

## ABSTRACT

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Title: Synthesis And Determination Of Stability Of  $\beta$ -Ketoesters And  $\beta$ -Ketoamides Under Physiological Conditions  
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Year: 2021

Antibiotic resistance is a global threat, particularly in the United States, and is often the result of the overuse of antibiotics. One promising method that could potentially be used in place of antibiotics is the use of “nonantibiotic” synthetic molecules that interfere with quorum sensing (QS). The use of acetophenone and its analogues for the syntheses of  $\beta$ -ketoesters and  $\beta$ -ketoamides remains a promising synthetic route to inhibit QS in various strains of Gram-negative bacteria. Once successfully synthesized, the  $\beta$ -ketoamides must undergo rigorous solubility and stability analyses. These analyses will provide pertinent information on the properties of the molecules which can be utilized to assay the functionality of the compounds under physiological conditions. Using High Performance Liquid Chromatography (HPLC) and spectrophotometry with various buffer solutions, the solubility and metabolic stability properties of  $\beta$ -ketoamides can be determined. Results of this study will be utilized to determine the optimized synthesis conditions for various acetophenone analogues and physiological properties of  $\beta$ -ketoamides.