CSABA BALOGH

National Academy of Scientist Education, 4th year

University of Debrecen
Faculty of Medicine, 4th year

YEAR OF BIRTH

2001

FORMER SZENT-GYÖRGYI PUPIL

no

RESEARCH UNIT

University of Debrecen

SZENT-GYÖRGYI MENTOR

Beatrix Dienes

JUNIOR MENTOR

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SPECIALIZATION

Muscle physiology, mechanosensitive ion channels

SECONDARY SCHOOL

Deák Ferenc Secondary Grammar School, Fehérgyarmat

NAME OF TEACHER

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LANGUAGES

English/proficiency
Germany/intermediate
Russian/proficiency
Ukrainian/proficiency

IMPORTANCE, AIMS AND POSSIBLE OUTCOME OF RESEARCH

Skeletal muscle contraction is based on the process of electromechanical coupling (EC coupling), in which the voltage sensor DHPR (CaV1.1) plays a key role in regulating Ca^{2+}release from the sarcoplasmic reticulum. The movement of voltage-sensing domains can be measured as charge movement, which is a direct electrical indicator of the first step of EC coupling. The aim of our research is to quantitatively compare the charge movement properties in the skeletal muscle fibers of CaV1.1Δe29 mutant mice expressing the embryonic isoform of DHPR with those of control animals and to identify any functional differences. To this end, we perform whole-cell patch-clamp measurements and process the data using analysis software developed by us and automated evaluation based on neural networks. The expected outcome of the research is to provide a more accurate picture of the effect of DHPR isoform switching on the EC coupling mechanism and to contribute to a better understanding of the pathomechanism of muscle diseases associated with calcium signal transduction disorders. As a further plan, we intend to investigate models of other muscle diseases.

AMBITIONS AND CAREER GOALS

By systematically combining engineering informatics and medical knowledge, I aim to develop software tools capable of accurately analyzing muscle function based on laboratory measurements. In the future, I would like to obtain a PhD degree and apply my knowledge and experience in the research and clinical sectors, both as a clinician and a researcher.

HONORS AND PRIZES

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PUBLICATIONS

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