

Reasoning of dissertation topic and competency of potential supervisor for admission into LSU biology doctoral studies with a participation of Tartu university 2023

Area of research (title and code)	
Field of research (title and code)	Biology
Topic of research	Sport Coaching and Performance
Institution	Lithuanian Sports University / University of Rome “Foro Italico”

Potential supervisor

Pedagogical and scientific degree	Name, surname	Academic position
PhD	Daniele Conte	Visiting Professor and Researcher

Short reasoning of proposed dissertation topic

Title
Monitoring training load, recovery and sleep measures to optimize the training prescription in elite and recreational runners
Short research description (including aims and objectives) (maximum 1500 characters).
<p>This PhD project will focus on the analysis of the relationship between various internal (i.e. heart rate) and external (i.e. running distance and velocity) load, recovery (i.e. heart rate variability, nocturnal resting heart rate and wellness scales) and sleeping (total time etc.) measures with the running performance of recreational and elite endurance runners. Overall, the project will assess the sensitivity of these measures in monitoring the training load and specifically how the external load measures influence the internal load, recovery and sleeping measures. Moreover, a model will be created to define the best predictors of running performance during official competitions at both elite and recreational level.</p>
Relevance of the problem, its novelty at national and international level (maximum 1500 characters).
<p>Monitoring load and recovery measures is an established evidence-based methodology used across several individual and team sports to help coaches for the prescription of training load. Endurance running is one of the most popular sports worldwide with many participants at elite and recreational level. There is an overabundance of anecdotal methods without robust scientific support to monitor training loads and design the training plans such as the “10% rule” for weekly training load increments. Previous literature focused on the use of various monitoring tools such as external (distance, running velocity) and internal (heart rate based measures) load measures, heart rate variability etc (Boullousa et al., 2020). However, the superiority of these measures to inform for the prescription of the training dose has not been established yet. Indeed, it is not clear if one measure can better inform regarding the training process due to a high relationship with the final performance or its sensitivity in detecting a fatigue status (i.e. alteration following training sessions) or if it would be better a combination of measurements to prescribe an adequate stimulus. Sleeping patterns also play an important role in monitoring the health and recovery status of the athletes, however, surprisingly, little and contrasting information is available for endurance runners (Tomas et al., 2020). Therefore, the aim of this project is to understand the load, recovery and sleep measures better associated with the endurance running performance and potentially creating a model to predict the performance profile of endurance athletes at elite and recreational level.</p>

Boullosa, D., Esteve-Lanao, J., Casado, A., Peyré-Tartaruga, L. A., Gomes da Rosa, R., & Del Coso, J. (2020). Factors affecting training and physical performance in recreational endurance runners. *Sports*, 8(3), 35.

Thomas, C., Jones, H., Whitworth-Turner, C., & Louis, J. (2020). High-intensity exercise in the evening does not disrupt sleep in endurance runners. *European journal of applied physiology*, 120, 359-368.

Research methods and possibilities for conducting these studies (maximum 1500 characters).

Participants will be elite and recreational runners recruited in various running clubs within Lithuania. All the necessary monitoring tools will be available at the running clubs or the Lithuanian Sports University laboratories, limiting the extra costs for purchasing new equipment. Overall, all measures will be monitored with valid and reliable activity trackers such as GPS watches for external load, heart rate belts for internal load, apps such as elite HRV for heart rate variability, and actigraphies for sleeping patterns. The association and sensitivity of the studied measures will be assessed with individual relationship via linear mixed models, while the potential prediction models for endurance running performance will be assessed with the support of a data analyst expert in big data analyses.

Is the proposed topic for the doctoral thesis related to currently funded research projects? Please indicate the links between the proposed topic for the doctoral thesis and funded research projects

The project is not part of a funded research project.

Is the proposed topic for the doctoral thesis related to joint research with a foreign institution? Please indicate the links between the proposed topic for the doctoral thesis and research with a foreign institution

The PhD project will be developed in collaboration with the University of Rome "Foro Italico". Prof. Laura Capranica will be co-supervising the project and her support will be important since her experience in supervising PhD students and specifically on the topic of monitoring load and recovery measures in various team and individual sports. Moreover, this relationship will strengthen the already existing collaboration between the two institutions, which are now creating a new application for a joint University Alliance project at European level to be submitted in the following next 6 months.

Currently, I am supervisor of 3 doctoral students.

Supervisor



(signature)

Daniele Conte

(Name, surname)

Date 02.05.2023