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Infection with *Holospora obtusa* changes digestive vacuole formation in the host, *Paramecium caudatum*

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The Gram-negative bacterium *Holospora obtusa* is an endonuclear symbiont of the ciliate *Paramecium caudatum*. *Holospora* cannot coexist in a host cell with other bacteria belonging to the same genus. For example, *H. obtusa*-bearing cells (symbiotic cells) eliminate newly introduced *H. elegans* from the host cell. However, it is unknown whether further bacteria of the same species are also eliminated from the symbiotic cells. Both non-*H. obtusa*-bearing (aposymbiotic) and symbiotic cells were mixed with infectious forms of *H. obtusa*, and were observed at 0.5–1.5 and 5–6h after mixing. Compared with the aposymbiotic cells, the symbiotic cells formed fewer digestive vacuoles against the newly added *H. obtusa*. However, the aposymbiotic cells showed decreased digestive vacuole formation to *H. obtusa* at 6h after mixing, although they did not decrease activity against the food bacterium *Klebsilella pneumoniae*, Chinese ink, the reproductive form of *H. obtusa*, or boiled or frozen infectious forms of *H. obtusa*. These results suggest that *P. caudatum* acquires the ability to distinguish the infectious form of *H. obtusa* from other objects within 5h after infection with *H. obtusa*.