Francisella tularensis and Yersinia pestis are bacteria that are classified as potential bioterrorism agents by the Centers for Disease Control and Prevention. A vaccine that is capable of producing protective immunity against multiple bioterror agents would be especially desirable. Therefore, the goal of this research is to create a vaccine that will produce immunity to both F. tularensis and Y. pestis. We are generating a construct in which the coding region for Tul4 (an immunodominant protein of F. tularensis) is linked to OmpA (a protective antigen of Y. pestis) under the control of a robust F. tularensis promoter. This construct will be expressed in F. tularensis Live Vaccine Strain. Patients who have been immunized with this strain show robust immunological memory (over three decades post-vaccination). After confirming expression of the chimeric Tul4-OmpA protein, mice will be immunized with the recombinant LVS strain and then subsequently challenged with both F. tularensis and Y. pestis to determine the efficacy of the vaccine strain. This research could lead to the generation and utilization of a bivalent vaccine targeting two possible bioterror agents; the strategy for vaccine construction could potentially be applied toward protection against other pathogens.