

Interactions of phenolic compounds with model lipid membranes and proteins

In vitro, phenolic compounds have been shown to have a broad spectrum of biological effects. The food industry is interested in them particularly, because they are good antioxidants and therefore can prevent oxidation processes and prolong the stability of foods, and also because they can act as antimicrobials. The effects of selected flavonoids and the synthetic antioxidant butylated hydroxytoluene (BHT) on the structural properties of model lipid membranes and bovine serum albumine was investigated using a combination of fluorescence anisotropy measurements, electron paramagnetic resonance (EPR) spectroscopy, and differential scanning calorimetry (DSC). We propose that a structure of a compound determines its behavior in the case of membrane transport and that data based on its polarity, number of H-bonds and topological surface area (TPSA) can predict how a flavonoid can penetrate cell membrane (by passive transport or by a transporter protein).