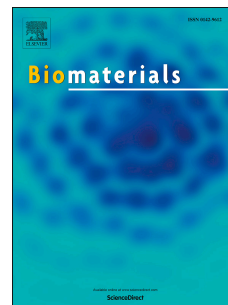


# Accepted Manuscript

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# Multifunctional Melanin-like Nanoparticles for Bone-targeted Chemo-photothermal Therapy of Malignant Bone Tumors and Osteolysis

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**Abstract:** Malignant bone tumors associated with aggressive osteolysis are currently hard to be cured by the clinical strategies. Nevertheless, nanomedicine might provide a promising therapeutic opportunity. Here, we developed a multifunctional melanin-like nanoparticle for bone-targeted chemo-photothermal treatment of malignant bone tumors. The particles was originally fabricated from alendronate-conjugated polydopamine nanoparticles (PDA-ALN) that exhibited excellent photothermal effect and high affinity to hydroxyapatite. PDA/Fe-ALN significantly enhanced the magnetic resonance contrast of the bone tumors *in vivo*, suggesting that more PDA-ALN accumulated at the osteolytic bone lesions in the tumors compared with the non-targeting PDA. Chemodrug SN38 was efficiently loaded on PDA-ALN, and the drug release could be triggered by near-infrared irradiation and acidic stimulus. Finally, the combined chemo-photothermal therapy efficiently suppressed the growth of bone tumors and reduced the osteolytic damage of bones at a mild temperature around 43 °C. This study provides an efficient and robust nanotherapeutics for

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