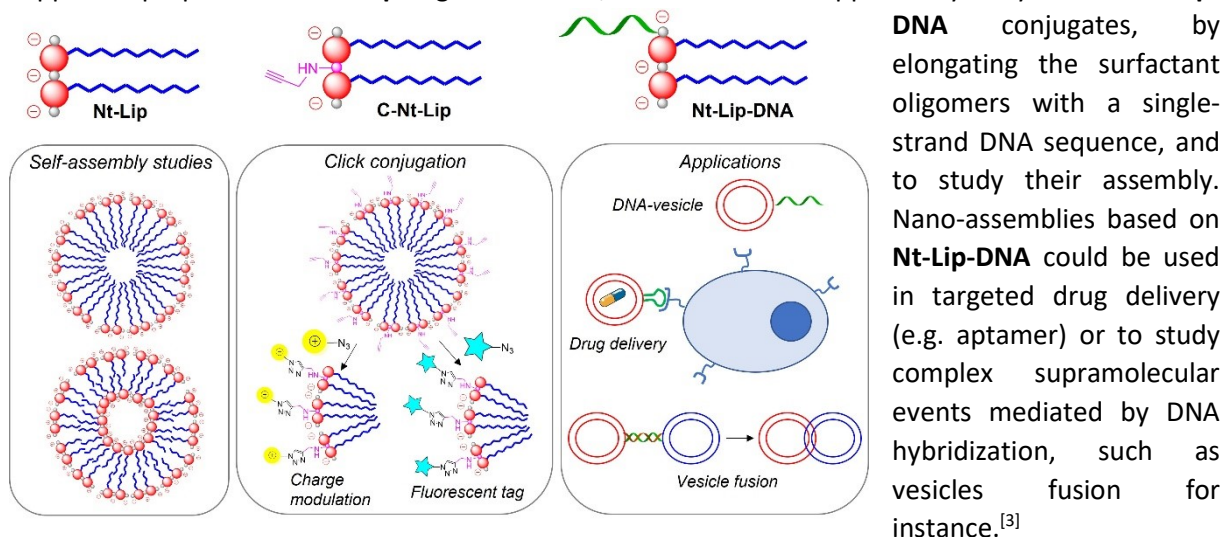


# Nucleotide-like lipid oligomer surfactants: study of self-assemblies and DNA conjugates

Dr. Valerie Sartor, Dr. Guillaume Despras and Prof. Nadia Chouini-Lalanne

Gemini surfactants have attracted considerable interest in last three decades thanks to their superior properties compared to the conventional surfactant: generally lower critical micelle concentration (CMC) and Krafft temperature, higher solubilization power, better efficiency in lowering surface tension and superior wetting and foaming properties.<sup>[1]</sup> Gemini surfactants can be classified by the charge of their hydrophilic headgroups (cationic, anionic, nonionic and zwitterionic) and by the symmetry (homogemini) or dissymmetry (heterogemini) of their structure. Cationic compounds are the most extensively investigated due to their easier chemical access and their larger application fields. Data for anionic dimer surfactants are however scarcer.

The aim of the project is to develop new anionic gemini surfactants based on oligonucleotide backbone<sup>[2]</sup> and to study their self-assemblies. Original linear anionic **Nucleotide-like Lipid (Nt-Lip)** dimers and trimers were designed and will be synthesized by the well-known and very efficient oligonucleotide synthesis pathway. In addition, a conjugatable handle will be installed on one phosphodiester linkage in order to either modulate the charge or to connect a fluorescent reporter, using click chemistry (**C-Nt-Lip**). The use of the phosphoramidite protocol will allow for automated supported preparation of **Nt-Lip** oligomers. Then, it will afford the opportunity to synthesize **Nt-Lip-**



[1] *Adv. Colloid Interface Sci.* **2017**, *248*, 35. [2] *Adv.Mater.* **2018**, *30*, 1705078. [3]a) *Polymers* **2019**, *11*, 1515; b) *J. Am. Chem. Soc.* **2007**, *129*, 9584.

## Applicant's profile:

The applicant must hold a Master degree in chemistry. She/he should have a strong background in organic synthesis, purification and characterization of organic molecules. Skills in physico-chemical characterization methods would be an advantage. The applicant must show motivation for team work. She/he must provide a cover letter, a curriculum vitae and at least one recommendation letter.

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