

Distinct intensity of host-pathogen interactions in *Chlamydia psittaci*- and *Chlamydia abortus*-infected chicken embryos.

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Abstract

Factors and mechanisms determining the differences in virulence and host specificity between the zoonotic agents *Chlamydia psittaci* and *Chlamydia abortus* are still largely unknown. In the present study, two strains were compared for their invasiveness, virulence, and capability of eliciting an immune response in chicken embryos. On breeding day 10, embryonated chicken eggs were inoculated with 5×10^4 inclusion-forming units. As shown by immunohistochemistry and quantitative real-time PCR, *C. psittaci* displayed a significantly better capability of disseminating in the chorioallantoic membrane (CAM) and internal organs than *C. abortus*. The higher infectious potential of *C. psittaci* in birds was underlined by significantly higher mRNA expression rates of essential chlamydial genes, such as *incA*, *groEL* (in CAM, liver, and spleen), *cpaf*, and *ftsW* (in CAM). Although the immune responses to both pathogens were similar, *C. psittaci* elicited higher macrophage numbers and a stronger expression of a subset of immune-related proteins. The data imply that invasiveness of *Chlamydia* spp. and propagation in the host are not solely dependent on

the level of host immune response but, even to a greater extent, on the expression of bacterial factors related to virulence. The fact that *C. psittaci* has coped far better than *C. abortus* with the avian embryo's response by upregulating essential genes may be a key to understanding the mechanisms underlying host adaptation and etiopathology.

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