

# A Perspective of Oral Recombinant Vaccines Based on Microalgae

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In recent decades, microalgae biotechnology has become one of the most valuable sources of functional feed additives. Many microalgae are considered beneficial in aquaculture, because as nutritional supplements, they increase immunity-enhancing abilities, resistance to infectious diseases, and tolerance to environmental stress. Some of them are non-toxic and rich in antioxidants, so that they can be investigated as a drug carrier for humans or animals. Currently, there are successful cases of using microalgae to produce edible vaccines in the aquaculture industry. Most of the recombinant vaccines are produced based on *Chlamydomonas Reinhardtian* species. However, few commercial vaccines are available. It is also unclear how microalgae or their bioactive compounds may induce signals in the immune system of aquatic species. This article aims to collect published research on the potential of microalgae in the production of recombinant vaccines for aquaculture. In order to provide ideas for the development of recombinant microalgae oral vaccines in the future.

**Keywords:** Aquaculture, Active Compounds of Microalgae, Immune System, Recombinant Vaccines

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