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Synthesis, Characterization of Ibuprofen N-Acyl-1,3,4-Oxadiazole Derivatives and Anticancer Activity against MCF-7 Cell Line

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ABSTRACT
Purpose: To synthesis and investigate the anti- cancer activity of some ibuprofen-oxadiazole derivatives as a molecular hybrid model.
Method: Five derivatives of Ibuprofen-Oxadiazole have been synthesized from ibuprofen through several steps to obtained and identified the final derivatives by analytical techniques, FTIR, 1HNMR and elemental analysis. All the derivatives were evaluated for their anticancer activity by MTT assay. The possibility to improve the physical properties of ibuprofen and also give an additional biological activity, so our research was an application of this idea. The synthesized derivatives were studied theoretically, and some chemical parameters were calculated using the PM3 method to study the stability of derivatives IV (a-e).
Results: showed that the synthesized derivatives revealed promising in vitro cytotoxicity.
Conclusion: The molecular hybrid system of ibuprofen-oxadizole has demonstrated additional biological effectiveness for ibuprofen.
Keywords: Oxadiazole, Ibuprofen, Hybrid molecule, anticancer, Ibuprofen-1,3,4-oxadiazole.
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INTRODUCTION

Over the last few years, the molecular hybridization technique has emerged as a novel approach involving the confluence of two or more pharmacophores in a single molecular scaffold for the creation of multifunctional hybrid molecules[1].

These molecules may be further modified to demonstrate beneficial pharmacokinetics and bioavailability for oral use. Several research groups invented and synthesized multiple synthetic molecules using this approach[2]. Although

Given the great medicinal significance and material applications, several synthetic routes have been developed for oxadiazole conjugated with another biological molecule, so ibuprofen conjugated with oxadiazole to investigate the possible biological activity. The majority of them are based on the preparation acid hydrazide from aromatic acid and converted to hydrazone derivative, followed by direct cyclization by acetic anhydride as dehydration agent. The antiproliferative effect of ibuprofen on different cancer cell line was studied [17].