PROTECTIVE EFFECT OF PROTEINS ON PHOTODEGRADATION OF FOLIC ACID

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ABSTRACT

Folic acid (FA), a synthetic form of the B group vitamin known as folates, is essential for a variety of physiological processes and plays an important role in the prevention of neural tube defects. However, FA is sensitive to ultraviolet radiation, leading to degradation to form inactive photoproducts. It has been proposed that ligand-binding proteins could be used as potential carriers for the encapsulation and protection of bioactive molecules. By analysis using fluorescence and absorption spectroscopy, it was found that FA could interact equally with β-lactoglobulin (β-LG), bovine serum albumin (BSA) and α-lactalbumin (α-LA). But the proteins could suppress the photo-degradation of FA, which ranked as β-LG > BSA > α-LA. The influence was dependent on the interactions of the proteins with FA and with it photoproducts and of the protein Trp residues with FA photoproducts. The data gathered from these experiments could be useful in the application of ligand-binding proteins as potential carriers for water-soluble active compounds.