

CAN WE ACHIEVE EFFECTIVE ORAL DELIVERY OF VACCINES? EVALUATING A NEW MICROSPHERE BASED CONTROLLED-RELEASE DELIVERY SYSTEM



Dr S Mohan Mohanraj
Director of Technology
PolyMicrospheres

By S. Mohan Mohanraj, PhD, and Meir Kende, PhD

ABSTRACT

In recent years, therapeutic proteins, such as vaccines, antigens, and hormones, have made significant advances using sophisticated biotechnological techniques like recombinant technology. However, the mode of administration has been a limiting factor. Frequent injections and low patient acceptability make even the simplest parenteral administration of these drugs problematic, thus there is a need for new delivery systems to deliver these drugs more effectively. Oral delivery of proteins and peptides has long been hailed the holy grail of drug delivery for obvious reasons (i.e. ease and cost of administration, patient compliance and acceptability) but has remained a challenge due to enzymatic degradation in the gastro-intestinal (GI) tract and low bioavailability.

Here we evaluate a microsphere based controlled-release delivery system that appears to have promising results. PolyMicrospheres successfully developed an oral delivery system for a recombinant vaccine that resulted in an antibody titre count three times higher than parenteral delivery. The microsphere based delivery system greatly enhanced immunity: 100% survival of mice against the toxin and 88% survival of rabbits against the live bacterial spores, compared with 0% survival with the aqueous recombinant protective antigen (RPA) system.

Figure 2. Efficacy of selected MDS systems in mice via Two-dose Oral Immunization, followed by anthrax-toxin challenge

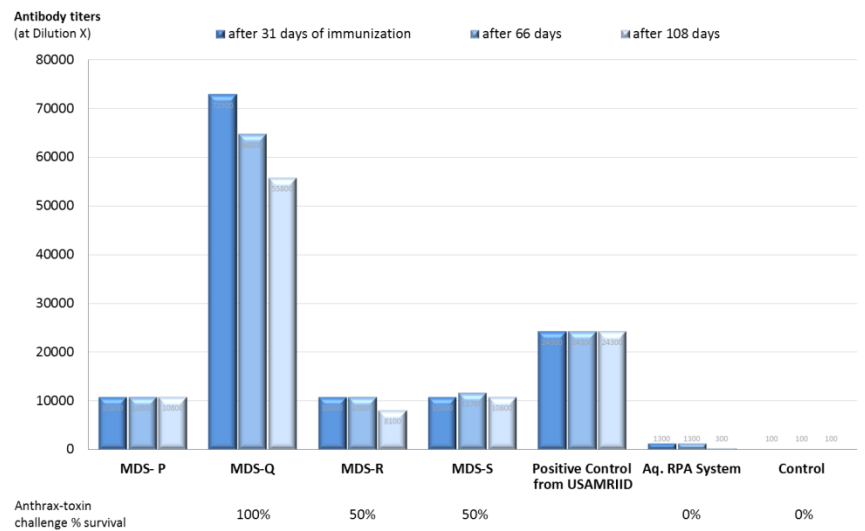


Figure 3. Efficacy of selected MDS systems in rabbits via Two-dose Oral Immunization, followed by live anthrax-spore challenge

