

The 144th MANA Special Seminar



Cyclodextrin Vesicles: Supramolecular Chemistry of Dynamic Interfaces

Chair: Dr. Katsuhiko Ariga (MANA Principal Investigator)

Prof. Bart Jan Ravoo

(Organic Chemistry Institute, Münster University, Germany)

This lecture will highlight our latest results on the self-assembly of stimuli-responsive soft materials based on CD vesicles. We have attached carbohydrate molecules to the CD vesicles.³ In this way we obtained an artificial “glycocalix”, similar to the layer of carbohydrates that surrounds nearly every living cell. The carbohydrate coated vesicles interact very specifically with proteins, depending on the nature and density of the carbohydrate on the vesicle surface. We have also attached peptides to the CD vesicles.⁴ Upon a small decrease in pH, the peptide induces a shape transformation of the vesicles into nanofibers and a release of vesicle contents. Peptide-coated vesicles may be useful drug delivery vehicles. Furthermore, we have shown that CD vesicles can bind zwitterionic guest molecules. At neutral pH, the vesicles aggregate and adhere irreversibly. Finally, we have used the photoisomerization of a bifunctional non-covalent linker molecule as a trigger to induce as well as reverse the molecular recognition and adhesion of vesicles. To the best of our knowledge, this supramolecular photo-responsive system is unprecedented.

Venue: Seminar Room #431, MANA Bldg.

Date: May 26th Wednesday Time: 15:30-16:15

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