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**Thermal fluctuation spectroscopy in histone and nucleosomes during denaturation** ARUP RAYCHAUDHURI, S.N.Bose National Centre for Basic Sciences, K.S. NAGAPRIYA, Indian Institute of Science — Thermal stability of biomolecules is an important issue. We have studied thermal denaturation of histone and nucleosome using precision thermal fluctuation spectroscopy (TFS) . - a problem that we believe has not been studied experimentally before. TFS uses a very sensitive noise calorimeter which can detect thermal fluctuations of micro Kelvin at around room temperature. We find that the thermal denaturation of histones (in particular H1) as well as that of the nucleosome are associated with large fluctuations, which are few orders higher than those away from the denaturation temperature. It involves large energy exchange which can be few tens of  $k_B T_0$  ( $T_0=300K$ ). It appears that the denaturation occurs in three distinct steps 1. breaking of bonds leading to the cooling jumps, 2. the change in its secondary, tertiary structure leading to slow dynamics and 3. formation of bonds as it is unfolding and in the newly folded high temperature phase which accounts for the heating jumps.

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