Adaptable, Multi-Species, Attenuated Live Bacterial Vector Vaccine for Use in Aquaculture Systems that Eliminates Handling of Fish

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Technology description

Immersing Farm-Raised Fish Protects Against White Spot Disease and Induces Immunity Against Septicemia

This recombinant attenuated bacterial vaccine vector is the first live, attenuated bacterial vector developed specifically for use in fish raised in aquaculture systems. This technology enables vaccination against common diseases that afflict fish raised in aquaculture systems by immersion rather than injection. Currently, the most commonly used method for immunization in the aquaculture industry is intraelomicperitoneal injection, which is expensive, labor-intensive and stresses the fish. Clearly, the industry needs improved vaccines because infectious disease agents easily spread between individual fish grown in high density aquaculture systems. The economic losses due to disease morbidity and mortality in the aquaculture industry is approximately $3 billion annually.
Researchers at the University of Florida have developed a live, fully-attenuated bacterial vaccine that can be administered by bath immersion. This vaccine vector system can be effectively used with multiple different fish species and can be used to create multivalent vaccines.

Technology

This vaccine platform is based on a recombinant, fully-attenuated Edwardsiella bacterial vector that was chosen as the delivery vehicle because it efficiently attaches to and invades mucosal, gut, skin and gill associated lymphoid tissue in a wide variety of both fresh and saltwater fish species – including catfish, trout, salmon and tilapia. This then allows fish to be vaccinated by immersing them in a bath containing the bacterial vector. Proof-of-concept has been demonstrated using the vector to express an antigen from the protozoan parasite Ichthyophthirius multifilis. However, the attenuated Edwardsiella bacterial vector also can be used to express antigens that will provide protection against other fish pathogens and multiple antigens can be expressed in the same vector allowing for multivalent vaccines.

Application area

A recombinant fully attenuated Edwardsiella bacterial vector that can be used to immunize a wide variety of fish species against common diseases associated with aquaculture, including septicemia and white spot disease

Advantages

Enables vaccination of fish by bath immersion, minimizing handling time
Eliminates the need for anesthesia, electricity or needles, reducing labor and equipment costs
The attenuated Edwardsiella vaccine vector is versatile and can be used with a wide range of fish species and to immunize against a variety of different infectious diseases

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