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DISSERTATION TITLE:	*Development of new nanoparticulate vaccines against fish viruses in aquaculture*

A short lead paragraph written in Norwegian that summarizes the main findings in the thesis, no more than 2-3 sentences.

The purpose of this work was to investigate the potential of using nanoparticulate vaccine formulations to increase the antiviral vaccine effectiveness in aquaculture. A panel of Toll-like receptor ligands were tested for their ability to induce antiviral transcripts in Atlantic salmon macrophages, in a search for a potential adjuvant in the vaccine formulation. The responses to ligands were then compared to the responses induced by the infectious salmon anemia virus infections in the Atlantic salmon.

Our next step was to investigate whether the ISAV infection in Atlantic salmon induced unfolded protein response since it has been demonstrated that the infection of many viruses induce UPR activation. We discovered that although ISAV infection activated all three UPR induction pathways (ATF6, IRE1 and PERK) *in vitro*, it also induced GADD34, one of the main negative regulators of UPR.

Finally, we studied the adjuvant properties of free poly(I:C) and also used poly(I:C) stabilized with chitosan in a zebrafish vaccination trial. We discovered that the whole virus vaccine containing chitosan-stabilised poly(I:C) provided a significant protection against the subsequent viral hemorrhagic septicaemia virus infection. We also compared the protective effects of free poly(I:C) and chitosan encapsulated nanoparticulate poly(I:C) adjuvented vaccines using recombinant VHSV-G as antigen and discovered that all poly(I:C) adjuvented vaccines provided significant protection against VHSV infection.

Our results suggest that chitosan poly(I:C) is an interesting candidate for further investigation as an adjuvant in antiviral fish vaccines.