Synthesizing a Novel Family of Multifactorial Inhibitors to Treat Alzheimer's

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Research Significance: Alzheimer's disease affects nearly 52 million individuals worldwide, with projections indicating a significant increase to 75 million by 2030 and a staggering 152 million by 2050. This escalating prevalence underscores the urgent need for effective treatments. While current medications offer symptomatic relief, a complete cure remains elusive. The quest for new acetylcholinesterase enzyme inhibitors, crucial for combating Alzheimer's, has sparked widespread scientific inquiry. Acknowledging this imperative, I have prioritized the initiation of this project to contribute to the ongoing global efforts. Objective: Our primary objective is to synthesize a novel inhibitor using a cost-effective, catalyst-free one-pot multi-component reaction. Research Focus: Our research endeavors center on the synthesis and comprehensive investigation of the functional properties of the newly developed inhibitor. By elucidating its molecular mechanisms and pharmacological effects, we aim to lay the groundwork for the creation of more potent and efficacious biological additives and drug formulations. Outcome: Our endeavors have culminated in the successful synthesis of the novel inhibitor, demonstrating remarkable inhibitory effects on critical enzymes implicated in Alzheimer's pathology. Notably, our inhibitor exhibits potency levels surpassing those of conventional drugs by 5-10 times. This breakthrough holds immense promise for the development of highly effective and internationally competitive treatments against Alzheimer's disease and other related ailments. Moreover, the ecological sustainability of our approach underscores its potential to meet the stringent requirements of global standards.