EuroSciCon

EuroSciCon Conference on

Biochemical, Chemical Engineering & Mass Spectrometry

November 19-20, 2018
Prague, Czech Republic

Arch Chem 2018, Volume: 2
DOI: 10.21767/2572-4657-C4-012

PRODUCTION OF 5-AMINOLEVULINIC ACID IN ESCHERICHIA COLI BY OVEREXPRESSING PUTATIVE AMINOLEVULINIC ACID SYNTHASE OF STREPTOMYCES NODOSUS ASUKAENSIS

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The 5-aminolevulinic acid (ALA) has medical application for cancer and tumor diagnosis. The production of ALA using recombinant Escherichia coli (E. coli) has been previously studied, in which *the hemA* gene from *Rhodobacter spaeroides or Bradyrhizobium japonicum* was expressed. Recently, bioinformatic studies with complementary experiments revealed that the asuD2 gene located in asukamycin biosynthetic gene cluster of *Streptomyces nodosus asukaensis*, encoded aminolevulinic acid synthase. This study aimed to elucidate the putative function of asuD2 and then produce ALA in E. coli by overexpressing this gene. Sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) was performed to examine asuD2 expression in the recombinant *E.coli*. Thin layer chromatography (TLC) and mass spectroscopic analysis showed that crude enzyme of asuD2 catalyzes the synthesis of ALA by condensation reaction between glycine and succinyl CoA. Recombinant *E.coli* cells expressing asuD2 were cultured in M9 medium at 28 °C. The effects of expression vector and induction conditions were investigated. The effect of glycine, succinic acid, and medium components were examined. In bioreactor cultures, cell growth and production were monitored.

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