

Abstract Submitted  
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**Low frequency dynamics of Cytochrome c** KARUNAKARAN VENUGOPAL, PAUL CHAMPION, Department of Physics and Center for Interdisciplinary Research on Complex System, Northeastern University, Boston — Femtosecond coherence spectroscopy is used to investigate the low frequency dynamics of cytochrome c (cyt c). There is good agreement between the higher frequency oscillatory components of the coherence spectra and the low frequency Raman spectra. A mode near  $\sim 40 \text{ cm}^{-1}$  is a universal feature of heme systems and has been assigned to doming motions that are strongly enhanced upon ligand photolysis [1]. A dominant heme ruffling mode near  $\sim 60 \text{ cm}^{-1}$  [2] appears in ferric cyt c for excitation in the region 425-432nm, to the red of the Soret maximum (408nm). This, along with a phase jump of  $\sim \pi$  in this region, suggests the ruffling mode is coupled to a charge transfer (CT) band underlying the Soret band [3] and that it is a potentially important electron transfer reaction coordinate. [1] F. Gruia, M. Kubo, X. Ye, P. M. Champion, *Biophys. J.*, **2008**, 94, 2252. [2] M. Kubo, F. Gruia, A. Benabbas, A. Barabanschikov, W. R. Montfort, E. M. Maes, P. M. Champion, *J. Am. Chem. Soc.*, **2008**, 130, 9800. [3] K. T. Schomacker, P. M. Champion, *J. Chem. Phys.*, **1986**, 84, 5314.

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