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Light-assisted oxidation of carbon nanohorns for enhancing bio-compatibility MINFANG ZHANG, JST/SORST, MASAKO YUDASAKA, JST/SORST and NEC, KUMIKO AJIMA, JST/SORST, SUMIO IJIMA, JST/SORST, NEC, and Meijo Univ. — Single-wall carbon nanohorn (SWNH) has a structure similar to single-wall carbon nanotubes but with a larger diameters (2-5 nm) and shorter lengths (40-50 nm), and about 2000 of them assembled to form a spherical aggregate with a diameter of about 100 nm. For various applications of SWNHs, the chemical modification is the crucial issue. To chemically modify SWNHs, the $-\text{COOH}$ groups at the holes edges are useful. We show in this report that $-\text{COOH}$ groups are formed abundantly when SWNHs were oxidized with H_2O_2 under the light irradiation (Xe lamp). SWNHox thus obtained well dispersed by themselves in water, which was even more enhanced by attaching proteins to SWNHox. The modification with proteins effectively enhance the bio-compatibility of SWNHox, which was confirmed through in vitro assay using the mammalian cells.

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