

Organic Nanoparticles: can they be useful for biological or health issues?

Gilles Clavier #1,² Yasukuni Ryohei #2,³ Pan Miaobo #3,¹ Taufik Indra Rukmana #4,³ Jean-Baptiste Bodin #4,¹ Nicolas Tsapis #5³, Yoichiroh Hosokawa #6,³, Rachel Méallet-Renault #7,¹

¹ *Institut des Sciences Moléculaires d'Orsay, UMR 8214, Fac. Sciences, Univ. Paris-Saclay, Orsay*

² *Laboratoire de Photophysique et Photochimie Supra-et Macro-moléculaires, UMR 8531, ENS-Paris-Saclay, Gif sur Yvette*

³ *Nara Institute of Science and Technology, BioProcess Engineering, Nara, Japan*

⁴ *Institut Galien Paris-Saclay, UMR 8612, Fac. Pharmacy, Univ. Paris-Saclay, Châtenay*

Email: rachel.meallet-renault@universite-paris-saclay.fr

For few years we have been developing organic fluorescent nanoparticles (FNPs) thanks a controlled polymerization in micro-emulsion. The FNPs are flexible, tunable and versatile: emission brightness, colors(s), size and surface chemistry can easily be controlled through the choice, combination, and organization of their building blocks.

We have developed water-soluble core-shell boron-dipyrromethene (BODIPY) polymeric particles [1] with different surface functional groups[2]. Core contains BODIPY, which depending on its substitute group, could emit green or red spectrum. Shell consists of hydrophylic block copolymers such as PAA-PEO.

We will show how such red-FNPs can be used to detect bacteria growth on a surface, thanks to pH sensitivity.

In a second part we will discuss how green-FNPs could be used to study inter- and intra-diffusion in cell plants [3].

Finally we will introduce newly developed nanovectors for photoacoustic imaging.

[1] *J. Phys. Chem. C*, 2014, 118, 13945

[2] *Biosens. Bioelectron*, 2016, 75, 320

[3] *Applied Physics Express*, 2020, 10.35848/1882-0786/abc490