RIBOSOMAL SYNTHESIS OF KETONE-CONTAINING PEPTIDE BACKBONE VIA O TO C ACYL SHIFT

Tech ID: 33502 / UC Case 2024-105-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

Ribosomes, traditionally known for catalyzing amide bond formation, have been found to also promote reactions involving various non-canonical amino acids, alpha-hydroxy acids, and certain beta-hydroxy/amino acids. This document describes a new discovery: peptides containing a dehydrolactic acid motif can rapidly isomerize to a backbone-embedded α,γ-diketoamide via a spontaneous O to C acyl shift. This reaction introduces a newly formed backbone C–C bond as a ketone, addressing a long-standing challenge in generating internal C–C bonds within genetically encoded polypeptides.

SUGGESTED USES

This novel O to C acyl shift can be utilized for the synthesis of ketone-containing peptide backbones. This strategy is applicable across various peptide synthesis methods, including ribosomal synthesis, solid-phase peptide synthesis, and general chemical synthesis. It provides a new approach to edit the peptide backbone by incorporating C–C bonds as ketones internally.

ADVANTAGES

The primary advantage of this discovery is providing a general strategy to build C–C bonds as ketones internally within a genetically encoded polypeptide backbone, which was previously unachieved by ribosomal methods and limited to enzymatic or chemical modifications at termini or side chains. The isomerization occurs spontaneously, simplifying the process. This expanded reactivity of ribosomes beyond canonical amide bond formation opens up new avenues for designing and synthesizing peptides with diverse backbone structures.

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Methods To Generate Novel Acyl-Trna Species
- Nuclear Delivery and Transcriptional Repression with a Cell-penetrant MeCP2

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OTHER INFORMATION

CATEGORIZED AS

» Biotechnology

» Proteomics

RELATED CASES

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