 Copyright© 2008 Polskie Towarzystwo Parazytologiczne

The use of recombinant proteins in diagnostic parasitology: possibilities and challenges

Jens G. Mattsson

Department of Virology, Immunobiology and Parasitology, National Veterinary Institute, SE-751 89 Uppsala, Sweden

In this communication I will address the use of recombinant proteins in parasitology. The focus will primarily be on diagnostic applications and I will give examples from our work with the Apicomplexan parasite *Neospora caninum* and the parasitic mite *Sarcoptes scabiei*, respectively. The first, and an absolutely crucial, step is the selection of protein or antigens that later can be used in a serological assay. Strategies that have been employed for that purpose include various types of immunoscreening protocols, proteomics and genomics. Sometimes this selection can also include more functional or more biological data. Once candidate genes have been identified, several important challenges remain, including cloning, production, purification, validation and test design. The protein has to be produced in a heterologous system or host that can be grown under defined laboratory conditions. For most purposes the Gram-negative bacterium *Escherichia coli* is the obvious choice although other alternatives can also be used. For *E. coli* the number of possible options in terms of strains, vectors and culture conditions are more than plentiful and I will present some of our experiences selecting robust and reliable strategies. The down-stream processing i.e. purification of 'active' proteins can be very complex, and often the design of the cloning step has to take that into consideration as well. Next, the validation of candidate recombinant proteins has to be done before the formulation of a diagnostic assay as such can take place. Whatever antigen or antigen combination that will be chosen for the assay, new hurdles will most certainly be identified during the final design of a functional assay.