

Graphene Oxide-Based Nanocarriers Loaded with Photosensitizers for Photodynamic Therapy

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Graphene oxide (GO) was functionalized with hyaluronic acid (HA) and then loaded with photosensitizers (Ce6) for cancer targeting and photoactivity-switchable nanoplatfoms for photodynamic therapy (PDT). Through ¹H NMR, UV, TGA, AFM, DLS and MTT assays, the HA-GO hybrids were the potential candidate as drug carriers. Mainly due to the π - π stacking as well as hydrophobic interactions, the HA-GO hybrids were highly loaded with Ce6. The effective cellular internalization of the HA-GO/Ce6 hybrids into cancer cells that overexpresses HA receptors were demonstrated by CLSM and FACS. The photoactivity of Ce6 loaded onto the HA-GO hybrids was initially quenched in aqueous solution to ensure biocompatibility, but the photoactivity was quickly recovered after the release of Ce6 from the HA-GO hybrids upon cellular uptake. The HA-GO/Ce6 nanocarriers significantly improved the PDT efficiency ~ 10 times higher than the efficiency obtained with free Ce6.