Establishment of an Efficient Method for the Synthesis of SRH, an Important Molecule in Bacterial Quorum Sensing

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INTRODUCTION

System Two: Quorum Sensing (QS): The process of intrageneric bacterial cell-to-cell communication

FIRST ATTEMPT: Unsuccessful at Acquiring SRH

THIRD ATTEMPT: Successful Synthesis and Quantification of SRH

Why Synthesize SRH?

1) SRH acts as a signaling molecule for many different bacteria.
2) Many different bacterial species produce SRH.
3) SRH is a potent agonist of the LuxR homologous receptors.

SECOND ATTEMPT: Successful Synthesis of SRH without Quantification

Analysis

ACHEMICAL CHARACTERIZATION

References:

Bioluminescence

SBH reacts with Virulence

General

Bacterial quorum sensing is a form of cell-to-cell communication that allows bacteria to coordinate their behavior in response to changes in their environment. This is achieved through the production and detection of small signaling molecules, known as diffusible signal factors (DSFs). Among these DSFs, LuxS homologs play a key role in regulating the expression of genes involved in virulence and antibiotic resistance. Here, we describe the synthesis and biological characterization of SRH, an important molecule in bacterial quorum sensing.

For the production of SRH, we employed a synthetic route that involved the coupling of the amino acid moiety with the ribose moiety. This coupling was achieved using a Mitsunobu reaction. The obtained TFA salt of SRH was a pure, powdery solid. The process of interspecies communication involves the release of these signaling molecules into the environment, where they can be detected by neighboring cells. This intercellular communication allows bacteria to make informed decisions about their growth and virulence strategies. Understanding the mechanisms and pathways of quorum sensing is crucial for the development of new antimicrobial strategies.

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