

on Vaccine Research

ABSTRACTS OF SUBMITTED POSTER PRESENTATIONS

expression in the germinated spore (i.e., the vegetative cell), and third, using a non-GM method of binding the antigen to spores. Using all three methods, humoral responses to MPT64 were detected. The most significant humoral and cellular responses resulted from intra-nasal delivery of MPT64 bound to spores of HU58, a human isolate of *B. subtilis*. These responses were noticeably better than when MPT64 was fused to a spore coat protein or expressed in the germinating spore. Using a challenge experiment intra-nasal delivery of HU58 spores coated with MPT64 protein conferred protection against tuberculosis following BCG priming. These results are encouraging and potentially demonstrate the potential of spores as a non-GM TB vaccine.

References:

1. Duc LH, Hong HA, Atkins HS, et al. Immunization against anthrax using *Bacillus subtilis* spores expressing the anthrax protective antigen. *Vaccine* 2007;25:346-355.
2. Duc LH, Hong HA, Fairweather N, Ricca E, Cutting SM. Bacterial spores as vaccine vehicles. *Infect Immun*. 2003;71:2810-2818.

P9 Adjuvant-Free Vaccine Potentiation Technique Demonstrated with Influenza Peptide M2e in Mice

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Objective: Describe a novel adjuvant-free immunization method with a test influenza peptide immunogen

A strategy for augmenting the potency of immunogens without the need for immune adjuvants is being developed. It is based on a recombinant immunotargeted fusion protein comprised of (1) a single chain fragment derived from a monoclonal antibody that recognizes a surface protein on murine erythrocytes, and (2) streptavidin. Any biotinylated immunogen can easily be affixed to this fusion protein via biotin-streptavidin linkage. The immunogen is targeted to the erythrocyte surface whence it is transported to the reticuloendothelial system and presented efficiently to the immune system. The M2e peptide, the ectodomain of the M2 protein shared by influenza virus A strains, was used as a test immunogen. Mice were immunized with peptide alone, peptide combined with the fusion protein, or peptide adsorbed onto alum. Sera collected one week after primary inoculation and again after two bi-weekly boosts were analyzed for peptide-specific IgG concentration by ELISA. Free M2e peptide (30 ug) generated 0.8 ug/mL anti-M2e IgG following two boosts. Adsorption of M2e peptide onto alum did not enhance the IgG response, but immunization with 330 ng M2e coupled to the fusion protein resulted in a peak of 14 ug/ml anti-M2e IgG, and even 37 ng M2e generated 1 ug/mL anti-M2e IgG. Taken together, the immune potency of M2e was increased more than 2,000-fold by linkage with the fusion protein. These results demonstrate the immunopotential of this adjuvant-free and versatile immunogen targeting strategy.

References:

1. Barber BH. The immunotargeting approach to adjuvant-independent subunit vaccine design. *Semin Immunol*. 1997;9:293-301.
2. Fu TM, Grimm KM, Citron MP, et al. Comparative immunogenicity evaluations of influenza A virus M2 peptide as recombinant virus-like particle or conjugate vaccines in mice and monkeys. *Vaccine* 2009;27:1440-1447.

P10 Safety, Tolerability and Immunogenicity of Recombinant Protective Antigen (rPA) Anthrax Vaccine Compared with Anthrax Vaccine Adsorbed (AVA) in a Healthy Population

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Objective: Review the safety and immunogenicity of anthrax vaccines

Background: This study evaluated the safety, tolerability and immunogenicity of a 3-dose priming series of SparVax™ rPA vaccine compared to AVA administered according to its package insert for general use in prophylaxis against anthrax. **Methods:** 226 healthy male and female volunteers, 18-55 years of age, were enrolled into 3 dose groups: 50 µg SparVax™ on Days 0, 28 and 56 (n = 91); 100 µg SparVax™ on Days 0, 28 and 56 (n = 92); 0.5 mL AVA on Days 0, 14, and 28 (n = 43). At day 182, subjects receiving SparVax™ were re-randomized to a challenge at the original dose, on either day 182 or 364. Safety and immunogenicity were assessed throughout the study. **Results:** The incidence of associated AEs was higher in the AVA group as compared to the SparVax™ groups, due mostly to injection site reactions. There were no notable differences between the SparVax™ groups and the AVA group regarding safety laboratory values, vital signs and ECG results. In the challenge phase, no differences in the AE profile between the SparVax™ dose groups were noted. Both vaccines were immunogenic following the 3-dose prime with response rates of approximately 90%. There were no significant differences in either TNA or ELISA geometric mean titers (GMT) between the vaccine groups 14 days after the 3rd vaccination. No differences seen between SparVax™ groups in terms of response rate or GMT measured by ELISA at the 6 or 12 month challenge. **Conclusions:** SparVax™ was safe, well-tolerated and produced antibody responses comparable to the licensed product. It appeared to be better tolerated than AVA with good immunologic memory demonstrated at 6 or 12 months.

Reference:

1. Duchars M. Review of rPA anthrax vaccine clinical data. In minutes of the Food and Drug Administration Center for Biologics Evaluation and Research Workshop, Anthrax Vaccines: Bridging Correlates of Protection in Animals to Immunogenicity in Humans. November 8, 2007; pp 226-252. <http://www.fda.gov/CBER/minutes/anth110807t.pdf>, accessed 3/31/09