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Effect of chlorinated phenols on the structure of model membranes

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The toxic molecules originated from the environment drastically effect the mean functions of the organic cell-membranes. Among the toxic molecules, chlorinated phenols are in the focus of our investigations. Our aim is to follow the changes in the membrane structures of the cell-wall. To study the effects of toxic molecules on the function and the structure of membranes, model systems were used instead of the complex membranes.

In the first part of the research work liposomes (multilamellar vesicles, MLV) were used as a model membrane-system. Dipalmitoylphosphatidylcholine (DPPC) was dispersed in pure water and in 2,4-dichlorophenol (DCP) solutions. The effect of the concentration of DCP on the thermotropic behaviours of the liposome system was studied by four different methods (freeze-fracture, differential scanning calorimetry, small angle X-ray scattering, fluorescence spectroscopy).

Drastic changes of the lamellar structures and the phase-transition behaviours can be observed depending on the ratio between the DPPC:DCP molecules. The small quantity of DCP induces a more ordered structures than that of the pure water/lipid system, while the higher concentration causes a destruction in the lamellar arrangement and a cubic structure appears.