WATHCING THE PROTEIN MAMBO: FAST ENZYME DYNAMICS

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The structural dynamics of enzymes at the femtosecond to picosecond time scale have been invoked to explain the results of temperature-dependent kinetic-isotope-effect measurements for a number of enzymatic reactions. We report studies of enzyme-ligand interaction dynamics at this time scale. We report studies of enzyme dynamics in complexes of formate dehydrogenase including transition-state-analog complexes and identify distinct and unexpected dynamics associated with the transition-state structure. Our results support a potential role for fast dynamics near the transition state and reveal differences in the nature of enzyme-ligand interaction dynamics in the ground state and in vicinity of the transition state of a reaction.