CSABA KOZMA

National Scientists Academy, 3rd year

University of Szeged,
Faculty of Science and Informatics, Biology, 3rd year

YEAR OF BIRTH:

2001

FORMER SZENT-GYÖRGYI PUPIL:

no

SZENT-GYÖRGYI MENTOR:

József Mihály

JUNIOR MENTOR:

Szilárd Szikora

SPECIALIZATION:

molecular cell biology

SECONDARY SCHOOL:

Petőfi Sándor Secondary School, Bonyhád

NAME OF TEACHER:

Csaba Péter

LANGUAGES:

English/intermediate

IMPORTANCE, AIMS AND POSSIBLE OUTCOME OF RESEARCH

Sarcomeres are the basic contractile units of muscles. They are composed of three major filament systems: the filamentous actin based thin filament array, the myosin based thick filaments and the titin based elastic filament system. The structure of sarcomeres has been well characterized, leading to quasi-atomic models of thin and thick filaments. However, the exact spatial arrangement of many of the major muscle proteins remained unknown. In addition, several key aspects of microfilament array formation and dynamics are not yet clarified. Our research group used a Single Molecular Localization Microscopy system to collect imagines of Drosophila melanogaster flight muscle sarcomeres, which are highly similar to the striated muscles of vertebrates. Our group also created a nanoscopic protein localization atlas, which includes 22 muscle proteins. Our studies were so far focused on the muscles of 1 day old adult specimens, however, to obtain developmental insights, it is necessary to examine both earlier and later developmental time points, in order to map the distribution of proteins during the actively elongating phases of sarcomere development, as well as in mature or ageing muscles. Our aim is to better understand how sarcomeres are organized and get assembled during sarcomerogenesis; to determine the position of novel muscle proteins; to test the predictions of our new I-band and H-zone model and to probe the evolutionary conservation of the fruity fly protein distribution data in mouse myofibrils. These pieces of information are indispensable in order to understand the details of sarcomere assembly and function in healthy and in disease conditions.

AMBITIONS AND CAREER GOALS

During my research, I would like to acquire as much methodological and theoretical knowledge as possible, which can be helpful in my further work. I find it important to have a greater insight into the research work during my university years, which will help me make decisions about my long-term plans. After graduating with my MSc degree, I would like to get a PhD degree and then work as a researcher.

HONORS AND PRIZES

2019 - 30th International Biology Olympiad, Hungary, Gold Medal
2019 - Biology OKTV category II, 2nd place
2018 - Biology OKTV category I, 1st place
2018 - SZTE Szent-Györgyi Competition, 1st place
2018 - Richter Gedeon Talent Scholarship
2017 - 15th European Union Science Olympiad, Denmark, Silver Medal
2016 - 13th International Junior Science Olympiad, Indonesia, Silver Medal
2016; 2017; 2018; 2019 - Dr. Árokszállásy Zoltán Biology Competition, 1st place, 2nd place, 1st place, 2nd place

PUBLICATIONS

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