

Enhanced GABA production via protein complex of *Pyrococcus horikoshii* glutamate decarboxylase and *Escherichia coli* GABA transporter

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Gamma-aminobutyric acid (GABA) is a precursor to pyrrolidone, a monomer used for the production of a biodegradable polymer known as nylon-4. GABA is also widely used in the medical industry to treat conditions such as high blood pressure, anxiety and depression. Generally, GABA is produced from glutamate by the enzyme glutamate decarboxylase (GadB). In this study, a synthetic scaffold complex was introduced between *Pyrococcus horikoshii* GadB and the GABA antiporter (GadC) from *E. coli*. *P. horikoshii* GadB was attached to the N-terminus, C-terminus and middle of *E. coli* GadC via scaffolding. Among the three scaffold complexes evaluated, the N-terminus scaffold model produced 5.93 g/L of GABA from 10 g/L monosodium glutamate (MSG). When the *gabT* mutant *E. coli* XBT strain was used, the highest GABA concentration of 5.96 g/L was obtained, which is 97.8% of GABA yield. In addition to GABA concentration, GABA productivity was increased 3.5 fold via the synthetic scaffold complex.

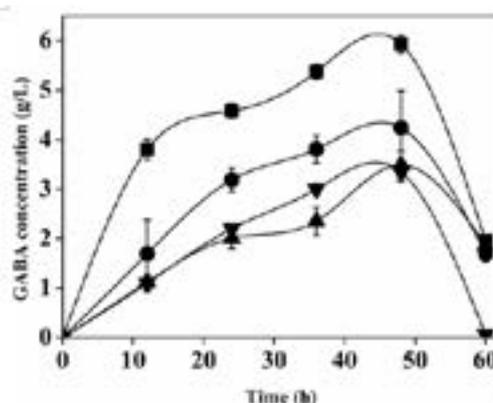


Fig. 1. Time profile of GABA production for 60 h of culture from various scaffold complexes, pH1BP : N-terminus scaffold complex (■), pH2BP : Sandwich scaffold complex (●), pH3BP : C-terminus scaffold complex (▲), pHBP : Without scaffold complex (▼).

Biography

Soong Ho Hong graduated from School of Chemical Engineering & Bioengineering, University of Ulsan, Korea. His major research field involves Metabolic Engineering, In Silico Simulation of Microorganisms, Systems Biology, Synthetic Biology, and Bioengineering.

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