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Abstract

Synthesis and Antimicrobial Activity of Newly Synthesized 2-((5-(4-(5(6)fluoro-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-1,3,4-oxadiazol-2-yl)thio)-Derivatives †

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Benzimidazole derivatives have a great deal of interest in terms of antimicrobial therapy. Thus, in the present study, new benzimidazole derivatives were obtained to perform antimicrobial activity. The 4-(5(6)fluoro-1*H*-benzo[*d*]imidazol-2-yl)benzoate (**1**) obtained by 4-fluoro-o-phenylenediamine and methyl 4-formylbenzoate, was reacted with hydrazine hydrate to afford 4-(5(6)fluoro-1*H*-benzo[*d*]imidazol-2-yl)benzohydrazide (**2**). The reaction of compound **2** with CS_2 in the presence of NaOH gave 5-(4-(5(6)fluoro-1*H*-benzo[*d*]imidazol-2-yl)phenyl)-1,3,4-oxadiazole-2-thiol (**3**), which was reacted with substituted bromide derivatives to obtain final compounds.

The structures of all the compounds were established on the basis of elemental and spectral analysis. Antimicrobial activities of the compounds against resistant human pathogenic microorganisms were evaluated according to the CLSI methods [1,2]. Final products were tested for their in vitro growth inhibitory activity against human pathogenic *Escherichia coli* (ATCC 35218), *Escherichia coli* (ATCC 25922), *Staphylococcus aureus* (ATCC 25923), *Pseudomona aeuroginosa* (ATCC 27853), and yeast as *Candida albicans* (ATCC 90028), *Candida glabrata* (ATCC 90030), *Candida krusei* (ATCC 6258), and *Candida parapsilosis* (ATCC 22019). Chloramphenicol and ketoconazole were used as control drugs. The compound **4I** containing 3,4-dihydroxyphenyl moiety in its structure exhibited the highest activity against *Candida krusei* ATCC 6258, *Candida glabrata* ATCC 90030, and *Candida parapsilosis* ATCC 22019. Furthermore, the cytotoxic effects of the synthesized compounds were determined by in vitro activity tests.

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