Reasoning of dissertation topic and competency of potential supervisor for admission onto joint LSU and TU doctoral studies in 2019

Area of research (title and code)	**Biomedical Sciences**
Field of research (title and code)	**Biology (01B)**
Topic of research	**Exercise, motor skills and aging**
Institution	**Lithuanian Sports University**

Potential supervisor

Pedagogical and scientific degree	**Name, surname**	**Academic position**
Lect., Dr.	Rima Solianik	Lecturer, researcher

Short reasoning of proposed dissertation topic

Title

Effect of different intensities of exercise on motor memory consolidation in older adults

Summary

Epidemiologic studies show that 12% of the world's population is over 60 years of age; this is projected to increase, by 2050, to 22% of the population (WHO, 2018). Aging is accompanied with brain changes that can limit its functional capacity (Lustig et al., 2009). With advanced age comes changes in sensory and motor system (Bock & Schneider, 2002), which may cause significant reduction in motor skill acquisition in older adults (Seidler, 2006, 2010; Voelcker-Rehage & Alberts, 2005; McDowd & Craik, 1988; Curran, 1997) and affect the ability of older adults to perform activities of daily living and maintain their independence.

There is evidence that motor learning and motor memory consolidation can be promoted with acute exercises performed before or after motor learning in young adults (Roig et al., 2012; Mang et al., 2014; Skriver et al., 2014; Statton et al., 2015; Perini et al., 2016; Snow et al., 2016; Thomas et al., 2016) and children (Ferrer-Uris et al., 2018). It is suggested that timing and intensity of exercise is important for motor memory consolidation in young adults (Roig et al., 2012; Thomas et al., 2016) and children (Ferrer-Uris et al., 2018). Studies showed that the positive effects of acute exercise on motor memory consolidation was maximized when exercise was performed after practice (Roig et al., 2012), and that higher intensity exercise carried out after motor learning task led to superior motor skill retention in young adults (Thomas et al., 2012), whereas studies with children contradicts these conclusions. Study of Ferrer-Uris et al. (2018) showed that the positive effects of acute exercise on motor memory consolidation was maximized when exercise was performed before practice. Thus it seems that the effect of acute exercises is age-dependent. It is noteworthy that we are not aware of any studies that focus on oder adults. Therefore, **the primary aim** of current project is to determine the effect of acute different intensities exercise bouts performed before and after motor learning task on motor memory consolidation in older adults. Furthermore, little and equivocal information is available regarding the effects of long-term exercise on motor learning; there is evidence of positive effects (Bakken et al., 2001) or no effects (Duchesne et al., 2015) on motor skills. Therefore, **the secondary aim** of current project is to determine the effect of different intensity exercises performed for 8-weeks on motor memory acquisition and consolidation in older adults.

Please indicate the links between the proposed topic for the doctoral thesis and health promotion / physical therapy / sports study programs.

Motor skills play an important role in all phases of the life span. It is noteworthy, that motor skills have been found to decline with aging. Older adults need to learn or relearn various motor skills during daily activities or rehabilitation. Therefore, the effective learning strategies for motor skill acquisition and retention is an important issue for healthy living and during implementation of therapeutic approaches for rehabilitation of older adults.

Is the proposed topic for the doctoral thesis related to currently funded research projects? No
Is the proposed topic for the doctoral thesis related to joint research with a foreign institution? No

Currently I am supervisor of 0 doctoral students.

Supervisor _____ Rima Solianik

(signature) (Name, surname)

Date