Abstract

Myofibrillar creatine kinase (CK) has been studied for activity control due to structural changes of its molecule. Data indicating three CK conformations for three substrate ligation states were collected, using fluorescence and absorption spectroscopy. As the radius of CK molecule under ligation states: CK free, CK-ATP+creatine and CK-ATP complexes decreases, in the same block sequence decrease: fluorescence lifetimes 2.72, 2.42, 2.38 ns of intrinsic tryptophans emission, anisotropy decays, rotation correlation times 35, 29, 27 ns and acrylamide quenching. Data were confirmed by anisotropy experiments with CK-(FITC labelled), providing the correlation times 34, 30, 27 ns. Results indicate that besides the "energy minimizing" conformational effects of substrates, other essential components of physiological control at the subcellular level should be involved in the transition of the CK-ATP+creatine complex from the intermediary (nonreactive) to the closed (reactive) conformation of the molecule.

Keywords: creatine kinase, conformational effect of substrates, enzyme activity control.