Photodynamic Therapy Utilizing Upconversion Nanoparticles

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Abstract:

PDT is a treatment method to attack cancer cells by generating singlet oxygen by administering a photosensitizing agent with tumor affinity and irradiation with light. However, there have been issues, such as the limited use of PDT due to the problem of light penetration into cells. To solve this problem, we investigated using up-conversion particles, which convert near-infrared light into visible light, for PDT. The rare earth ions (Tm3+, Yb3+, Y3+) contained in the up-conversion particles were confirmed by STEM EDX. The particle size was found to be 116 nm by DLS measurement. Phototoxicity tests showed that the particles exhibited good phototoxicity.