

PROJECT REVIEW

"Physiological and biological longitudinal follow-up of elite and amateur athletes: a study of confounding factors for the ABP"

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The goal of our first study is to investigate the correlation between the Athlete Biological Passport (ABP) variables and performance data from competitive elite athletes analyzed from training and racing power outputs (elite cyclists), apneic time, depth or distance (trained apneic divers) and endurance capacity (sport students). In this way, our study would challenge the complexity of confounding factors affecting the interpretation of the ABP. Testing the hypothesis that variations in performances are related to variations in the ABP in different sport disciplines would allow the ABP model to be strengthened. Finally, our project will evaluate the range of variability of identified confounding factors altering the blood formula in a population of trained apnea divers. It is hypothesized that breath-holding methods and specific apnea training techniques may significantly alter blood parameters from the ABP. Indeed, it has already been shown that 3 repeated breath-holdings increase hemoglobin concentration ([Hb]) in divers, skiers and untrained humans acutely while an extension of such findings in the context of the ABP is still needed. Overall, our study aims at improving the ABP by challenging the individual within-subject variance in light of known confounding factors. The objectives of this study are threefold: firstly, this study will allow to further investigate the relationship between Hbmass and aerobic performances in three distinct populations (elite cyclists, apnea divers, sport students). Second, blood variables data collected monthly will allow us to discriminate between the influence of specific confounding factors thanks to the multi-sourcing data and heterogeneous groups (cyclists, apnea divers, sport students). Overall, this study will enable us to strengthen the ABP after looking at the within-subject variations to propose a robust evaluation of known underlying confounding factors.

Second, we will conduct a study investigating the influence of the menstrual cycle on hematological variables to identify potential variations factors specific to blood losses and hormonal variations.

Thirdly, we will conduct a study on elite race walkers to describe hematological variations observed before, during and after a prolonged exposure to i) altitude and ii) heat in their final preparation block before a major competition.