A PEGylation Technology of L-Asparaginase with Monomethoxy Polyethylene Glycol-Propionaldehyde

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Polyethylene glycol (PEG) conjugation technology has been successfully applied to improve the performance of protein drugs. In this study, L-asparaginase was N-terminal site-specifically modified by alkylating PEG with monomethoxy polyethylene glycol-propionaldehyde (mPEG-ALD₂₀₀₀). The optimum reaction parameters were determined as pH 5.0, a molar ratio of mPEG-ALD₂₀₀₀ to L-asparaginase of 10:1, a reaction time of 16 h and temperature of 25 °C. PEG-L-asparaginase (PEG-L-ASNase) was isolated and purified with consecutive anion-exchange (XK, 16 × 20 cm, Q Sepharose FF) and gel-filtration (Tricorn, 10 × 600 cm, Sephacryl S-300 HR) chromatography, respectively. PEG-L-ASNase retained 43.5% of its activity and the N-terminal amino groups were modified to an extent of 3.67%.

Key words: PEGylation, L-Asparaginase, Purification