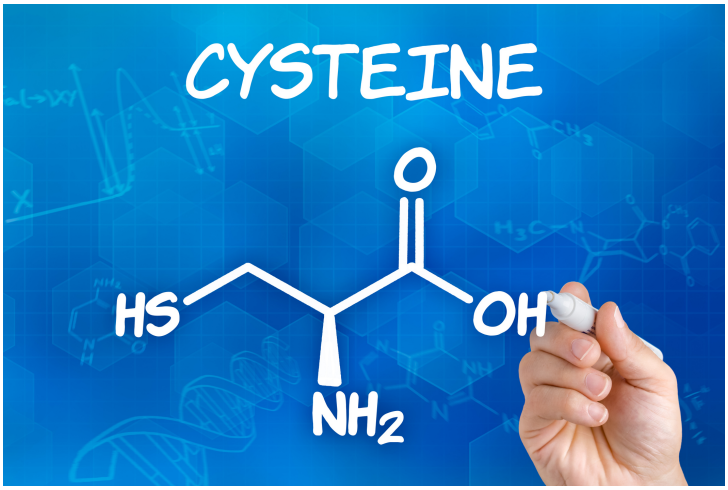
INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Enhancement of Cysteine Production and Reduction of Biofilm Formation in Escherichia Coli

TECHNOLOGY NUMBER: 7295



Technology ID
7295

Category
Chemical Processes and Synthesis
Engineering & Physical Sciences

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OVERVIEW

Enhanced cysteine production via novel genetic modification of Escherichia coli

- Eliminates hazardous waste, enhances yields, and offers non-animal cysteine source
- Applies to dietary supplements, pharmaceuticals, and antibiotics to prevent biofilm formation

BACKGROUND

Cysteine, an amino acid, is often lacking in individuals during infancy, advanced age, or with metabolic diseases, making supplementation necessary. Traditional cysteine purification methods like the hydrolysis of human hair and bird feathers involve extensive use of hydrochloric acid, creating significant hazardous waste and yielding low outputs, especially from bird feathers. Moreover, these methods are unsuitable for those seeking non-animal derived cysteine sources. Existing fermentation technologies utilizing genetically engineered Escherichia coli for cysteine production are more sustainable but still limited in efficiency. Therefore, a need exists for an improved method to efficiently isolate cysteine in a manner that is easily sustained and acceptable to all dietary preferences.

Innovation

Researchers at the University of Michigan have identified a previously unknown gene in Escherichia coli that regulates cysteine synthesis. By deleting this gene, they can significantly enhance cysteine production, making it ideal for industrial use. This method not only boosts yields but also mitigates environmental concerns related to hazardous waste from traditional hydrolysis methods. Additionally, the gene's product could inhibit biofilm formation, presenting a novel approach for developing antibiotics. Potential applications of this innovation include producing cysteine for dietary supplements and pharmaceuticals, and utilizing the gene product in medical treatments to prevent biofilm-associated infections.