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Current status and advances of fish vaccines in Malaysia
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Abstract
Fish diseases have a significant negative influence on the Malaysian aquaculture industry. Since the 1980s, the sector has grown in size, which has resulted in a rise in the prevalence of infectious outbreaks affecting both freshwater and marine cultured fish species. Demand for commercially available fish vaccinations is predicted to increase as infectious disease outbreaks continue to occur. In Malaysia, aquaculture vaccine research and development (R&D) are still in its infancy, with most efforts concentrating on producing vaccines against bacterial infections, most notably streptococcosis, vibriosis, and motile Aeromonas septicemia. Despite several attempts, no homegrown vaccine has been effectively introduced into the manufacturing pipeline to date. At the moment, only three imported aquatic vaccines have received full permission, a far cry from the 314 and 60 vaccines licensed in the poultry and porcine industries, respectively. This review will describe recent findings regarding the development of aquaculture vaccines for certain fish species and diseases in Malaysia. In our opinion, R&D on fish vaccines is critical to the aquaculture industry's viability.

Author Keywords
Aquaculture; Fish; Fish diseases; Malaysia; Vaccine

Index Keywords
immunoglobulin A, recombinant vaccine, triacylglycerol, vaccine, virulence factor; Aeromonas, Aeromonas salmonicida, antibiotic resistance, Article, autophagosome, bacterial infection, bacteriophage, bacterium culture, Bifidobacterium bifidum, biofilm, epidemic, Epinephelus, exophthalmos, fish, fish disease, freshwater fish, gene deletion, herd immunity, humoral immunity, lamina propria, leishmaniasis, marine environment, Oreochromis niloticus, phagocytosis, prevalence, RNA interference, Salmo salar, septicemia, upregulation, vaccination, Vibrio harveyi, Vibrio parahaemolyticus, Vibrio vulnificus, vibriosis

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