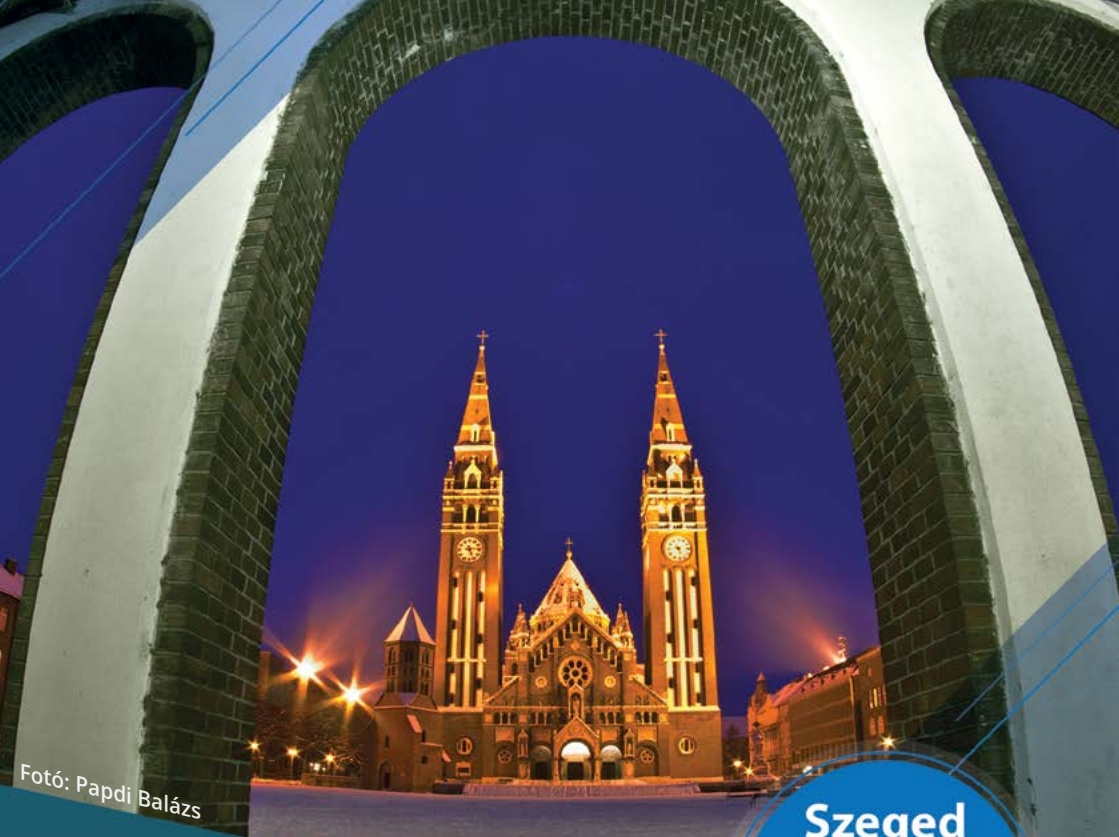




Fotó: Papdi Balázs

Szeged
2020.
december
3–4.

NOBEL-DÍJASOK ÉS TEHETSÉGES DIÁKOK XV. TALÁLKOZÓJA

A Szegedi Orvosbiológiai Kutatások Jövőjéért Alapítvány,
a Szegedi Biológiai Kutatóközpont és a Szegedi
Tudományegyetem közös programja



SZEGEDI TUDÓS AKADÉMIA
SZEGED SCIENTISTS ACADEMY

Analog model of the human cardiovascular system

The aim of the project was to create a system of a model that demonstrates the human blood circulation and auxiliary software which together display the nature of the circulatory system, the peculiarities of its operation, its structure and illnesses. The model serves as a demonstration tool to the study material presented by the software. It also shows information based on data provided by various sensors embedded into the model. This information is very similar to what one should expect from the real circulatory system, and thus carry immense value regarding educational purposes.

MESZLÉNYI VALÉRIA ÉVA

Alterations of motor axon terminals in mice due to passive transfer with sera of amyotrophic lateral sclerosis patients with identified mutations

Introduction: Amyotrophic lateral sclerosis (ALS) is an incurable neurodegenerative disease affecting the motor neurons in the brain and spinal cord, leading to the loss of voluntary muscle function. ALS can be classified as familial or sporadic based on its inheritance. Previously, our research group demonstrated an increase of the calcium level and increase of the number of synaptic vesicles in the motor axon terminals (MATs) of sporadic ALS patients. These alterations could be conferred to mice via passive transfer of the sera from these patients. In the present experiment we aimed to question the similar effect of the sera from another population of patients, which possess identified mutations.

Methods: Patients with 11 different ALS-related mutations participated in our study. Balb/c mice were injected intraperitoneally with sera of ALS patients or healthy individuals for two days. After the passive transfer, calcium histochemistry was performed and MATs in the interosseus muscles were investigated under electron microscope. Intracellular calcium content and synaptic vesicle number was quantified.

Results: Passive transfer resulted in significant increase of intracellular calcium levels and synaptic vesicle number in the MATs of mice due to the passive transfer of sera from ALS patients with identified mutations, similar to sera from sporadic ALS patients. In addition, ultrastructural signs of degeneration were also observed at the neuro-muscular synapses.

Discussion: Our findings support the unifying hypothesis, that the pathomechanism underlying the identical manifestation of the disease with or without identified mutations is based on a common final pathway, in which calcium increase plays a central role.

A Nobel-díjasok és
tehetséges diákok XV. találkozója
rendezvény támogatói:



Szeged Megyei Jogú Város



MAGYARORSZÁG
KORMÁNYA

*A Szegedi Orvosbiológiai Kutatások Jövőjéért Alapítvány Szegedi Tudós Akadémia Programja az
Innovációs és Technológiai Minisztérium támogatásával valósul meg (FEIF/433-4/2020-ITM_SZERZ).*