Abstract

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Luminescent metal nanoclusters for nanosensing in living environment

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Gold nanoclusters (AuNCs) are attractive candidate as long-lived luminescence sensors. Their ultrasmall size (< 2 nm) and large window of luminescence lifetime (from nano to microsecond) as well as their good biocompatibility make them an attractive alternative to fluorescent molecular probes or proteins[1].

We present the synthesis of original ultra-small luminescent peptidic AuNC sensitive to the pH. The versatility of small peptides permits to adjust the emission wavelength and the sensitivity of the emission intensity as well as the luminescent lifetime to the pH. This chemical plateform provides various charged AuNC with potential sensitivity to the environment for biosensing applications.

Due to their ultra-small size, these nanoprobes are shown to be easily internalized into subcellular compartment such as cell nuclei [2] or deliver to synthetic [3] or biological vesicles [4]. Yet their interaction with plants according to different ways of administration has not yet been explored. Here various peptidic luminescent gold nanoclusters with different surface charge were administrated to photosynthetic living organism *Thaliana Arabidopsis,* used as a model by different ways through a depositived drop on a leaf or by incubation of the roots in the nutrient buffer. Depending of the administration way, their biodistribution in the leave and roots was investigated by optical confocal microscopy. [5].

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Abstract

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