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Title of the thesis: Effect of Sequence Differences between Cytochromes-C from Buffalo and Horse on the Protein Folding ↔ Unfolding Pathway

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Abstract

The denaturation of cyt-*c* has been attracting the interests of protein scientists for long time. The scientists have used various techniques and chemicals to study the denaturation and most importantly the presence of different intermediate states on the protein folding ↔ unfolding pathway. Many ionic surfactants lead to the denaturation of proteins. Surfactants provide fascinating chemistry as they are available in various charged forms and with varying degrees of hydrophobicity to explore the role of electrostatic and hydrophobic interactions with the protein structure. We have tried t o explore the effect of sequence variation on the protein folding ↔ unfolding pathway by utilizing b-cyt-*c*, h-cyt-*c* etc and the various surfactants like SOS, SDS and STS. The techniques used in this study are circular dichroism, fluorescence spectroscopy and dynamic light scattering etc. The findings from this study are:

(i) surfactants like SDS and STS lead to stabilization of b-cyt-*c* and h-cyt-*c* at low concentration, (ii) the stabilization property of the surfactants to b-cyt-*c* and h-cyt-*c* depends both on the anionic character as well as on the hydrophobicity of the surfactants, (iii) the denaturation of b-cyt-*c* and h-cyt-*c* in presence of surfactants like SDS, SOS and STS follows a multiphasic transition, (iv) the different intermediate states found on the protein folding ↔ pathway also depends on the sequence of the amino acids, and (v) the denaturation of b-cyt-*c* in presence of GdmCl is a two state-process.