Contribution of toll-like receptors 2 and 4 in an oral Yersinia enterocolitica mouse infection model.

A characteristic of the three human-pathogenic Yersinia spp. (the plague agent Y. pestis and the enteropathogenic Y. pseudotuberculosis and Y. enterocolitica) is the expression of the virulence (V)-antigen (LcrV). LcrV is a released multifunctional protein which is involved in contact-induced secretion of Yersinia antihost proteins and in evasion of the host innate immune response. Recently, we reported that recombinant LcrV signals in a CD14- and TLR2-dependent fashion leading to immunosuppression by interleukin-10 (IL-10) induction. The impact of this immunosuppressive effect for Yersinia pathogenesis was underlined by the observation that IL-10- and TLR2-deficient mice were found to be less susceptible to Y. enterocolitica infection than isogenic C57BL/6 wild-type animals. In the present study, we show that Y. enterocolitica leads to higher IL-10 and lower TNF-alpha levels in spleens from infected C57BL/6 wild-type mice than in those from TLR2-deficient mice. By comparing Y. enterocolitica infection in TLR2-, TLR4-, and TLR2/TLR4-deficient mice, we found that TLR2 is more important in yersiniosis than TLR4. Strikingly and in contrast to the results obtained in TLR2-deficient mice of C57BL/6 background, TLR2-deficient mice of C3H genetic background were more susceptible to an oral Y. enterocolitica infection than wild-type C3H mice. To
our knowledge, this is the first report on a divergent influence of a TLR-deficiency on infection outcome in mice of different genetic backgrounds.