The rapid and safe immunization of populations is critical in response to emerging infectious diseases or biological attacks. Currently, many subunit vaccines are insufficiently immunogenic to protect against pathogen invasion, therefore novel adjuvants are required. The antigen display on Bacillus endospore system provides a unique antigen delivery system with inherent adjuvant properties that is suitable for both parenteral and noninvasive delivery routes of immunization. This dissertation describes the development of this novel antigen display system. In addition, initial immunogenicity studies were performed utilizing the model antigen β-galactosidase. Furthermore, this study demonstrates that UV-irradiated *B. thuringiensis* spores elicit potent innate immune responses from murine, bone marrow-derived dendritic cells. Finally, the protective capacity of this vaccine platform was investigated using the low calcium response V antigen (LcrV), a dominant antigen of *Yersinia pestis.* LcrV was efficiently displayed on the surface of biotinylated *Bacillus thuringiensis* spores. Mice immunized with spore-displayed LcrV rapidly develop high-titer systemic IgG antibodies and were protected from a lethal intranasal plague challenge. These data imply that the spore-displayed antigen system is a potent adjuvanted microparticle delivery system that is suitable for parenteral or mucosal immunizations against emerging infectious diseases and potential biological weapons.