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Modifying and Enhancing Lamotrigine with Allicin

CONFERENCE ABSTRACT

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Abstract

Lamotrigine is an anticonvulsant and mood stabilizer drug that was first put on the market in 1994 in the United States. Lamotrigine is primarily used to treat partial seizures, tonic-clonic seizures, bipolar I disorder, and Lennox-Gastaut syndrome. Other off-label uses include treating acute bipolar depression, fibromyalgia, schizophrenia, and unipolar depression as well. Lamotrigine’s mechanism of action is not fully defined, but likely targets and inhibits voltage-gated sodium channels found in neurons, suppressing the release of the excitatory amino acid glutamate. Toxicity in lamotrigine is associated with severe central nervous system depression, seizures, cardiac conduction delays, and wide complex tachycardia. This study will examine combining lamotrigine (lamictal) with allicin (diallylthiosulfinate) and how it enhances its pharmacological effects. Allicin is a well known medicinal compound used for thousands of years, known for its antimicrobial, antioxidant, anti-inflammatory, and cardiovascular protective properties. Under ammonia (NH₃) and heat, a substitution for organic reaction to produce our modified drug can be created. A double bond in allicin will break down and substitute one of the chlorine atoms on Lamotrigine, resulting in the modified drug and HCl as a byproduct of this reaction. It is expected to see increased flexibility and polarity, and decreased insaturation. The new drug should have better potency, stability, and solubility when metabolized and absorbed through

permeable membranes. Allicin will be sourced from freshly crushed up garlic, and with alterations it may help with treating partial seizures and bipolar disorder maintenance.

Keywords: lamotrigine, lamictal, allicin, diallythiosulfinate, bipolar I, Lennox-Gastaut syndrome