

ภาคผนวก (Appendix I)

บทคัดย่อการนำเสนอผลงานนเรศวรวิจัยวันที่ 29-30 ก.ค. 2554

Abstract

Factor affecting the metal binding affinity of heavy metal binding domain

(CxxC motif) recombinant protein : a potential for bioremediation

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Bioremediation is a biological method for removing heavy metals from the environment. Heavy metal binding proteins have been identified in various organisms and have been used to study for bioremediation. CxxC motif is a metal binding domain that found in all living organisms. In this study, we determined the factors involving metal binding activity of the metal binding domain (CxxC motif) recombinant protein in order to analyze the potential of the recombinant protein for bioremediation. The protein contain metal binding domain (CxxC motif) from *mcsa* gene of *S. aureus* was cloned, expressed and purified. Recombinant protein was tested for metal binding using IAA resin chromatography. The

recombinant protein can bound to CdCl_2 , CoCl_2 , CuCl_2 and ZnCl_2 . The expression of metal binding proteins that can bind to CdCl_2 , CoCl_2 , CuCl_2 and ZnCl_2 from the total proteins of *E. coli* (BLR(DE3)) are 3.86, 3.3, 3.53 and 4.63%, respectively. Thermal stability of the recombinant protein was tested at 37 °C, 45 °C, 65 °C for 10 minutes and the results shown that the metal binding activity still present after 65 °C treatment. Temperature that affects the metal binding activity was tested and the results showed that recombinant protein were still bound to CuCl_2 at 65 °C. In conclusion, the results from our study shown that metal binding domain (CxxC motif) recombinant protein can bind effectively to various types of heavy metals and may be used as a potential tool for bioremediation.



