PhD scholarship, University Jean Monnet, Saint-Etienne, France

Performance, fatigue and recovery: a road vs trail running comparison

A 3-year fully funded PhD scholarship may be available at the University Jean Monnet in Saint-Etienne (France) under the supervision of **Guillaume MILLET** (Prof of Exercise Physiology), **Jérémy ROSSI** (Assistant-Professor in Biomechanics) and **Richard BLAGROVE** (Lecturer in Physiology at Loughborough University).

Applicants should have (or anticipate having) a MSc and strong research background in exercise physiology and/or biomechanics and/or neurophysiology. Without necessarily being a regular runner, the candidate must demonstrate an interest in this sport.

The successful applicant will become part of a unique training and research environment, the multidisciplinary Inter-university Laboratory of Human Movement (LIBM) at the **University of Saint-Etienne** in **collaboration with** the renowned School of Sport, Exercise and Health Science at **Loughborough University**.

As PhD student, you will be responsible for:

- Independently carrying out research and completing a PhD dissertation within three years;
- Collecting and analyzing physiological and biomechanical data, including VO_2 and neuromuscular function data (EMG, electrical stimulation), accelerometry, actigraphy, both in the lab and in the field.
- Follow a large cohort of several hundreds of road and trail running
- Reporting the results in international peer-reviewed scientific journals and conferences.

There are **no citizenship restrictions**. Speaking French is not mandatory. However, the candidate must be willing to learn French.

Applications should include a cover letter discussing your interest in the position and stating the date when you expect to be available, CV, and the names and contact information of two academic references.

Application deadline: will remain open until filled.

Tentative start date: September or October 1st, 2022.

PROJECT SUMMARY

While the marathon has always been the reference event, trail running is getting more and more popular. Some studies, in particular at the LIBM, have investigated performance and fatigue in trail running, but little is known about chronic fatigue and the risks of injury in this discipline. Moreover, a direct comparison of the two disciplines (marathon vs trail running), either on fatigue or performance factors, has never been done to our knowledge.

This PhD project aims to (i) study the etiology of fatigue and recovery (acute and chronic) in road vs trail running and (ii) investigate the differences in training, physiological and biomechanical characteristics between the two disciplines and the consequences on injuries in road and trail runners. The main hypothesis is the following: despite the increased eccentric work in trail running due to the descent, the induced fatigue is higher and the recovery longer after a marathon than after a trail run of the same duration. It is also hypothesized that differences in running economy will exist between trail runners and road runners when running on technically difficult terrain.

Three studies will be conducted:

o the 1st one will follow a **cohort** of several hundred trail and road runners for an entire season on subjective fatigue, training load and characteristics, number and type of injuries, and field test results. Using an **application** developed at LIBM, this will allow to better understand the relationship between training load, fitness/performance, fatigue and injury rate. A subgroup of subjects (approximately 30) will visit the laboratory every 2 months for a more objective evaluation of their aerobic and neuromuscular performance.

o The 2nd study will consist of a large **field experiment** where we will (i) compare neuromuscular **fatigue** induced by a marathon vs. a trail race of similar duration and (ii) follow **recovery** over 4 weeks after the race. Recovery will be studied through regular measurement of neuromuscular function, sleep, and heart rate variability.

o The 3rd study will focus on the comparison of **running economy** and biomechanical patterns between trail runners and road runners when running on terrain of varying technical difficulty.

CONTACT

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