UNIVERSITÉ DE NANTES

Laboratoire
Motricité - Interactions - Performance
EA 4334 Nantes - Le Mans

POSITION DESCRIPTION

Position title: Post-doctoral fellow

Organisation unit: Faculty of Sport Sciences
Laboratory "Movement, Interactions, Performance"

Type of employment: Full time, fixed term for 3 Years*
** contract to be renewed after the 1st year*

Net salary: 2,200 €/month

University of Nantes

Nantes is the 6th biggest city in France with almost 300,000 inhabitants, and is the main city in the west of the country. It has several features, which make it an attractive destination (history, culture, economy, employment, etc.)
The University of Nantes student community (45,200) includes 33,534 students in initial education (Bachelor, Masters or Doctorate), 3,360 foreign students and 11,500 people enrolled in continuing education. The university has 1560 teaching/research staff.
For more information, please visit our website (an English version is available):
http://www.univ-nantes.fr/

Faculty of Sport Sciences – Laboratory "Movement, Interactions, Performance"

The faculty of sport sciences welcomes around 1500 students who are aiming for careers within sport, from teaching physical education, sports training, sports management, to research into sports science (within the 3 affiliated laboratories). The faculty of sport sciences is located at the edge of the university's Tertre campus, nearby all facilities, which are essential to students (such as the university library, university restaurant, university clinic, student union, university sports service and several sports facilities).
The "Movement, Interactions, Performance" research team (MIP, recognized as Equipe d'Accueil by the French Ministry of Higher Education and Research) gathers 5 Professors, 11 Associate professors and 17 PhD students from the University of Nantes (Faculty of Sport Sciences) and the University of Maine (Department of Sport Sciences), working together in a multidisciplinary scientific

program, entitled "Performance analysis and optimization". The domain of interest is the characterization and the understanding of physiological, biomechanical and psychological processes involved in human performance. A better understanding of adaptive plasticity and of the conditions in which it can be exploited in various sports, educational and therapeutic situations, represents a priority.
For more information, please visit our website:
http://www.mip.univ-nantes.fr/

Duty Statement

Primary purpose of the position: This post-doctoral position aims to support a project (QUETE) funded by the *Region Pays de la Loire* (PI: Prof François Hug).

Our research team pioneered the use of shear wave elastography (mainly supersonic shear imaging [SSI]) to assess localized stiffness of tissues of the neuromuscular system (i.e. muscle, tendon, nerve). More precisely, our recent works were the first to demonstrate that *muscle stiffness is linearly related to both active and passive muscle force*, therefore providing the sole non-invasive experimental method to estimate change in individual muscle force (Hug et al., Exerc Sports Sci Rev, 2015). This innovative multidisciplinary approach to estimate individual muscle force, and more generally, the quantification of stiffness of a localized area of tissue, provide considerable opportunities for new insights into changes in muscle mechanical properties with musculoskeletal and neurological disease progression and rehabilitation.

The approach proposed by our team is growing worldwide, and the aim of this grant is to develop and consolidate collaborations with international experts in biomechanics and physiotherapy. The international consortium build in this project should allow us to further develop our leadership on this theme. It is anticipated that the knowledge gained from this project will contribute to: 1) refine our method to estimate individual muscle force, 2) improve risk identification/diagnosis of major neurological (e.g. cerebral palsy, stroke, neuropathies) and musculoskeletal (e.g. anterior knee pain) diseases, and 3) lay the foundation for the development of innovative preventive/rehabilitation strategies.

We will lead a local network composed by researchers from the University of Nantes, Nantes university hospital (Physical medicine and Rehabilitation, Rare diseases), Le Mans University and the School of Physiotherapy of Nantes. This project will allow us to consolidate ongoing international collaborations with experts in musculoskeletal and neurological disorders (The University of Queensland, Australia, The Auckland University of Technology, New Zealand; University of Lisbon, Portugal). In addition, we will develop new collaborations with experts in biomechanics, musculoskeletal modelling (New York chiropractic college/Cornell University, USA) and physiotherapy (Hong Kong Polytechnic University).

Duties

Duties and responsibilities include, but are not limited to:

Teaching and learning (15%)

- Contribute to supervision of research higher degree candidates (e.g. MsC students and PhD students)

Research (70%)

- Coordinate projects related to measurement of elasticity of soft tissues (nerve, tendon and muscle)
- Conduct research and publish scientific articles
- Data collection (electromyography, elastography, etc.)
- Data analysis, including contribution to design of analysis protocols, extraction of variables and statistical analysis
- Work with colleagues and postgraduates in the development of joint research projects

Administration (15%)

- Perform a range of administrative functions related to conduct of the soft tissue stiffness research stream in the laboratory
- Organize a skype meeting with the other members of the international network every 6 months / write-up notes

Selection criteria

Essential

- PhD in an area related to biomechanics, human movement sciences or physiotherapy
- Demonstrated expert knowledge in muscle biomechanics
- Demonstrated experience with elastography and/or ultrasonography
- Demonstrated experience with conductive of research with human participants
- Experience with recruitment of research participants
- Ability to work independently and collaboratively with colleagues
- High level formal written and oral communication skills
- Proficiency with English

Desirable

- Experience with Matlab or other computer programming
- Experience with conduction of research with people with musculoskletal and/or neurological conditions

Contact:

Prof François Hug (francois.hug@univ-nantes.fr)

CV and selection criteria responses should be sent to Prof François Hug by 16th October 2015.