TWO-PHOTON PHOTOLYSIS OF 2-NITROBENZALDEHYDE MONITORED BY FLUORESCENT LABELED NANOCAPSULES

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In this paper we report for the first time experimental evidence of two-photon photolysis of a caged proton compound, 2-nitrobenzaldehyde (o-NBA, MW=151.1). This compound undergoes 1-photon absorption within 320-360 nm range and its uncaging shows strict analogies with Ca^{2+}-caged compounds. Since the use of UV excitation could induce biological damage, we moved to two photon absorption-uncaging processes. Two-photon excitation microscopy is also used to monitor the uncaging process by imaging the pH-dependent emission of fluorescein isothiocyanate embedded in a nanostructured system, nanocapsule. Nanocapsules allow improving stability in fluorescence monitoring. Moreover, an original image processing method is introduced in order to quantify the uncaging. We used a femtosecond Ti:Sa laser tuned at 720 nm, ≈200 fs at the sample, delivered through an adapted confocal laser scanning head. We show that upon 1-minute exposure high power (45-50 mW) it is possible to obtain appreciable photolysis of 2-nitrobenzaldehyde. We have also demonstrated that nanocapsules are a suitable system as fluorescence sensor.