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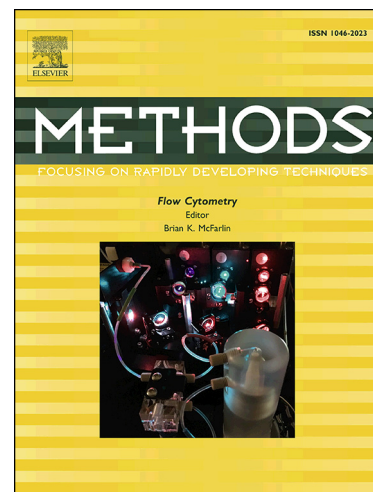
Expression of recombinant proteins in insect and mammalian cells

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Title – Expression of recombinant proteins in insect and mammalian cells

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Highlights

- Higher eukaryotic expression systems are often the preferred choice for complex proteins requiring post translational modification including folding.
- The most frequently used systems are baculovirus infected insect cells and HEK or CHO mammalian cells.
- Despite their obvious advantage over microbial hosts there are often still problematic proteins that require significant effort to overcome the difficulties.
- Membrane proteins perhaps represent the greatest challenge but significant progress has been made to devise methods to express, purify and then use these membrane proteins to facilitate structural biology and approaches to discover new therapeutic agents.

Abstract

Purified recombinant proteins are key reagents in academic and industrial research. The ability to make these proteins quickly often relies on the availability of higher eukaryotic cell hosts such as insect and mammalian cells where there is a very wide range of post-translational modifications, protein folding and trafficking pathways. This enables the generation of many proteins that cannot be made in microbial hosts. In this article we outline some of the most commonly used methods to express recombinant proteins in insect and mammalian cells.

General Introduction

Recombinant protein technologies underpin not only much research but also the manufacture of biological drugs. The focus of this review is on the provision of protein reagents when generally only small quantities are required (tens of micrograms to a few hundred milligrams). However laboratories that undertake this type of work will frequently need to produce many different types of protein and in a timescale measured in weeks.

The first choice to express any protein if it can be achieved would always be a microbial host in particular *E.coli* as the cells are easy, fast and cheap to culture. However post translational modifications are very limited and many proteins are expressed in an insoluble, unfolded form even when a variety of different approaches are investigated such as alternative strains, reduced temperature and co-expression of chaperones. As a consequence, higher eukaryotic hosts are frequently used, the two most common being baculovirus infected insect cells and various different mammalian cell hosts, most commonly CHO and HEK cells. A further key

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