

Internship offer
M2 Musculo-Skeletal system, Locomotion, Exercise (MuSkLE)

Title of the Internship: *BFstretch* project: “Assessment of mechanical behaviour in the two heads of the *biceps femoris* muscle during passive knee motion at different hip angles”

Laboratory (name, n°, website): *Laboratoire Interuniversitaire de Biologie de la Motricité*, UR 7424.

Research team (name, website): “Sport Performance and Injury Prevention” (SPIP, [website](#)).

Supervisor to contact (name, email address): Alexandre Fouré, alexandre.foure@univ-lyon1.fr

Project description including a short introduction, aim/objectives and methods/approach to be used

Athletes are commonly exposed to the risk of hamstring injuries, particularly the *biceps femoris* which accounts for 85% of injuries in this muscle group (Edouard *et al.* 2020). The involvement of potential intramuscular constraints is increasingly being assumed (Fouré & Gondin, 2021). Moreover, from an epidemiological perspective, females are less affected by these injuries than males (Edouard *et al.* 2015).

The main objective is to evaluate the passive mechanical behaviour of the *biceps femoris* during knee motion at different hip angles and the potential interaction between the two heads (short head: mono-articular - knee flexor | long head: bi-articular - knee flexor and hip extensor). A measurement of the shear modulus using ultrasound elastography (Fouré *et al.* 2022) during passive knee stretches at different hip angles will allow us to assess the potential reciprocal functional influence between these two heads within the same muscle. The behaviour of the other hamstring muscles (*i.e.*, *semitendinosus*, *semimembranosus*) (sub-objective#1), the intramuscular variability (sub-objective#2) and the sex-related difference (sub-objective#3) will also be examined.

References:

Edouard *et al.* 2020 Br J Sports Med 54(3): 159-167.
Fouré & Gondin 2021 Exerc Sport Sci Rev 49(1): 59-65.
Edouard *et al.* 2015 Br J Sports Med 49(7): 472-477.
Fouré *et al.* 2022 Scand J Med Sci Sports 32(10): 1477-1492.

Skills required:

Academic and technical knowledge of muscle tissue biomechanics, human anatomy and exercise-induced muscle injuries is a requirement. Strong written and verbal communication abilities, curiosity, initiative, creativity, attention to detail in conducting assessments, teamwork, and appropriate social interactions are essential. Computer skills, such as programming abilities, are a plus.