Vaccination Using Gene-Gun Technology.
Bergmann-Leitner ES¹, Leitner WW².

Author information
¹Malaria Vaccine Branch, Walter Reed Army Institute of Research, Silver Spring, MD, 20910, USA. elke.s.bergmannleitner.civ@mail.mil.
²National Institute of Allergy and Infectious Diseases, National Institutes of Health (NIH), Bethesda, MD, 20892, USA. wleitner@mail.nih.gov.

Abstract
DNA vaccines against infection with Plasmodium have been highly successful in rodent models of malaria and have shown promise in the very limited number of clinical trials conducted so far. The vaccine platform is highly attractive for numerous reasons, such as low cost and a very favorable safety profile. Gene gun delivery of DNA plasmids drastically reduces the vaccine dose and does not only have the potential to make vaccines more accessible and affordable, but also simplifies (a) the testing of novel antigens as vaccine candidates, (b) the testing of antigen combinations, and (c) the co-delivery of antigens with molecular adjuvants such as cytokines or costimulatory molecules. Described in this chapter are the preparation of the inoculum (i.e., DNA plasmids attached to gold particles, coating to the inside of plastic tubing also referred to as gene gun "bullets" or cartridges), the gene gun vaccination procedure, and the challenge of mice with Plasmodium berghei parasites to test the efficacy of the experimental vaccine.

KEYWORDS: Biolistic vaccine; DNA vaccines; Gene gun; Immunization; Particle-mediated epidermal delivery

PMID: 26450396 DOI: 10.1007/978-1-4939-2815-6_22