

Biodegradable Poly D,L-Lactide-Co-Glycolic Acid Microparticle Vaccine against *Aeromonas hydrophila* Infection

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Abstract : In aquaculture, vaccination is important to control and prevent diseases. In the study, we utilized poly D,L-lactide-co-glycolic acid (PLGA) microparticles (MPs) for encapsulating formalin-killed *Aeromonas hydrophila* cells. To assess the innate and adaptive immune responses, carps and loaches were used for the experiments. Fish were divided into three groups (A, B, C). Total antigen of 0.1 ml vaccine was adjusted by 2×10^8 CFU and injected via intraperitoneal route. Group A was vaccinated with 0.1 ml of PLGA vaccine, group B was with 0.1 ml of FKC vaccine and group C was with 0.1 ml of sterile PBS. All three groups were challenged with *A. hydrophila* and challenge dose was lethal dose (LD50). Loaches and carp were then challenged with *A. hydrophila* at 12 and 20 weeks post vaccination (wpv), and 10 and 14 wpv, respectively, and relative survival rates were calculated. For both fish species, the curve of antibody titer over time was shallower in the PLGA group than the FKC group and the PLGA groups demonstrated higher survival rates at all time-points. In the groups of PLGA-MP, relative mRNA levels of IL-1 β , TNF- α , lysozyme C and IgM were significantly upregulated than FKC treated groups. Biodegradable PLGA microparticle vaccine could induce longer immune responses than original FKC vaccines to protect from *A. hydrophila* infection.

Keywords : PLGA, microparticles, *Aeromonas hydrophila*, vaccine

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