Simultaneous immunization of mice with Omp31 and TF provides protection against Brucella melitensis infection.

Abstract:

Brucella vaccines consisting of live attenuated Brucella strains are currently used in livestock, but safety concerns preclude their application in humans. Subunit vaccines have recently emerged as safe and efficacious alternatives in both humans and animals. In this study, subunit vaccines were developed that consisted of a recombinant outer membrane protein (rOmp31) and the trigger factor chaperone protein (rTF) of Brucella melitensis, either alone or in combination. BALB/c mice that were immunized with rOmp31+rTF showed comparable but slightly higher TF-specific IgG1 and IgG2a antibodies as compared to mice with rTF alone. Indeed, mice given this combination had titers of rOmp31-specific antibodies similar to those immunized with rOmp31 alone. In lymphocyte reactivation experiments, the splenocytes of immunized mice, whether given either of these antigens alone or as a cocktail, exhibited a strong antigen-specific recall proliferative response and expressed high amounts of IFN-?, IL-12, IL-10 and IL-6. Both rTF and rTF+rOmp31 vaccinated mice exhibited significantly higher CD4 and CD8 levels compared to the PBS group. The combination of rOmp31 and rTF provided protection against B. melitensis infection comparable to that of vaccine strain Rev.1. In comparison to rTF alone, combination of rTF and rOmp31
caused only a slight increase in protection level. Although combination of rTF and rOmp31 caused a non-significant increase in IFN-γ induction, antibody level, proliferation index and CD4 and CD8 frequencies compared to rTF alone, its cumulative effects on aforesaid parameters may be viewed as a better efficacy.