Zehra Tatli et al., Curr Synthetic Sys Biol 2015, 3:3
http://dx.doi.org/10.4172/2332-0737.C1.003

OMICS International
conferenceseries.com

International Conference on
Synthetic Biology

September 28-29, 2015 Houston, USA

Comparison of intracellular and extracellular cellulase production by recombinant bacterium *Escherichia coli*

Zehra Tatli[1], **Matthew DeLisa**[2] and **Eda Celik**[1,2]
[1]Hacettepe University, Turkey
[2]Cornell University, USA

Low cost, pH and thermo-stable cellulase enzymes are an important factor for commercially viable production of bioethanol which is a renewable source of energy. Nowadays, the cost of cellulase accounts for 40-50% of the total ethanol production cost and it is targeted to be reduced 5-folds for commercial efficiency. Instead of food raw materials such as corn and sugar cane, ethanol obtained from cellulosic biomass by endoglucanase type of cellulase will reduce production costs.In this process, the choice of the host cell is extremely important in order to develop more economical production processes. *Escherichia coli* bacterium is one of the most preferred hosts for the production of recombinant proteins. On the other hand, enzymes produced in bacterial systems are known to be more economical compared to eukaryotic cells provided that they can be secreted in high amounts. In this context, recently codon optimized novel Cel5A enzyme was expressed intracellularly and extracellularly in *E. coli* and bioprocess optimization studies were followed by Western blot and spectrophotometric enzyme activity assays. We increased intracellular enzyme activity 50-fold up to 0.74 IU/mL and extracellular enzyme activity 5-fold up to 1.5 IU/mL. The recombinant cellulase enzyme and the bioprocess developed in this study have vital importance for overcoming the bottlenecks in the biofuels and energy sector.

Biography

Zehra Tatli is a Master of Science student in Bioengineering at Hacettepe University, Turkey and she has Bachelor's of Science degree in Biology.Currently, she is working on her MSc thesis titled "Novel cellulase enzyme production towards biofuels sector by recombinant bacterium *Escherichia coli*" supported by TUBITAK (The Scientific and Technological Research Council of Turkey). She is interested in Synthetic Biology and wants to improve herself further during PhD studies on recombinant protein biogenesis in microorganisms and on the development of platform technologies for protein expression and engineering.

zehratatliy@gmail.com

Notes: