



## البحث الثاني

### "Synthesis, Antibacterial Activity, and Fluorescence Properties of A Novel Series from [2,4-Dioxochromen-3(4H)Methyl]-Amino Acid"

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#### **Abstract:**

A new solvent-free method for synthesis of starting compounds 2,4-dioxochromen-3(4H)methyl amino acetic acid derivatives **1a–e** via a green approach is reported. Also, the behavior of compound **1a** towards various nitrogen nucleophiles such as primary amines, hydrazine hydrate, and hydroxylamine hydrochloride to give corresponding compounds **2–4** was studied. Furthermore, chlorination of compound **1a** using a mixture of  $\text{PCl}_5/\text{POCl}_3$  to yield acid chloride derivative **5** and the reaction of the latter compound **5** with various amino acids to obtain dipeptide compounds **6a–e** are described. Moreover, cyclization of compound **1a** in alkaline medium to afford dihydrochromeno[3,4-c]pyrrole-1-carboxylic acid **7** and cyclization of **6b** in acidic medium, namely  $\text{Ac}_2\text{O}$ , to yield piperazine derivative **8** are reported. Also, reaction of compound **1a** with maleic anhydride in dioxane to afford Diels–Alder adduct **9**, which posteriorly reacted with hydrazine hydrate to give **10**, was investigated. Most of the newly synthesized compounds were screened against Gram-positive and Gram-negative bacteria, with compound **5** exhibiting the maximum inhibition zone towards all four types of bacteria. In addition, the absorption and fluorescence emission of some of the substituted coumarins were studied in dioxane, revealing that the substituents altered both the absorption and fluorescence emission maxima.