

Plasmonic hollow nanocapsules as a versatile platform for cancer management

Pilar Rivera Gil

Integrative Biomedical Materials and Nanomedicine Lab,
Department of Medicine and Life Sciences, Universitat
Pompeu Fabra, Barcelona, Spain

pilar.rivera@upf.edu

We present a nanotechnological platform consisting of 3 main building blocks i.e., a cancer target, a monoclonal antibody towards this target, and a nanoformulation. The main working principle of this platform is based on tumor targeting. We specifically recognize Zip4, a tumor target presents only in the epithelium of tumoral cells. Based on this recognition, the platform can target and controlled the delivery of an active ingredient.

To validate the technology, we first proved in vitro and in vivo specific tumor targeting and now we are validating the efficiency of targeting the chemotherapeutics vs. its non-targeted form. One big advantage of this platform is its versatility since the 3 building blocks can be used all together or independently. Furthermore, the nanoformulation is itself composed of different building blocks that can be assembled differently yielding different properties to the nanomaterial. For example, in one configuration the nanomaterial has photothermal properties for melanoma treatment or for photodynamic therapy, while in other configuration it has SERS sensing properties. I will present this platform and examples for its biomedical applications.

References

- [1] R. Xu, et al., accepted J of Drug Targeting 2024.
 - [2] C. Xiao, V. Izquierdo-Roca, P. Rivera-Gil. ACS Mater. Au 2023, 3, 2, 164–175.
 - [3] P. Zamora-Pérez, et al., Acta Biomaterialia 2022, 142, 308-319.
 - [4] P. Zamora-Pérez, Q. Xiao, et al., revision submitted to Nanoscale 2024.
 - [5] T. Zhou, R. Vicente, P. Rivera Gil. Accepted in ACS Omega 2024.
 - [6] C. Xiao, et al., revision submitted to Advanced Optical Materials 2024.
-