

Comparative study of thermostability and structure of close homologues - bamase and binase

Makarov A., Protasevich I., Kuznetsova N., Fedorov B., Korolev S., Struminskaya N., Bazhulina N., Leshchinskaya I., Hartley R., Kirpichnikov M., Yakovlev G., Esipova N.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Parameters of heat denaturation and intrinsic fluorescence of bamase and its close homologue, binase in the pH region 2-6 have been determined. The bamase heat denaturation (pH 2.85.5) proceeds according to the "all-or-none" principle. Bamase denaturation temperature is lower than that of binase and this difference increases from 2.5 °C at pH 5 to 7 °C at pH 3. Enthalpy values of bamase and binase denaturation coincide only at pH 4.5-5.5, but as far as pH decreases the bamase denaturation enthalpy decreases significantly and in this respect it differs from binase. The fluorescence and CD techniques do not reveal any distinctions in the local environment of aromatic residues in the two proteins, and the obtained difference in the parameters of intrinsic fluorescence is due to fluorescence quenching of the bamase Trp94 by the His 18 residue, absent in binase. Secondary structures of both native and denaturated proteins also do not differ. Some differences in the bamase and binase electrostatic characteristics, revealed in the character of the dipole moments distribution, have been found.
© 1993 Taylor & Francis Ltd.

<http://dx.doi.org/10.1080/07391102.1993.10508695>
