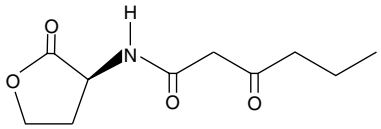
Product Information

N-(β-ketocaproyl)-L-Homoserine lactone

Item No. 10011207

CAS Registry No.: 143537-62-6
Formal Name: 3-oxo-N-[(3S)-tetrahydro-2-oxo-3-furanyl]-hexanamide
Synonym: 3-O-C_6-(L)-HSL
MF: $C_{10}H_{15}NO_4$
FW: 213.2
Purity: ≥95%
Stability: ≥2 years at -20°C
Supplied as: A crystalline solid



Laboratory Procedures

For long term storage, we suggest that N-(β-ketocaproyl)-L-homoserine lactone (HSL) be stored as supplied at -20°C. It should be stable for at least two years.

N-(β-ketocaproyl)-L-HSL is supplied as a crystalline solid. A stock solution may be made by dissolving the N-(β-ketocaproyl)-L-Homoserine lactone in an organic solvent purged with an inert gas. N-(β-ketocaproyl)-L-HSL is soluble in organic solvents such as DMSO and dimethyl formamide. The solubility of N-(β-ketocaproyl)-L-HSL in these solvents is approximately 30 mg/ml. While N-(β-ketocaproyl)-L-HSL is also soluble in ethanol and other primary alcohols, their use is not recommended as they have been shown to open the lactone ring

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of N-(β-ketocaproyl)-L-HSL can be prepared by directly dissolving the crystalline compound in aqueous buffers. The solubility of N-(β-ketocaproyl)-L-HSL in PBS, pH 7.2, is approximately 5 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Quorum sensing is a regulatory system used by bacteria for controlling gene expression in response to increasing cell density.[1] This regulatory process manifests itself with a variety of phenotypes including biofilm formation and virulence factor production.[2] Coordinated gene expression is achieved by the production, release, and detection of small diffusible signal molecules called autoinducers. The N-acylated homoserine lactones (AHLs) comprise one such class of autoinducers, each of which generally consists of a fatty acid coupled with HSL. Regulation of bacterial quorum sensing signaling systems to inhibit pathogenesis represents a new approach to antimicrobial therapy in the treatment of infectious diseases.[3] AHLs vary in acyl group length (C_4-C_{18}), in the substitution of C3 (hydrogen, hydroxyl, or oxo group), and in the presence or absence of one or more carbon-carbon double bonds in the fatty acid chain. These differences confer signal specificity through the affinity of transcriptional regulators of the LuxR family.[4] In one of the most-studied quorum-sensing systems in gram-negative bacteria, the LuxI AHL synthase catalyzes the production of 3-O-C_6-(L)-HSL utilizing S-adenosylmethionine and hexanoyl-acyl carrier protein as reaction substrates in the marine bioluminescence bacterium *V. fischeri*.[5] At increased populations of the bacteria, localized higher concentrations of 3-O-C_6-HSL, an endogenous ligand to transcriptional factor LuxR, lead to increased production of both the AHL synthase and proteins responsible for bioluminescence.[1] Numerous other species of bacteria also employ 3-O-C_6-HSL in cell-to-cell communication.[6-9]

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Product Information

References

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