PICOSECOND RELAXATION DYNAMICS OF A TEMPERATURE DEPENDENT AMIDE I BAND IN MYOGLOBIN

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We will discuss the infrared absorption spectra of myoglobin and show that it has has a strong temperature dependence and that the relaxation dynamics of the amide I band is strongly dependent on both temperature and wavelength. We show using picosecond pump-probe measurements that a band at 6.17 microns which is strongly temperature dependent has dramatically different relaxation dynamics than the conventional 6.0 microns amide I band, exhibiting an extraordinarily long lifetime and quantum beating phenomena. This state could act as a transient storage of vibrational energy at physiological temperatures in biomolecules and help to direct the path of energy flow in a biomolecule under biological conditions.