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OPTEGENETICS: A NEW HORIZON IN ALZHEIMER'S DISEASE THERAPY

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Alzheimer's disease is a real scourge of the 21st century. This neurodegenerative disease ranks first in terms of harmful effects on the economy, among other diseases. Neurobiologists have offered a new way to cure the initial phase of Alzheimer's disease which is a neurodegenerative illness, the most popular form of dementia. The first stage of this disease is characterized by the defection of long-term episodic memory. Scientists from the Massachusetts Institute of Technology are working on suppressing memory disorder with usage optogenetic, using lighting stimulation genetically modified neurons of hippocampus dentate gyrus. It should be noted that the illness considers clinical incurable now. And it is even though today about 30 million people all over the world suffer from Alzheimer's disease, and more than six percent of all 65 years old people have this illness.

The optogenetic method paves the way for selective stimulation of specific neurons from neuron clusters. It is achieved by the technology of the addition Ion channel into the neuron's membrane. Those channels react to the light wave with a specific length - opsins. When absorbing light of a certain wavelength, these transport proteins pass specific ions that lead to depolarization and excitation of only the studied neurons. Thus investigated neurons are depolarized and stimulated.

Neurobiologists have conducted an experiment in mice with some memory defection. Scientists put the mouse in a box with weak electricity. Then scientists marked which neurons were responsible for the creation of unpleasant experiences. After some time, with the optogenetics approach applied, marked neurons were stimulated and the mouse felt fear. Systemic stimulation of these neurons helped animals keep in mind that the box is dangerous. Optogenetics can become a really important medicine tool. By stimulating the optogenetic method, we can partially restore memory. This method can help to treat epilepsy, migraine, insomnia, and other diseases. It is considered promising in cardiology and psychotherapy.

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