Recombinant Ag85B vaccine by taking advantage of characteristics of human parainfluenza type 2 virus vector showed Mycobacteria-specific immune responses by intranasal immunization.

Viral vectors are promising vaccine candidates for eliciting suitable Ag-specific immune response. Since *Mycobacterium tuberculosis* (Mt) normally enters hosts via the mucosal surface of the lung, the best defense against Mt is mucosal vaccines that are capable of inducing both systemic and mucosal immunity. Although *Mycobacterium bovis* bacille Calmette-Guérin is the only licensed tuberculosis (TB) vaccine, its efficacy against adult pulmonary forms of TB is variable. In this study, we assessed the effectiveness of a novel mucosal TB vaccine using recombinant human parainfluenza type 2 virus (rhPIV2) as a vaccine vector in BALB/c mice. Replication-incompetent rhPIV2 (M gene-eliminated) expressing Ag85B (rhPIV2·Ag85B) was constructed by reverse genetics technology. Intranasal administration of rhPIV2·Ag85B induced Mt-specific immune responses, and the vaccinated mice showed a substantial reduction in the number of CFU of Mt in lungs and spleens. Unlike other viral vaccine vectors, the immune responses against Ag85B induced by rhPIV2·Ag85B immunization had an advantage over that against the viral vector. In addition, it was revealed that rhPIV2·Ag85B in itself has an adjuvant activity through the retinoic acid-inducible gene I receptor. These findings provide further evidence for the possibility of rhPIV2·Ag85B as a novel TB vaccine.