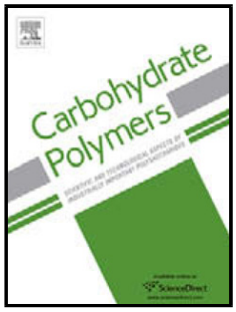

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Bio-responsive alginate-keratin composite nanogels with enhanced drug loading efficiency for cancer therapy

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Highlights

- We synthesized functional nanogels with high drug loading capacity.
- These nanogels have around 80 nm and enzyme-/GSH- responsive property.
- DOX loaded nanogels showed excellent inhibitory effects on tumor cells in vitro.
- DOX loaded nanogels had a better anti-tumor effect and lower side effects in vivo.

ABSTRACT: This article presents a novel dual-stimuli responsive nanogel prepared from human hair keratin and alginate through simple crosslinking method. Keratin offer the crosslinking structure and bio-responsive ability and alginate ameliorated properties of nanogels including particle size, stability and drug loading capacity. The resultant keratin-alginate nanogels (KSA-NGs) could function as promising vectors for doxorubicin hydrochloride (DOX) with a super-high drug-loading rate of 52.9% (w/w) and dual-stimuli responsive behavior to GSH and trypsin.