

Thanks to their high electron density and ultrasmall size, gold nanoclusters (Au NCs) have unique luminescence and photo-electrochemical properties that make them very attractive for diagnosis, bio-imaging and theranostics. These applications require control of their delivery and interaction with cells and more particularly with the cell membrane. The Au NCs surface chemistry permits to control their interaction with lipid membranes. Here we demonstrate their ability of the AuNCs as markers of lipidic structures. Thanks to electrostatic interaction, the AuNCs adhere strongly to lipid vesicle membranes without altering their structure. SAXS technique makes possible to localize the Au atoms at the vicinity of the phosphatidyl ammonium lipidic headgroups thanks to their high electronic density. In addition, we present a simple method for the encapsulation of the luminescent AuNC into liposomes without disturbing their integrity. These gold nanostructures can therefore serve as biomarkers of lipidic structures such as extracellular vesicular structures but can also be incorporated into liposomal cargos for targeting and drug delivery.