**PhD SCHOLARSHIP: Neuromuscular electrical stimulation and local vibration: effects of reflexive activation of motor units on neuromuscular adaptations**

A fully funded 3-yr PhD scholarship is available at Jean Monnet University in Saint-Etienne (University of Lyon) in collaboration with the Schulthess Clinic in Zurich. The successful applicant will become part of a unique training and research environment, the ActiFS group within the multidisciplinary Inter-university Laboratory of Human Movement (LIBM). As PhD student, you will be responsible for:

* Independently carrying out research and completing a PhD dissertation within three years;
* Collecting and analyzing neuromuscular function data (EMG, electrical stimulation, transcranial magnetic stimulation);
* Reporting the results in international peer-reviewed scientific journals and conferences.

Net remuneration around 1420€ monthly (healthcare included) from October 2019 to September 2022.

**LaboratoRIES**

* Inter-university Laboratory of Human Movement Biology, Jean Monnet University, Saint Etienne, France
* Human Performance Lab, Schulthess Clinic, Zurich, Switzerland

**SUPERVISOR**

Thomas LAPOLE, LIBM, Saint Etienne

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**Co-SUPERVISOR**

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**PROJECT SUMMARY**

Neuromuscular electrical stimulation (NMES) is commonly used to evoke muscle contractions in the absence of voluntary neural drive, i.e. through the recruitment of alpha motor neurons. This rehabilitation modality has the potential to preserve or restore skeletal muscle function during or after a period of immobilization, thus reducing the secondary complications of disuse. The clinical use of NMES is however limited by patient’s tolerance to the painful stimuli and/or by early and marked fatigability due to random motor unit recruitment. To overcome this latter limitation, the use of wide-pulse high-frequency NMES has recently been proposed. Compared to conventional NMES, this stimulation modality may favour motor unit recruitment through reflexive pathways involving sensory afferents originating from muscle spindles. Interestingly, the same afferents may also be similarly involved with local vibration, a more physiological way to recruit motor units. Thus, the aim of this PhD project is to investigate acute changes in neuromuscular function induced by different forms of NMES (conventional vs. wide-pulse NMES) with and without concomitant vibration of the stimulated muscles. Two lower limbs muscle groups that have an important functional role will be tested (knee extensors and plantar flexors). The obtained results should help defining basic recommendations for the clinical use of both vibration and NMES therapy, with particular emphasis on their potential combination.

**Applicant profile**

The candidate should have a strong background in neuromuscular function analysis. Knowledge of transcranial magnetic stimulation is an asset. Experience with NMES and/or vibration will be appreciated. Since a clinical transfer is expected, experience in the health domain will be considered. French is not mandatory but the candidate must be willing to learn French during her/his PhD and she/he must be able to communicate in English.

**Full application must be sent in pdf format (gathered in one file) to the PhD supervisor and Cc to the co-supervisor. Deadline is April 29th, 2019. The application must include the application form (see attached document), a detailed CV, one academic reference letter and a motivation letter. Interviews will be conducted by videoconference on May 14th.**

**APPLICATION**

**PhD SCHOLARSHIP**

**Year 2019**

**It is important not to exceed the number of pages allocated to each item.   
  
Additional documents must be attached to the scanned file   
(they are indicated in the remainder of the file).   
  
This file must be sent by E-mail to the Thesis Supervisor with Cc to the Co-supervisor.**

**Last name, First name:**

**Citizenship:**

**E-mail:**

**Thesis title:** Neuromuscular electrical stimulation and local vibration: effects of reflexive activation of motor units on neuromuscular adaptations

**Name of supervisor:** Thomas Lapole

**Thesis’ primary host laboratory:** Inter-university Laboratory of Human Movement Biology, Jean Monnet University, Saint Etienne, France

**Date of taking contact with supervisor:**

**Date of interview with supervisor:**

**CURRICULUM VITAE**

*(2 sided pages maximum)*

**Contact information**

Last name:

First name:

Nationality:

Date and place of birth:

Age:

Mailing address:

Phone:

**BSc degree or equivalent**

Institution (University, School):

Country:

Year of graduation:

Mention / Specialty:

Rank / Class size:

**MSc degree 1st year**

Institution (University, School):

Country:

Master (mention, specialty):

Academic year:

Rank:

Corresponding to: 🞏 First 10% 🞏 10-20% 🞏 20-50% 🞏 > 50%

Size of class (number of students)

**Transcript must be attached**

**MSc degree 2nd year**

Institution (University, School):

Country:

Master (mention, specialty):

**1er semester:**

Academic year:

Rank:

Corresponding to: 🞏 First 10% 🞏 10-20% 🞏 20-50% 🞏 > 50%

Size of class (number of students):

**Transcript must be attached**

**2nd semester if known:**

Academic year:

Rank:

Position: (*check good indication*)

🞏 TB or < 10% 🞏 B or 10-20% 🞏 AB or 20-50% 🞏 > 50%

Size of promotion:

**Transcript must be attached**

**MSc work experience or equivalent**

Supervisor:

Laboratory:

University:

Country:

Dates (month / year) of experience:

Title:

Publications, participation in conferences:

**Indicate maximum 5 keywords that characterize your scientific skills**

***Attach two (2) academic reference letters with your application***