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Implementation of ssDNA aptamers for imidazole-free purification of His₃-tagged recombinant proteins

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The dynamic development of genetic engineering has opened new perspectives for the production of recombinant proteins which are currently offered by many biotech companies. In addition to the medical and industrial applications they are also extensively used in basic research studies. Recombinant proteins are often produced in heterologous expression systems, for example in *E. coli* cells. Before proteins find a final application, purification, a key stage of the production process, must be performed. Therefore affinity chromatography systems were developed for the fast and simple isolation of recombinant proteins. One of such systems is Immobilized Metal Ion Affinity Chromatography (IMAC), which is commonly used for the purification of His₆-tagged recombinant proteins. Although it is a powerful system it is not free of disadvantages. Recently an alternative solution, which is free of IMAC drawbacks, was developed. It is based on a unique ssDNA sequence, called the H₃T aptamer, which was selected for the purification of His₃-tagged recombinant proteins. The binding of the H₃T aptamer to His₃-tag is controlled by sodium ion concentration. Based on this feature H₃T aptamer resins can be successfully employed for the purification of His₃-tagged recombinant proteins from *E. coli* total protein extracts using imidazole-free buffers. The purity of His₃-tagged proteins is superior when purified with the help of the H₃T aptamer in comparison with IMAC resins.

Biography

Wojciech Strzalka has completed his PhD at the Jagiellonian University. He completed Post-doc at Salento University, Italy and Osaka University, Japan. Currently, he is a Group Leader at the Faculty of Biochemistry, Biophysics and Biotechnology, Jagiellonian University. He is studying mechanisms of plant DNA replication and repair, as well as working on the development of new affinity chromatography systems for the purification of recombinant proteins.

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