Modified oligonucleotides, short pieces of nucleic acids, have become potential candidates for treatment of viral, malignant or genetic diseases. Efficient application of modified oligonucleotides requires their sufficient penetration inside the cell through the lipid membrane. Diploma thesis employs liposomes, synthetic vesicles formed by the lipid bilayer, as a model system for the study of interaction of lipid and complex of homooligonucleotides dT15 with cationic porphyrin CuTMPyP4 using Raman spectroscopy. Raman spectra were measured in solution on the slide and using special technique of drop coating deposition Raman spectroscopy (DCDR) on integrated Raman confocal microspectrophotometer. Processes of liposome formation and sample preparation were optimized. Experimental data were analysed using factor analysis based on singular value decomposition (SVD) algorithm. It was observed that interaction of oligonucleotide with porphyrin induces fluorescent background increase. Raman spectra of complex of oligonucleotide with porphyrin exhibit the domination of porphyrin vibrational bands. Stretching vibrations of lipid assigned to hydrogens of fatty acids are observed in the spectra of complex with liposomes. The observed spectral changes show the interaction of lipid with complex of oligonucleotide and cationic porphyrin.