**Biophysical study on the interaction of model membranes with a nonsteroidal antiinflammatory drug.**

Aloi E. ([1]), Rizzuti B. ([2]), Guzzi R. ([1]), Bartucci R. ([1])

([1]) *Laboratorio di Biofisica Molecolare, Dipartimento di Fisica, Università della Calabria, Arcavacata di Rende, CS*

([2]) *NANOTEC-CNR, Licryl, UOS Cosenza, Arcavacata di Rende, CS e CEMIF.Cal, Dipartimento di Fisica, Università della Calabria, Arcavacata di Rende, CS*

We combined calorimetry, ESR, ATR-FTIR and molecular docking to study the effects of ibuprofen, a nonsteroidal antiinflammatory drug, on DMPC bilayers. Ibuprofen influences the membrane thermotropic phase behaviour, abolishing the pre-transition, decreasing the main-transition temperature and promoting gel-to-fluid phase coexistence. It loosens the packing of DMPC interfacial region in the gel state and leaves unperturbed the chain flexibility in the fluid state. Ibuprofen also leads to a higher polarhead hydration and favours hydrogen bond formation with solvent molecules. The drug adopts different anchoring modes (interaction energy is about -6 kcal/mol) by binding through non-specific interactions at the hydrophilic/hydrophobic membrane interface.