Novel amphiphilic compounds for construction of stimulus-sensitive liposomal containers

P.N. Veremeeva, V.L. Lapteva, V. A. Palyulin, I.V. Grishina, A. A. Yaroslavov and N. S. Zefirov

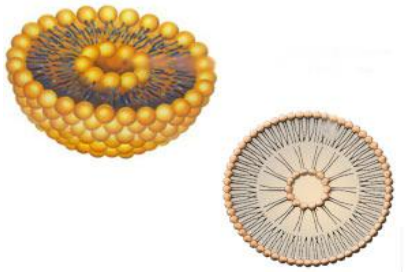
Department of Chemistry, Lomonosov Moscow State University, Leninskie gory, 1/3, Moscow 119991, Russia

alimeriya@yandex.ru

The development of methods for the directed transport of physiologically active compounds to target cells and organs is one of the key problems in modern pharmacology [1]. Liposomes, spherical lipid bilayer vesicles are widely used for the controllable encapsulation and release of drugs.

In this work we describe the synthesis of lipid-like amphiphilic compounds, capable to be incorporated into a liposomal membrane, and their ability to be conformationally reorganized in the following conditions: (1) the pH change, (2) the addition of the water solution of bivalent copper salt [2] and cause the release of compounds encapsulated in the internal volume.

The molecular switchers were designed on the basis of 3,7-diazabicyclo[3.3.1]nonan-9-one (bispidone) with two long alkyl substituents at nitrogen atoms. Bispidone derivatives of this kind in the absence of significant steric hindrance caused by other substituents adopt a chair-boat conformation in neutral or weak-alkaline media while a chair-chair conformation with different orientation of substituents is preferable in the acidic media or after complexation with bivalent metal cations [3].



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