Modular Synthesis of Dendritic Amphiphiles.

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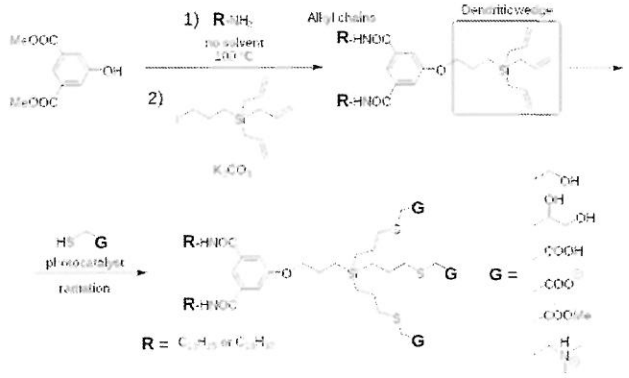
Among nanovesicle drug delivery systems, liposomes are the oldest and most widely used drug carriers.[1] To overcome some of their drawbacks (e.g. low stability), analogical supramolecular systems based on different building blocks were developed in two recent decades. An important class of such new drug delivery systems are dendrimersomes.[2] Dendrimersomes are nanovesicles self-assembled from amphiphilic molecules consisting of at least one dendritic (branched) part. Inspired by their promising properties, this project aims at preparation of a novel type of dendritic amphiphiles for a new series of dendrimersomes. Thanks to the modular concept of the synthesis of the presented compounds, their structure can be readily modified to meet the demands of their applications.

The synthesis of such structures starts by an attachment of alkyl chain/s "**R**" and dendritic wedge/s to the starting molecules (Scheme 1). These dendritic wedges are ended by three allyl groups so that various polar groups can be conjugated to the periphery of the wedge by so called thiol-ene click reaction. In addition to the resulting symmetrical structures, a synthesis of their unsymmetrical analogues bearing fluorescent tag on one of its arms (Figure 1) will be presented.



Scheme 1: Example of preparation of the presented dendritic amphiphiles

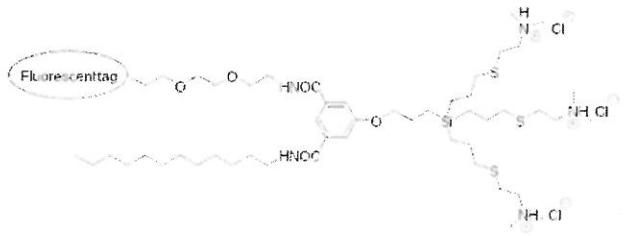


Figure 1: Example of an unsymmetrical analogue of the presented amphiphiles

References

1. Pattni, B. S.; Chupin, V. V.; Torchilin, V. P. New Developments in Liposomal Drug Delivery. *Chem. Rev.* **2015**, *115*, 10938.
2. Dhiraj, S. R.; Rahul, S. K.; Thirumala, G. An emerging class of amphiphilic dendrimers for pharmaceutical and biomedical applications: Janus amphiphilic dendrimers. *Eur. J. Pharm. Sci.* **2017**, *97*, 113–134.