

# DESIGNER AMPHIPHILES – TOWARD LYOTROPIC LIQUID CRYSTAL SYSTEMS FOR ORGANIC SYNTHESIS

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Recently, in the effort to make synthesis on industrial scale greener and less polluting, solvent choices have been tightened with water as one of the most prominent solvents, which still has many limitations<sup>1,2</sup>. Micellar systems are a promising solution to the limitations of water as a medium for organic synthesis, specifically, organic assemblies designed with a non-polar, non-aqueous interior. As promising as micelles are for organic synthesis, they have their own limitations. On the low end of concentration spectrum, there is a critical micellar concentration, under which micelles can not be formed, and on the high end, micellar systems either precipitate out of the solution, or form lyotropic liquid crystalline phases (LLC). LLC concentration range in the field of catalysis has been completely overlooked so far due to the increasing complexity of the system<sup>3</sup>, but in our eyes, it is a field that promises lot and is worth to research further.

This research focuses on designing an amphiphilic molecule (Figure 1a), which will assemble in aqueous media forming nanotubules (Figure 1b)<sup>4</sup>. Furthermore, the design will enable the formation of LLC phases in high concentration range. A series of amphiphilic compounds has been synthesised and their characterization is in process. Most of them are showing supramolecular organisation, and some of them were proven to form micelles. Newly synthesised compounds are showing lyotropic LC phases, which are yet to be fully characterized. After complete analysis of these systems, development of their application for specific organic reactions in water is the next step forward.

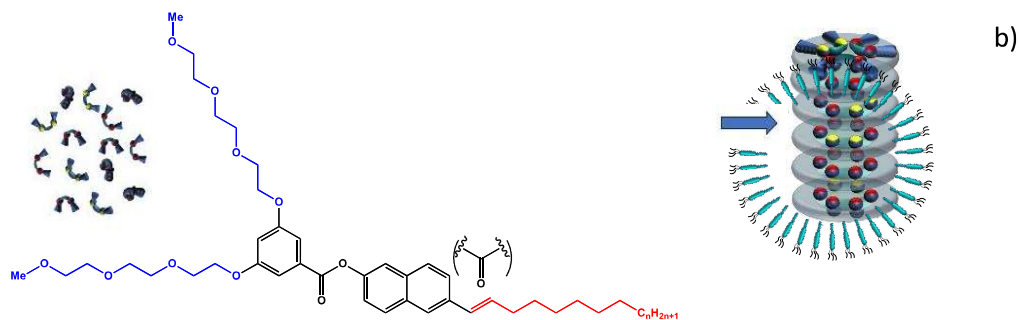


Figure 1. a) general amphiphile structure; b) supramolecular organization of amphiphiles

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