

## PHOTOTHERMAL MOLECULES AND NANOPARTICLES

Isabelle Toubia,<sup>1</sup> Marie Millard,<sup>1</sup> Jérémy Pécourneau,<sup>1</sup> Yann Bernhard,<sup>1</sup> Henri-Pierre Lassalle,<sup>2</sup> Stéphanie Grandemange,<sup>2</sup> Maxime Mourer,<sup>1</sup> Stéphane Parant,<sup>1</sup> [Andreea Pasc](mailto:andreea.pasc@univ-lorraine.fr)<sup>1</sup>

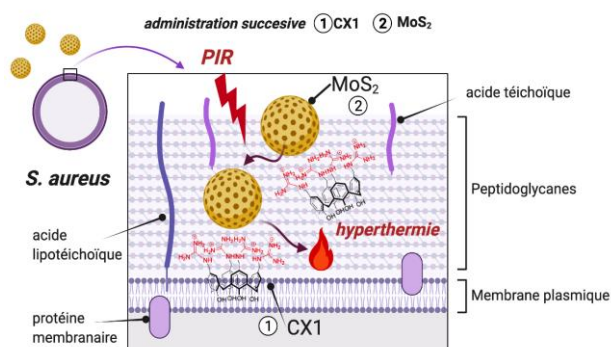
<sup>1</sup> L2CM UMR 7053, University of Lorraine and CNRS, Bvd des Aiguillettes, 54506 Vandoeuvre lès Nancy, France ([andreea.pasc@univ-lorraine.fr](mailto:andreea.pasc@univ-lorraine.fr))

<sup>2</sup> CRAN UMR 7039, University of Lorraine and CNRS, Bvd des Aiguillettes, 54506 Vandoeuvre lès Nancy, France

Among photo-assisted therapies and beyond PDT, photothermal therapy (PTT) is a relatively novel explored strategy based on local hyperthermia aiming anticancer or anti infectious potential applications. Compared to other therapies, PTT is highly selective and exhibits low side effects. This is due to the fact that the heat is localized, under the controlled illumination of the desired site and in the presence of the photothermic agent.

Both nanoparticles and molecular probes may exhibit photothermal properties, by illumination in the optic therapeutic window, under mono or biphotonic excitation. Some recent examples developed by our group will be presented, from inorganic to organic particles to molecular biphotonic fluorophores or photoswitches.

The impact of the molecular design on the photothermal properties and consequently on phototoxicity will be highlighted, e.g. for calixarene-derived MoS<sub>2</sub> nanoparticle (see figure below) and indocyanine green aggregates as well as two-photon absorbing stilbene-derived fluorophores.<sup>1-2</sup>



### References

<sup>1</sup> J. Pecourneau et al, *J. Org. Chem.*, **2021**, 86, 12, 8112

<sup>2</sup> R. Losantos, J. Pecourneau et al *Phys. Chem. Chem. Phys.*, **2021**, 23, 12842