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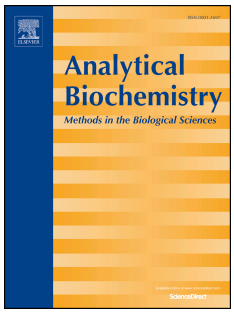

Exploring three different expression systems for recombinant expression of globins: *Escherichia coli*, *Pichia pastoris and Spodoptera frugiperda*

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PII: S0003-2697(17)30493-1

DOI: 10.1016/j.ab.2017.11.027

Reference: YABIO 12858

To appear in: *Analytical Biochemistry*

Received Date: 18 September 2017

Revised Date: 29 November 2017

Accepted Date: 30 November 2017

Please cite this article as: A. Bracke, D. Hoogewijs, S. Dewilde, Exploring three different expression systems for recombinant expression of globins: *Escherichia coli*, *Pichia pastoris and Spodoptera frugiperda*, *Analytical Biochemistry* (2018), doi: 10.1016/j.ab.2017.11.027.

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Exploring three different expression systems for recombinant expression of globins: *Escherichia coli, Pichia pastoris and Spodoptera frugiperda*

Application to human neuroglobin and androglobin

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Highlights

- Three different systems were explored for the recombinant expression of globins
- Neuroglobin was successfully expressed in these three expression systems
- The full length androglobin was stably expressed in *Spodoptera frugiperda*
- Full protein context is necessary for a stably folded globin domain of androglobin

Abstract

Globins are among the best investigated proteins in biological and medical sciences and represent a prime tool for the study of the evolution of genes and the structure-function relationship of proteins. Here, we explore the recombinant expression of globins in three different expression systems: *Escherichia coli*, *Pichia pastoris* and the baculovirus infected *Spodoptera frugiperda*. We expressed two different human globin types in these three expression systems: I) the well-characterized neuroglobin and II) the uncharacterized, circular permutated globin domain of the large chimeric globin androglobin. It is clear from the literature that *E.coli* is the most used expression system for expression and purification of recombinant globins. However, the major disadvantage of *E. coli* is the formation of insoluble aggregates. We experienced that, for more complex multi-domain globins, like the chimeric globin androglobin, it is recommended to switch to a higher eukaryotic expression system.

Key words: globin, protein expression, androglobin, neuroglobin

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