

## A Drug Delivery Composition (NYP ID: 0438)

### Technology

A novel vaccine composition for immunizing farmed fish for protection against diseases caused by pathogenic bacteria

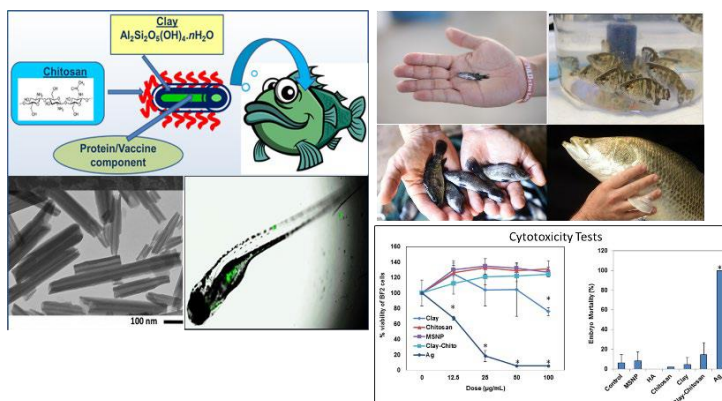
### Type of IP and status

Patent. Singapore Patent Application No. 10201502463T.

### Overview

Aquaculture is one the most proliferative agriculture industry owing to the increasing demand for fish products and decreasing wild catch. However, with intensive aquaculture, where stocks are kept in high density, often, microbial diseases emerged resulting in outbreaks leading to massive deaths. In the past antibiotics are used to treat the infections. But, due to its misuse, resistant microbes have emerged and are now rampant in killing stocks. Hence, nowadays, vaccines are very much preferred and are usually administered via a needle injection into the fish when they are at least  $\geq 10g$  in size.

The novelty of this technology lies in the vaccine formulation where bacterial antigens are isolated and encapsulated in nanoparticles. The composition consists of outer membrane proteins of pathogenic bacteria (antigen) loaded into hollow nanoparticles of clay that are surface-modified with chitosan molecules. In addition to vaccination, this nano-platform can also be adapted to deliver other molecules such as viral, parasitic or bacterial recombinant proteins, hormones, nutrients, minerals and antibiotics.



### Potential Applications

- Can be used to vaccinate fishes which are smaller in size e.g. < 10 g
- A platform technology that can be adapted for use in delivering antigens from bacteria, viruses and parasites
- Applicable for other materials such as recombinant proteins or DNA, hormones, nutrients, minerals, antibiotics for delivery into a large range of aquatic animals besides fishes

### Advantages

- Provides an alternative method for effective and easy vaccination
- Cost- effective
- Adaptable for use in delivery of a variety of antigens
- Applicable for a large range of aquatic animals such as crustaceans

### Technology & Licensing Enquiries

**Ms Diana Sutanto**

Tel: +65 6550 0344

Email: [diana\\_sutanto@nyp.edu.sg](mailto:diana_sutanto@nyp.edu.sg)

**Mr Joel Tan**

Tel: +65 6550 0146

Email: [joel\\_tan@nyp.edu.sg](mailto:joel_tan@nyp.edu.sg)

**Mr Johnathan Lim**

Tel: +65 6550 1972

Email: [johnathan\\_lim@nyp.edu.sg](mailto:johnathan_lim@nyp.edu.sg)