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Titel des Beitrags: Evidence for conserved function of γ-glutamyltranspeptidase in Helicobacter genus.

Abstract: The confounding consequences of Helicobacter bilis infection in experimental mice populations are well recognized, but the role of this bacterium in human diseases is less known. Limited data are available on virulence determinants of this species. In Helicobacter pylori, γ-glutamyltranspeptidase (γGT) contributes to the colonization of the gastric mucosa and to the pathogenesis of peptic ulcer. The role of γGT in H. bilis infections remains unknown. The annotated genome sequence of H. bilis revealed two putative ggt genes and our aim was to characterize these H. bilis γGT paralogues. We performed a phylogenetic analysis to understand the evolution of Helicobacter γGTs and to predict functional activities of these two genes. In addition, both copies of H. bilis γGTs were expressed as recombinant proteins and their biochemical characteristics were analysed. Functional complementation of Escherichia coli deficient in γGT activity and deletion of γGT in H. bilis were performed. Finally, the inhibitory effect of T-cell and gastric cell proliferation by H. bilis γGT was assessed. Our results indicated that one gene is responsible for γGT activity, while the other showed no γGT activity due to lack of autoprocessing. Although both H. bilis and H. pylori γGTs exhibited a similar affinity to L-Glutamine and γ-Glutamyl-p-nitroanilide, the H. bilis γGT was significantly less active.
Nevertheless, H. bilis ?GT inhibited T-cell proliferation at a similar level to that observed for H. pylori. Finally, we showed a similar suppressive influence of both H. bilis and H. pylori ?GTs on AGS cell proliferation mediated by an apoptosis-independent mechanism. Our data suggest a conserved function of ?GT in the Helicobacter genus. Since ?GT is present only in a few enterohepatic Helicobacter species, its expression appears not to be essential for colonization of the lower gastrointestinal tract, but it could provide metabolic advantages in colonization capability of different niches.