Abstract

Proteins from hyperthermophilic organisms are mainly studied for their extraordinary structural stability and applicability in industrial processes carried out at extreme temperatures. Moreover cloning and expressing such proteins in mesophilic organisms such as E. coli does not change their properties, making it easy to study, engineer and understand them. In the present study, we have worked upon five such thermostable proteins viz DNA polymerase, Argininosuccinate lyase, and Beta glucosidase from Pyrococcus furiosus and Peptidase M50, and Protease Do from Thermotoga maritima. Our aim was to clone these genes, express, purify and do a complete biophysical characterization of these proteins. In order to understand the structure and function relationship in the above mentioned proteins, tools like circular dichroism, fluorescence spectroscopy, dynamic light scattering were used as well as denaturation (thermal and chemical) studies were carried out. Since some proteins (DNA polymerase, Beta glucosidase) have industrial importance, such studies are beneficial for achieving scientific insights, as well as exploitation of their commercial potential. The study also provides useful leads for further probing into properties and activities of these proteins.