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Interaction of metalloporphyrins with lipid bilayers, a calorimetric study.

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The interaction of three metalloporphyrins, containing manganese, iron and cobalt atoms, with lipid bilayers composed of neutral (DPPC) or charged (DMPG) phospholipids were studied by means of scanning differential calorimetry. We found only minute effects exerted by studied compounds on DPPC, while phase transitions of charged DMPG were seriously affected by porphyrins. Analysis of experimental data revealed that due to the electrostatic interactions DMPG bilayers are perturbed not only in the polar head group region. Putative rearrangements of the polar heads packing affects also the acyl chain region of this lipid bilayer. Perturbation of DMPG polar heads induced by porphyrin in complex with manganese atoms is bigger than that induced by other porphyrins.