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# Protection efficacy of Argentinian isolates of *Mycobacterium avium* subsp. *paratuberculosis* with different genotypes and virulence in a murine model.

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## Abstract

Paratuberculosis is a chronic disease caused by *Mycobacterium avium* subsp. *paratuberculosis* (*Map*). The disease causes economic losses and, therefore, it is imperative to follow proper control strategies, which should include an effective vaccine. Several strategies have assessed the virulence and immune response of *Map* strains that could be used as a vaccine. This study evaluates the degree of virulence, immune response, and protection of Argentinian strains of *Map* with different genotype in a murine model. Four local isolates (Cattle type) with different genotypes (analyzed by MIRU-VNTR and SSRs) were selected and evaluated in a virulence assay in BALB/c mice. This assay allowed us to differentiate virulent and low-virulence *Map* strains. The less virulent strains (1543/481 and A162) failed to induce a significant production of the proinflammatory cytokine IFNg, whereas the virulent strain 6611 established infection along with a proinflammatory immune response. On the other hand, the virulent strain 1347/498 was efficient in establishing a persistent infection, but failed to promote an important Th1 response compared with 6611 at the evaluated time. We selected the low-virulence strain 1543/498 as a live vaccine and the virulent strain 6611 as a live and inactivated vaccine in a protection assay in mice. Strain 1543/481 failed to protect the animals from challenge, whereas strain 6611, in its live and inactivated form, significantly reduced the CFUs count in the infected mice, although