. It is of interest to determine the sources of inter- and intra-individual variations and whether resulting information can be used to optimize dosing strategies for exercise performance. Study 1 will evaluate the consistency in responses to sodium bicarbonate supplementation, revealing whether we can viably individualise the timing of ingestion according to the individual. In study 2 we will determine whether enteric capsules can optimize the dose response to sodium bicarbonate supplementation, and alleviate some of the associated side-effects. Study 3 will elucidate the consistency in exercise responses to supplementation with sodium bicarbonate, while study 4 will determine whether changes in muscle transporter activity are related to the changes in circulating bicarbonate. Study 5 will determine the time course blood responses following caffeine ingestion between individuals with different phenotypes for caffeine metabolism, while study 6 will determine the role of phenotype upon the efficacy of caffeine for exercise. Study 7 will determine the acute metabolic responses to β-alanine supplementation pre and post 4 weeks of supplementation, while study 8 will determine whether an acute bout of training also influences these same metabolic responses. We believe that the results obtained in this comprehensive project will have significant and long-lasting impacts on the understanding of acute metabolic responses to supplementation and exercise, and will play a fundamental part in the optimization of supplementation for athletic populations, as well as directing future work in the area.