Gemifloxacin, a Fluoroquinolone Antimicrobial Drug, Inhibits Migration and Invasion of Human Colon Cancer Cells

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Purpose:
Gemifloxacin (GMF) is an orally administered broad-spectrum fluoroquinolone antimicrobial agent used to treat acute bacterial exacerbation of pneumonia and bronchitis. Although fluoroquinolone antibiotics have also been found to have anti-inflammatory and anticancer effects, studies on the effect of GMF on treating colon cancer have been relatively rare. The study investigate the antimetastasis activities of GMF in colon cancer and the possible mechanisms involved.

Materials and Methods:
The study examined the cell Migration and Invasion of SW620 and LoVo cells. We assessed the effect of gemifloxacin on epithelial-mesenchymal transition markers in SW620 cells. Next we knockdown and overexpression of snail, an important transcription factor in regulating cell migration and EMT, in order to investigate the colon cancer cell migration and invasion.

Results:
The result has shown that GMF inhibits the migration and invasion of colon cancer SW620 and LoVo cells and causes epithelial mesenchymal transition (EMT). In addition, GMF suppresses the activation of NF-κB and cell migration and invasion induced by TNF-α and inhibits the TAK1/TAB2 interaction, resulting in decreased IκB phosphorylation and NF-κB nuclear translocation in SW620 cells. Furthermore, Snail, a critical transcriptional factor of EMT, was downregulated after GMF treatment. Overexpression of Snail by cDNA transfection significantly decreases the inhibitory effect of GMF on EMT and cell migration and invasion.

Conclusion:
GMF may be a novel anticancer agent for the treatment of metastasis in colon cancer.