

## The yief protein application and its performance improvement in bioremediation

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**Abstract:** Heavy metal pollution is an important environmental problem that affects the life of plants, animals and especially, mankind [1]. Many enzymes from bacteria, fungi, and plants are used in biodegradation of toxic organic pollutants especially heavy metals [2]. Bioremediation is a technology which uses the microbial and other natural enzymes for biodegradation of toxic compounds in wastewater and polluted soil [3]. Bioremediation projects could be more effective if the catalytic mechanism of the enzyme is considered that many factors including pH, temperature, co-enzymes effects on enzyme catalytic activity [4]. Using of the bioinformatics resources can develop the efficiency of bioremediation by improving of enzymes activity [5]. Cr(VI) (chromate) is one of the toxic heavy metals that is soluble in water and can easily pollute the environment. There is some enzyme in bacteria that can reduce chromate to the insoluble and less toxic Cr(III), thus chromate reductase is one of more important enzymes in bioremediation that can remove Cr from polluted water or soil [6,7]. Uses of some microorganism and their enzymes to remove toxic pollutants has been reviewed [8]. The Chromate reductase enzyme has been found in the cell membrane or in the cytoplasm of many bacteria that can use it to remove of toxic chromate [9]. One of this chromate reductase enzymes called yief protein that is found in many bacteria [10]. In this study, we selected the *Enterobacter cloacae* EcWSU1 microorganism to evaluate the yief protein and the applicable methods for solving problems and improving performance of the enzyme activity. We are remodeling this protein for better efficiency.

**Keywords:** Bioremediation; chromate reductase; bioinformatics sources; Remodeling

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