Rapid, simple and high yield production of recombinant proteins in mammalian cells using a versatile episomal system

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Auteur	Magistrelli, Giovanni [1], Malinge, Pauline [2], Lissilaa, Rami [3], Fagète, Séverine [4], Guilhot, Florence [5], Moine, Valéry [6], Buatois, Vanessa [7], Delneste, Yves [8], Kellenberger, Stephan [9], Gueneau, Franck [10], Ravn, Ulla [11], Kosco-Vilbois, Marie [12], Fischer, Nicolas [13]
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Résumé en anglais	Many research projects in life sciences require purified biologically active recombinant protein. In addition, different formats of a given protein may be needed at different steps of experimental studies. Thus, the number of protein variants to be expressed and purified in short periods of time can expand very quickly. We have therefore developed a rapid and flexible expression system based on described episomal vector replication to generate semi-stable cell pools that secrete recombinant proteins. We cultured these pools in serum-containing medium to avoid time-consuming adaptation of cells to serum-free conditions, maintain cell viability and reuse the cultures for multiple rounds of protein production. As such, an efficient single step affinity process to purify recombinant proteins from serum-containing medium was optimized. Furthermore, a series of multi-cistronic vectors were designed to enable simultaneous expression of proteins and their biotinylation in vivo as well as fast selection of protein-expressing cell pools. Combining these improved procedures and innovative steps, exemplified with seven cytokines and cytokine receptors, we were able to produce biologically active recombinant endotoxin free protein at the milligram scale in 4–6 weeks from molecular cloning to protein purification.
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