評估可同時包覆 epigallocatechin gallate 和 amoxicillin 雙重藥物的標靶性奈米載體於抑制胃幽門螺旋桿菌之應用

Evaluation of fucose-chitosn/gelatin encapsulated with epigallocatechin gallate and amoxicillin nanoparticles on *Helicobacter pylori* eradication

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Helicobacter pylori is considered to be an important etiological factor in gastric ulcer disease and have been suggested as a cause of gastric carcinoma. It was known that amoxicillin and epigallocatechin-3-gallate were not stable in gastric acid, and the short residence time of the drug in the stomach which prevents effective antimicrobial concentrations being achieved in the gastric mucous layer or epithelial cell surfaces where *H. pylori* exists. In the study, a platform technology in developing anti-*H.pylori* drug (amoxicillin and epigallocatechin-3-gallate) incorporated in nanoparticles composed of fucose-chitosan and gelatin is proposed for targeting and eradicating *H. pylori*. The prepared nanoparticles was examined their physicochemical characteristics with fourier transformed infrared spectroscopy, transmission electron microscopy, and dynamic light scattering. In our results, the prepared nanoparticles was stability at pH 2.5-7.4 and their particles size was 200–300 nm with a positive surface charge, and *in vitro* drug release analysis from nanoparticles indicated that the system can control drug release in the simulated gastrointestinal dissolution medium. The *in vitro* analysis of the effect of the nanoparticles and their mechanism of interaction with *H. pylori* were investigated in the human gastric mucosal AGS cell line (human gastric adenocarcinoma cell line) with confocal laser scanning microscopy. The amoxicillin and epigallocatechin-3-gallate−loaded fucose-chitosan/gelatin nanoparticles could localize at intercellular spaces or in the cell cytoplasm, the site of *H. pylori* infection, and significantly inhibit *H. pylori* growth.

Keywords: *Helicobacter pylori*, nanoparticles, amoxicillin, epigallocatechin-3-gallate