Obtaining and characterization of SPA–β-Lactamase fusion protein

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Staphylococcus aureus protein A (SPA) is well known for its capacity to interact with Fc-fragments of IgG. Thus it's widely used for capture and purification of antibodies and Fc-fusion proteins, for separation of the blood of patients with autoimmune diseases from autoantibodies and circulating immune complexes. Our research was aimed to obtain fusion protein SPA–β-Lac for its application in immunoassays as a secondary immunoreagent. Recombinant DNA technology assures the elaboration of genetic constructions without disadvantages of chemical conjugation, such as high heterogeneity of the final product or necessity of separating full-size conjugates from non-conjugated components. β-Lactamase was selected due to its advantages, such as stability and the possibility of obtaining high concentrations in bacterial systems of expression in soluble active form. Besides, genetically fused with the IgG-binding protein (SPA), it allows quantitative and qualitative antibodies detection. The DNA sequence of *E. coli* β-lactamase was subcloned into plasmid vector *pET24-SPA*. *E. coli* BL21(DE3) cells were transformed by obtained plasmid vectors. SPA–β-Lac expression was induced by adding IPTG and also by the autoinduction protocol. The protein of interest was accumulated in the cytoplasmic fraction of *E. coli*. The functional activity of SPA–β-Lac was confirmed with ELISA. The possibility of longterm storage of the protein at -20°C without loss of its functional activity was shown. Application of SPA–β-Lac as a universal secondary immunoreagent allows to extend the range of primary antibodies for antigen detection in ELISA or blot analysis (SPA detects Fc-fragments of IgG of different animal species and human IgG).