Reasoning of dissertation topic and competency of potential supervisor for admission into LSU biology doctoral studies with a participation of Tartu university 2025

Area of research (title and code)	**Natural Sciences**
Field of research (title and code)	**Biology (N 010)**
Topic of research	**IMPLICATIONS FOR HAMSTRING INJURY PREVENTION: HIGH-VELOCITY AND COMBINED HIGH-VELOCITY AND ECCENTRIC EXERCISE STRATEGIES IN YOUNG ATHLETES**
Institution	**Lithuanian sports university**

Potential supervisor

Pedagogical and scientific degree	**Name, surname**	**Academic position**
Assoc Prof. PhD.	Mantas Mickevičius	Senior researcher

Short reasoning of proposed dissertation topic

Title
IMPLICATIONS FOR HAMSTRING INJURY PREVENTION: HIGH-VELOCITY AND COMBINED HIGH-VELOCITY AND ECCENTRIC EXERCISE STRATEGIES IN YOUNG ATHLETES
Short research description (including aims and objectives) (maximum 1500 characters). We hypothesize that implementing a high-velocity elastic band training strategy will induce neural and peripheral adaptations (Kamandulis et al., 2020), beneficial for young athletes who demands rapid changes in direction, jumps, and sprints. Through the systematic manipulation of exercise volume and intensity, the incorporation of both velocity and eccentric strength-based exercises, and a comprehensive investigation conducted in real athletic settings, we expect to enhance our understanding of the relationships between different type exercises and they potential for injury prevention. During the study we will measure in detail the skeletal muscle function (torque, range of motion, movement frequency), morphological (thickness and fibers pennation angle) and mechanical (stiffness) properties, which all are reflecting neuromuscular adaptation in general. Additionally, muscle electromyography will be employed to evaluate the possible modifications in muscle recruitment patterns indicative of neural adaptation. Participants demographics, including age, stature, body mass, leg dominance, sport and medical history, playing position, level of competition, number of training sessions attended, and matches played in the current season, will be also recorded. These data will be associated with hamstring injury occurrences. We will enroll young athletes participating in team sports such as football, basketball, volleyball, and handball as they are known to have an increased susceptibility to hamstring injuries (Ekstrand et al., 2016; Maniar et al.2023). The focus will be on post-pubertal athletes to mitigate maturity-related issues.