

Communication

## Synthesis and Anti-Bacterial Activities of a Bis-Chalcone Derived from Thiophene and Its Bis-Cyclized Products

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**Abstract:** A chalcone was prepared by the reaction of terephthalaldehyde with 3-acetyl-2,5-dimethylthiophene. Treatment of this chalcone with thiosemicarbazide/phenyl hydrazine/guanidine hydrochloride/thiourea afforded the corresponding pyrazoline, pyrazole, and pyrimidine in good yields. All the new compounds have been characterized by IR, <sup>1</sup>H-NMR, <sup>13</sup>C-NMR, GC-MS and elemental analyses. The anti-bacterial activity of these compounds were first tested *in vitro* by the disk diffusion assay against two Gram-positive and two Gram-negative bacteria, and then the minimum inhibitory concentration (MIC) was determined with the reference of standard drug chloramphenicol. The results showed that the pyrazoline derivative is better at inhibiting growth of both types of bacteria (Gram-positive and Gram-negative) compared to chloramphenicol.

**Keywords:** chalcone; pyrazoline; pyrimidine; anti-bacterial activity; chloramphenicol

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### 1. Introduction

$\alpha,\beta$ -Unsaturated ketones are biogenetic precursors of flavonoids in higher plants. Also known chemically as chalcones, they consist of open-chain flavonoids in which the two aromatic rings are joined by a three carbon chain [1]. They display a wide range of pharmacological properties, including cytotoxicity towards cancer cell lines [2,3], antimetabolic [4], antimutagenic [5] and antitumor-promoting activities; antibacterial [6], antiviral [7], anti-inflammatory [8], antiulcerative [9] and hepatoprotective