Helicobacter Pylori Induces Surface Microprocess Change In Ags And HEP-G2 Cell Lines

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Background: The mechanisms of H. pylori attachment to the gastric epithelial cells are still controversial. To understand the direct interaction of H. pylori with host cells, the surface structures of cultured AGS and Hep-G2 cells were observed by electron microscopy. Also, because it is well known that the different rho-GTPases are related to the different forms of surface microprocesses, the expression of rho-GTPases was investigated.

Materials and Methods: Hep-G2 and AGS cells were cultured in DMEM with 10% FBS, and exposed to H. pylori at a density of O.D. of 1 at 600 nm for 0.5, 1, 2 and 4 hrs. The cells were fixed and processed for electron microscopy by routine methods, and observed. Other cells were fixed and labeled with primary antibodies against rho, rac1, and cdc42, visualized with FITC- or TRITC-labeled secondary antibodies, and observed with Zeiss fluorescent microscope with appropriate filter sets.

Results: Scanning electron microscopy revealed many microprocesses including microvilli, filopodia, and membrane ruffles over the cultured cells, which decreased in number at first, and then reappeared. H. pylori was in close contact with membrane ruffles. Transmission electron microscoopy confirmed the SEM observation. Rho-immunofluorescent labeling appeared as small spots without H. pylori, which changed into patches in cocultures. Rac1 expression was observed in lamellipodia at 1 and 2 hr cocultures. Interestingly, cdc42 labeling was not identified.

Conclusions: These results suggested the involvement of surface microprocesses, especially membrane ruffles and rac1 in establishing adhesion between H. pylori and host cells. The meaning of the surface microprocess changes in gastric pathology needs to be further investigation with a special reference to the pathophysiological behavior of H. pylori to the gastric epithelial cells both in vivo and in vitro.