Marius Brazaitis, dr, biomedicinos mokslai

(Vardas, pavardė, mokslo laipsnis, nurodant mokslo kryptį)

Sporto mokslo and inovacijų institutas

(Padalinio, kuriame dirba, pavadinimas)

LSU

(Institucijos pavadinimas)

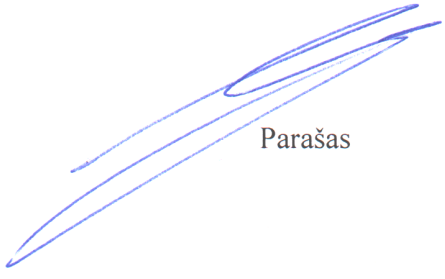
LSU ir TU Biologijos bendros
doktorantūros komiteto pirmininkui

P R A Š Y M A S

2019 m. _kovo_ mėn. _12_d.

Prašau leisti dalyvauti Biologijos mokslų krypties Lietuvos sporto universiteto disertacijų tematikų ir doktorantų vadovų konkurse. Siūlau šią (šias) disertacijos temas (ą) **Effects of local temperature manipulation on neuromuscular fatigability in persons with multiple sclerosis**.

Jeigu šį vadovavimo doktorantui konkrečia disertacijos tema konkursą laimėsiu, visą man paskirto doktoranto studijų laikotarpį vadovausiu ne daugiau kaip 5 biologijos mokslo krypties doktorantams.



Parašas

Marius Brazaitis

Vardas, pavardė

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, Biology, 01B**
Field of research (title and code)	**Physiology, B470**
Topic of research	**Temperature manipulation, stress hormones, motor function, multiple sclerosis**
Institution	**Lithuanian Sports University/ Institute of Sport Science and Innovations**

Potential supervisor

Pedagogical and scientific degree	**Name, surname**	**Academic position**
Prof. PhD	Marius Brazaitis	Professor

Short reasoning of proposed dissertation topic

Title

Effects of local temperature manipulation on neuromuscular fatigability in persons with multiple sclerosis

Summary

Most patients with multiple sclerosis (MS) experience multiple motor symptoms that induce gait difficulty and increase the risk for falls **(Noseworthy et al., 2000)** and other physical, cognitive and neurological symptoms. Fatigue is one of the most common symptoms of MS and can have a major effect on health-related quality of life **(Johnson, 2008; Kyguoliene et al., 2018)**. Considering that 60-80% of the MS patients present adverse clinical symptoms when their body temperature is increased (not only due to physical working but even when immerse in hot water) **(Guthrie and Nelson, 1995)**, the need for the development of treatment strategies to overcome the thermoregulatory problem in these patients is crucial. In addition to this problem, research data suggest that pre-cooling therapy can prevent the symptom worsening due to increased body temperature in MS patients without causing adverse effects. The thermo-transient receptor potentials (TRPs), however, a recently discovered family of ion channels activated by temperature, are expressed in primary sensory nerve terminals where they provide information about thermal changes in the environment **(Patapoutian et al. 2003)**. Exposure to temperature of 45°C activates TRPV1 channel and exposure to temperature of 18°C activates TRPA1 channel which are sufficient to trigger functional fundamental pathway for heat/cold thermoregulatory control in preoptic area **(Morrison, 2011)**. The effect of surface neck and head cooling/heating on neuromuscular functioning during prolonged submaximal exercise has not been investigated in MS. In our study, we hypothesize that local cooling rather than local heating by activating central thermoregulatory pathway in MS patients would be a sufficient stimulus to induce greater dopaminergic activity during prolonged exercise and would be associated with stronger ergogenic effects, delayed central fatigue and more positive emotions and motivations. Therefore, such temperature strategy could serve as a complimentary therapeutic approach in MS.

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

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 ___3___ doctoral students.

_____ Marius Brazaitis

Supervisor

(Signature)

(Name, surname)

Date: 2019 03 12