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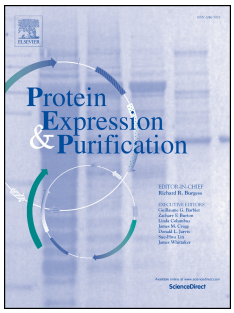

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Biotechnological applications of Elastin-like polypeptides and the inverse transition cycle in the pharmaceutical industry

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ABSTRACT: Proteins are essential throughout the biological and biomedical sciences and the purification strategies of proteins of interest have advanced over centuries. Elastin-like polypeptides (ELPs) are compound polymers that have recently been highlighted for their sharp and reversible phase transition property when heated above their lower critical solution temperature (LCST). ELPs preserve this behavior when fused to a protein, and as a result providing a simple method to isolate a recombinant ELP fusion protein from cell contaminants by taking the solution through the soluble and insoluble phase of the ELP fusion protein, a technique designated as the inverse transition cycle (ITC). ITC is considered an inexpensive and efficient way of purifying recombinant ELP fusion proteins. In addition, ELPs render recombinant fusion protein more stability and a longer clear time in blood stream, which give ELPs a lot of valuable applications in the biotechnological and pharmaceutical industry. This article reviews the modernizations of ELPs and briefly highlights on the possible use of technologies such as the automatic piston discharge (APD) centrifuges to improve the efficiency of the ITC in the pharmaceutical industry to obtain benefits.

Keywords: Elastin-like polypeptides; inverse transition cycle; protein purification; protein fusion; lower critical solution temperature.

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