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Methods for Degrading the Peptidoglycan Layer of a Bacterial Cell Wall

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Inventors

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Invention Description

Through advances in molecular biology, many bacteria have been genetically engineered to become essentially bioreactors, producing numerous valuable products, such as proteins, chemicals, drugs, and fuels. Most of the products produced typically accumulate inside the bacterial cells. This necessitates degradation of the peptidoglycan layer of the cell wall to release the cellular contents. Traditional cell processing methods can require significant energy inputs or raise environmental issues. Thus, there is a need for facile methods of degrading the bacterial cell wall in a controlled fashion.

Researchers at the Biodesign Institute of Arizona State University have developed a method for degrading the peptidoglycan layer of the cell wall by introducing into the bacterium a nucleic acid which causes synthesis of a protein(s) capable of forming a lesion in the cytoplasmic membrane and peptidoglycan layer. The nucleic acid sequence contains an inducible promoter to control the expression of genes encoding the protein(s). This method provides efficient release of the cytoplasmic contents in a regulated manner.

Potential Applications

- Protein production
- Chemical manufacturing
- Drug production
- Fuel production

Benefits and Advantages

- Access to bacterial components with regulated degradation and controllable timing
- Method does not require high energy input
- Little to no environmental impact
- Cost effective recovery of desired bacterial products

Intellectual Property Status:

Patent Pending

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