

DEVELOPMENT OF A MUCOSAL ADJUVANT FOR FISH VACCINATION

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Vaccines rely on the acquired immune system and prime an animal to a particular antigen so that on subsequent encounter it is recognised and quickly destroyed. Most fish vaccines were developed in the 1990s, and three routes of administration are used; immersion and injection for priming, and oral for boosting (when needed). Injection vaccines were developed as a consequence of the need for an adjuvant in the formulation and have been very successful. However, they do have some drawbacks and it is timely to re-examine the potential for mucosally delivered vaccines that include adjuvants. Polyethyleneimine (PEI) is a polycation with potent mucosal and systemic adjuvant activity. PEI triggers both T and B cell responses in mammals by activating the innate and adaptive arms of the immune response. In this study varying doses of PEI were used to assess the adjuvant effect of PEI when used with a commercial immersion vaccine to *Yersinia ruckeri*, the causative agent of Enteric Redmouth Disease. We analysed immune gene expression in rainbow trout (*Oncorhynchus mykiss*) at days 1, 3, 7 and 10 post-vaccination, as well as serum antibody levels at weeks 6, 8 and 10. We found a trend towards enhanced durability of the antibody response across a dosage range of PEI but there was no evidence of enhanced pro-inflammatory gene expression in mucosal tissues (gills, skin) consistent with findings in mammals. This study helps refine the dose of PEI that is suitable for use in fish and serves as the basis of future experiments we plan to optimise further immersion delivery of fish vaccines.

Key words

Vaccination, rainbow trout, *Y. ruckeri*, mucosal adjuvant.

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