Comparison of Immobilized Metal Affinity Chromatography Ni-NTA and Co-TALON for the Purification of Recombinant Human Erythropoietin

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The purification of recombinant proteins is an important stage in biopharmaceutical research. A commonly used technique is immobilized metal affinity chromatography (IMAC). One of the main advantages of this type of chromatography is that the column can easily be regenerated for subsequent purification work. The mechanism of IMAC is based on bonding between metal ions immobilized on a matrix with a specific amino acid. Because of the strong interactions of the electron donor group on the imidazole ring, histidine is often used in the IMAC purification system. Two types of commercial IMAC resin use a nitrilotriacetic acid (NTA) matrix: a nickel-based (Ni-NTA) and cobalt-based (Co-NTA), better known as TALON. This study was aim to investigate the effect of the metal ions Ni2+ and Co2+ to purify recombinant human erythropoietin (rhEPO) expressed in yeast system Pichia pastoris. The results indicated that both Ni-NTA and Co-TALON gave almost the same level of protein purity; however, Ni-NTA has a higher binding affinity than Co-TALON might be due to the higher stability complex of Ni+. The average amount of protein bound by Ni-NTA and Co-TALON was 183.5 and 38.7 μg/mL, respectively.