Synopsis of Original Research Paper

Development of Novel Amphiphilic Compounds with Multiple Hydrophilic Groups Forming Artificial Photoresponsive Vesicles

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In order to develop novel type of artificial vesicles which can regulate the release ability of entrapped substances by light, four cinnamic acid-derived amphiphiles 1-4 were prepared, and their photoreactivity and aggregation behavior in the solution, the aqueous dispersion, and the DPPC (L- α -dipalmitoylphosphatidylcholine) bilayer matrix were examined. Although 4-hexadecyloxycinnamic acid (3) was converted to the syn head to head dimer in the DPPC bilayer matrix by irradiation at above 280 nm light with formation of cis isomer, the corresponding 3-bromo-4-hexadecyloxycinnamic acid (4) dimerized without formation of the cis isomer. The release of entrapped glucose from the vesicle composed of a 1:1 mixture of cinnamic acid-derived amphiphile 1 (or 2) and DPPC was suppressed by irradiation at above 280 nm light and the extent of suppression was much larger in the case of **2**. The formation of cis isomer accelerated the leakage of the entrapped glucose. In addition, the release of entrapped glucose from the vesicle containing 2 was accelerated by irradiation at 254 nm, which can convert the dimer to the monomer.