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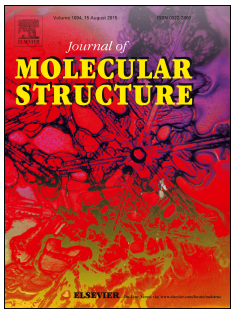

Effect of curcumin on the binding of cationic, anionic and nonionic surfactants with myoglobin

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Effect of curcumin on the binding of cationic, anionic and nonionic surfactants with myoglobin

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Abstract

Interaction of a globular protein, myoglobin and different surfactants has been studied in the absence and presence of curcumin in phosphate buffer at pH =7.4 by UV-VIS spectrophotometry, fluorimetry and fluorescence polarization anisotropy methods. Results show that heme environment of myoglobin is changed by cationic cetyltrimethylammonium bromide (CTAB) and sodium N-dodecanoyl sarcosinate (SDDS). In the presence of myoglobin, CTAB cannot change the heme; but SDDS can make change. Nonionic surfactant N-decanoyl-N-methylglucamine (Mega 10) cannot change the heme environment. Protein is unfolded by the surfactant. Curcumin can prevent the unfolding of protein in the low concentration region of ionic surfactants such as CTAB and SDDS. In nonionic surfactant media, curcumin accelerates the denaturation process. Due to myoglobin-curcumin complex formation, rotational motion of curcumin decreases in surfactant media and so anisotropy increases.

Key words

Interaction, myoglobin, curcumin, surfactants, spectroscopy.

Introduction

Myoglobin is a monomeric heme protein available in muscle tissue. It can act as an intracellular source for oxygen [1]. During lacking of oxygen, the protein supplies it for metabolic process. It is a water soluble globular protein with 153 amino acids, eight alpha helices and a hydrophobic core. Each molecule of myoglobin belongs to one prosthetic group, incorporated into a hydrophobic cleft. One central co-ordinately bound iron (normally, Fe^{2+}) atom is present in heme