University of Stuttgart
Germany

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**PhD position (75%, 3 years) at the Institute of Sport and Movement Science (University of Stuttgart)**

A PhD position is available at the Department of Motion and Exercise Science at the University of Stuttgart, Germany. The PhD position is associated with a DFG (Deutsche Forschungsgemeinschaft) founded research project entitled **"Validation of recent theories of skeletal muscle contraction: experiments and modelling"**. The position (TV-L E13; 75%) is for three years with a start date in December 2019.

Despite numerous studies on skeletal muscles and diverse applications of muscle models in biology, medicine, biomechanics and physiology, there are still fundamental questions about the muscle's physiology and force generation. Most of the muscle models used are based exclusively on both the classical sliding filament- and the cross-bridge theory of muscle contraction. These models ignore the dependence of muscle force on the history of contraction (over- or underestimation of forces during and after active muscle shortening or lengthening, respectively). In addition, kinetic and microstructural findings at short sarcomere lengths contradict the classical theories of muscle contraction. Both lead to a confusion regarding the relationship between structure and function of the muscle.

In this subproject, fundamental mechanisms of force generation are analyzed on the level of isolated single muscle fibres/myofibrils. For this purpose, muscle fibres/myofibrils will be prepared and experiments will be carried out under different boundary conditions using a validated setup. In a close interaction with these experiments, a structurally motivated muscle fibre model will be developed in another subproject. Though a detailed working plan exists, there is room for developing own hypotheses. The research project contributes to a quantitative understanding of the mechanisms involved in force development. This promotes the basic understanding of human locomotion and can be used e.g. for developing efficient humanoid drives with application in the field of movement science, medical engineering, robotics and prosthetics.

**Required Qualifications:**
- applicants should be highly motivated and should have an excellent MSc in biomechanics/sport science, kinesiology, biology/physiology, neurophysiology, (bio-)physics or a related field
- high interest in physiological/molecular mechanisms and biomechanics
- communication-, team- and good English language skills

The environment in Stuttgart enables particularly close cooperation with an interdisciplinary team of sports scientists, biologists, physicists and engineers. Women are specifically invited to apply. The University of Stuttgart further aims to hire more people with disability and also encourages them to apply for research positions.

**Please submit your detailed application in PDF format by 20.09.2019 by email to Sybille Kegreiss <sybille.kegreiss@inspo.uni-stuttgart.de>.**

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