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Design, Synthesis, and Structure-Activity Relationship Study of Thiohydantoin Derivatives

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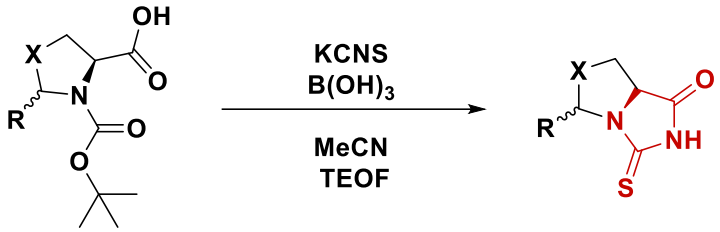
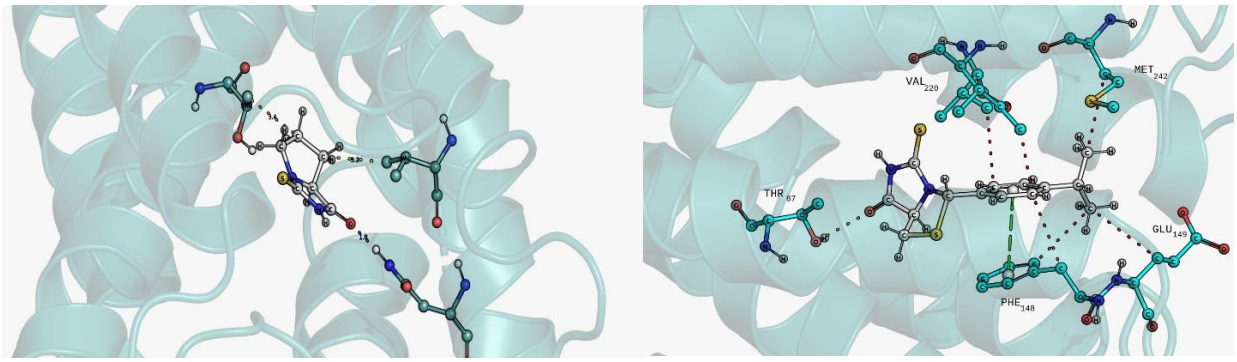
ABSTRACT

Hydantoins and thiohydantoins are recognized as "privileged structures" due to their significant chemical and pharmacological applications, appearing in various biological matrices with medicinal properties.[1] These structures are present in several high-value drugs, such as phenytoin, mephenytoin, and nitrofurantoin.[2] Despite the availability of three classical synthesis reactions for these molecules,[3] there remains a demand for new methodologies that are simpler, more cost-effective, and in line with green chemistry principles, particularly for the synthesis of fused bicyclic thiohydantoins. This study focused on the synthesis and optimization of reaction conditions, exploring variables such as reagent concentration, the use of $B(OH)_3$ as a catalyst,[4] and different solvents, with thiazolidines as the starting materials to obtain fused thiohydantoins. Additionally *in silico* methods were employed to predict and analyze the physicochemical and biological properties of the synthesized compounds, laying a solid foundation for their future therapeutic applications and offering new perspectives for the development of innovative drugs.





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