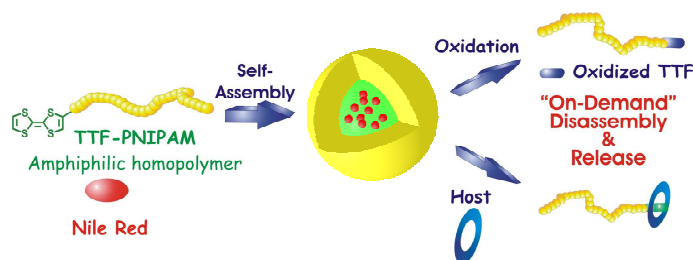


Subject Proposal for Erasmus Students in Chemistry

"Smart micelles"

Micelles fabricated from macromolecular species have attracted considerable interest due to their potential roles in a diverse range of applications including drug delivery and catalysis. These nanosized systems are generally fabricated from amphiphilic block copolymers, which spontaneously form micelles through inter- or intramolecular association upon contact with an aqueous environment.

This proposal for an Erasmus training course deals with the development of new micelle systems able to release "on-demand" drugs or biological compounds using external stimuli (electrochemistry, temperature, supramolecular interactions, ...). In our laboratory, we have developed such "smart" micelles from end-functionalized homopolymer:



Within this framework, the first part of the work will be focused on the synthesis of new functionalized end-functionalized well-defined (co)polymers using different polymerization techniques such as Atom Transfer Radical Polymerization (ATRP) or Reversible Addition-Fragmentation Chain Transfer (RAFT) process. A complete characterization procedure of obtained polymers will be performed (FT-IR, Gel Permeation Chromatography, NMR, Nano-DSC, Nano-ITC...).

The second objective will consist on the self assembly of micelles and their properties in water. In particular, the self-assembly (and disassembly) of polymer-based micelles will be studied using DLS and fluorescence spectroscopy.

Keywords: Synthesis, Polymerization, well-defined polymers, drug release

Contacts: - Patrice Woisel (patrice.woisel@ensc-lille.fr)
 - Zahia Turpin (zahia.turpin@ensc-lille.fr in cc)