Glutamate Research Could Lead to ALS Treatment

Decades of research on the neurotransmitter glutamate have produced promising results that could lead to treatment for Amyotrophic Lateral Sclerosis (ALS). Scientists believe excessive exposure to glutamate may be one of the reasons that nerve cells (motor neurons) die in ALS. Preventing the rise of glutamate levels could be the key to protecting motor neurons and impeding the progress of the disease.

Though too much glutamate can be toxic, normal levels of glutamate are necessary for the nervous system to function properly. Scientists are cautious to select a drug that would clear the excess glutamate while maintaining normal glutamate levels.

Many attempts have been made to find therapy that would reduce glutamate injury. Although Riluzole - the only approved drug for ALS treatment - is believed to regulate the glutamate system, the therapeutic benefits of this drug are modest. As a result, scientists are developing ways to quickly test the effectiveness of other drugs against ALS.

The ALS Association partnered with the National Institutes of Neurological Disorders and Stroke to screen a series of potential drugs. From this initiative, researchers demonstrated that Ceftriaxone helped mice live longer, and initiated a clinical trial for this drug. Albeit an exciting finding in mice, data analysis from the trial indicated that it was not effective in patients. The search continues for drugs that fight ALS.

Recent studies have shed light on the glutamate system. Scientists are understanding more about the mechanisms that increase levels of EAAT2, a cellular component that removes excess glutamate before it can build up and damage motor neurons. Understanding more about how this system works may help researchers develop treatment.

However, many factors are involved in the biology of ALS, and it is unclear whether any drug that specifically targets the glutamate system will be the most effective way to treat the disease. Despite the challenges, scientists believe the progress in glutamate research is cause for optimism and could lead to treatment for ALS.

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The ALS Association gratefully acknowledges Dr. Page Jones for volunteering to update this information. Dr. Jones has a Doctorate of Philosophy in Environmental Health Sciences, and a Master of Science in Environmental Science. Her doctoral thesis pertained to ALS, she has co-authored a book and published abstracts about ALS research and her research assistantship involved work in the characterization of ALS disease progression.