Carbon Sequestration Technologies by Escherichia coli containing CBB genes

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Expression of recombinant proteins in Escherichia coli can be disrupted by inclusion bodies (IBs) resulting from imbalances in protein folding, aggregation, and degradation. In this study, we tried to improve the expression of recombinant proteins by inhibiting the formation of IBs in recombinant E. coli by controlling the culture temperature. In E. coli utilized in this study, the Calvin-Benson Bassham gene was introduced to enable photosynthesis, and it showed improved CO_2 fixation through IBs inhibition. The feasibility of this strategy was validated by TEM, GC, HPLC, LC/MS, ATP and NAD/NADH assay, and Bioelectrochemical technique. The utilization of E. coli capable of CO_2 fixation has the potential to be a promising biological solution to solve the greenhouse gas problem in an environmentally friendly way.

This work was supported by Korea Institute of Planning and Evaluation for Technology in Food, Agriculture and Forestry (IPET) through Crop Viruses and Pests Response Industry Technology Development Program, funded by Ministry of Agriculture, Food and Rural Affairs (MAFRA) (321108-04).