

ABSTRACT

The effect of light on the activity of phenylalanine aminomutase was determined by measuring the expression and activity of the recombinantly expressed enzyme in *E. coli*. The variation of phenylalanine aminomutase activity over time in response to light and the effect on cell viability was also determined. The type of radiation responsible for phenylalanine aminomutase activation was determined by irradiating the cell cultures with blue light. Phenylalanine ammonia lyase has been shown to increase in activity when exposed to light in whole organisms. No similar studies have been carried out with heterologously expressed recombinant protein. Phenylalanine ammonia lyase is mechanistically similar to phenylalanine aminomutase and would be expected to behave similarly. The aim of this study was to demonstrate whether light can increase the activity and expression of phenylalanine aminomutase. The results show that phenylalanine aminomutase from cells exposed to white light had a more than fourfold increase in activity compared to cells kept in the dark. The time course assay of the activity show that the change in activity is cyclic and over a long period of incubation there seem to be no major difference between light and dark. Total white increases the growth rate of *E. coli*. compared to cultures kept in the dark or where the infrared light had been cut off. This study will provide an easy and inexpensive way of producing more efficient enzymes per gram of cell pellet without increasing the culture volumes.