P78

Effects on the virulence of *Vibrio fluvialis* by heme utilization protein gene (*hupO*) mutation

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In pathogenic bacteria, iron acquisition is important for colonization and proliferation in host under iron-limited conditions. *Vibrio fluvialis*, an enteropathogenic gram negative bacterium, causes gastroenteritis or excessive watery diarrhea in humans. In this study, we identified the heme utilization protein gene (*hupO*) from *V. fluvialis* (ATCC 33809) and constructed *hupO* mutant, HP1, to investigate the effects on the virulence of *hupO* in *V. fluvialis*. Recoveries and survival rates in the mouse stomach and intestine infected with the wild-type and the mutant, and histopathology of the infected intestines were compared. After the wild-type and the mutant HP1 strains were orally infected into 7-day-old mice, recoveries of each strain were reduced to 0.07% and 0.002%, respectively. Recover of wild-type strain is 35-fold as high as that of mutant HP1. The intestines were also isolated from mice and investigated by microscopy. As the result, significant damage was visible in the intestinal mucosa infected with wild-type, while less damage was caused by mutant HP1.