Oral Administration of Targeted Nanoparticles Inhibits *Helicobacter pylori* and Gastric Cancer Growth *in vitro* and *in vivo* Studies

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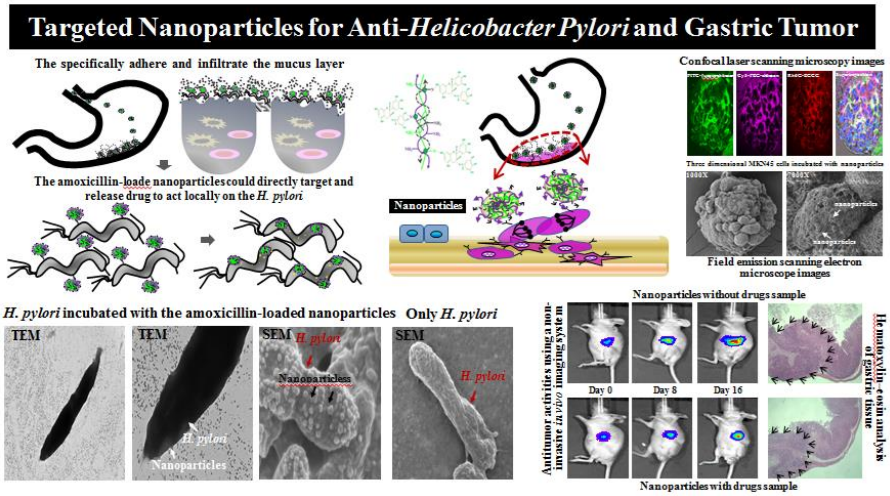
Helicobacter pylori, a prevalent human-specific pathogen, is a gram-negative spiral, with four to seven sheathed flagella at one end, which colonizes on the surface of the epithelium (beneath the mucus layer) of the gastric antrum, causing inflammation or active chronic gastritis, gastric ulcers, and gastric adenocarcinoma. And, gastric carcinoma has a dismal prognosis because of its aggressiveness and lack of effective therapies. Therefore, new strategies to improve treatment and survival are urgently required. The present study evaluated a potential drug delivery system comprising the amoxicillin or green tea polyphenol extract epigallocatechin-3-gallate entrapped within fucose-conjugated chitosan nanoparticles, allowing topical administration of the drug through a site-specific and target-activated release in the stomach for oral treatment of anti-*Helicobacter pylori* and gastric carcinoma. The results show that the prepared targeted nanoparticles with pH-responsive characteristics can protect drugs from destruction by gastric acids, allowing the drug to infiltrate the mucus layer, activate contact with *H. pylori* situation and gastric cancer tissue, and significantly enhance the suppressive effect of amoxicillin or epigallocatechin-3-gallate on *H. pylori* or gastric cancer growth. These *in vivo* results clearly indicate that nanoparticles produce a greater anti-*H. pylori* or gastric tumor effect and are effective in reducing gastric and liver inflammation in the orthotopic gastric tumor mouse model. Investigating these issues further will improve nanoparticle combination with the addition of various chemotherapeutic agents and application to studies of clinical treatment.



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