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Enzyme-activated intracellular drug delivery with tubule clay nanoformulation

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Abstract

Fabrication of stimuli-triggered drug delivery vehicle s is an important milestone in treating cancer. Here we demonstrate the selective anticancer drug delivery into human cells with biocompatible 50-nm diameter halloysite nanotube carriers. Physically-adsorbed dextrin end stoppers secure the intercellular release of brilliant green. Drug-loaded nanotubes penetrate through the cellular membranes and their uptake efficiency depends on the cells growth rate. Intercellular glycosyl hydrolases-mediated decomposition of the dextrin tube-end stoppers triggers the release of the lumen-loaded brilliant green, which allowed for preferable elimination of human lung carcinoma cells (Crossed D sign 549) as compared with hepatoma cells (Hep3b). The enzyme-activated intracellular delivery of brilliant green using dextrin-coated halloysite nanotubes is a promising platform for anticancer treatment.

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