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United Arab Emirates University

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**Master Thesis Defense**

Entitled

*SYNTHESIS AND BIOLOGICAL APPLICATIONS OF SOME NOVEL UREA AND THIOUREA-BENZIMIDAZOLE DERIVATIVES*

by

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Abstract

The objective of this research is the synthesis and characterization of novel urea and thiourea-benzimidazole derivatives and to test their biological activities. The 17 novel compounds (57a-57j), (58a-58d), 62, 63 and 65 have been synthesized, purified by different techniques such as extraction and column chromatography and then characterized, by using suitable spectroscopic techniques including  $^1\text{H-NMR}$ ,  $^{13}\text{C-NMR}$ , and IR spectroscopy techniques. The biological activity of these compounds has been studied. The antibacterial activity was evaluated at different concentrations ( $\mu\text{g}/\text{ml}$ ) against 6 types of bacteria (*Escherichia coli*, *Pseudomonas aeruginosa*, *Salmonella enterica*, *Klebsiella pneumoniae*, *Staphylococcus aureus* and *Enterococcus faecalis*). Several compounds showed activity against enterococcus 29212 and 65 showed activity against p.aeruginosa 27853 and s.aureus 25923, with different concentrations ranged 33.4- 96.3 $\mu\text{g}/\text{ml}$ . The antifungal activity of these compounds has been tested against 4 types of fungi (*Fusarium solani*, *botrytis cinerea*, *thielaviopsis punctulate* and *neoscytalidium dimidiatum*) and they showed negative results at 250  $\mu\text{M}$ . In the photophysical study, the photoproperties of compound **65** have been studied through host-guest complexes. The fluorescence of compound **65** was quenched upon the addition of CB7 by first interaction with benzimidazole site and then with the 8-hydroxyquinoline site in compound **65**. The fluorescence was restored by the addition of cadaverine due to the replacement of benzimidazole site with cadaverine in the CB7 cavity.

**Keywords:** Urea, Thiourea, Benzimidazole, Piperazine, anti-bacterial, antifungal, Photochemistry.