



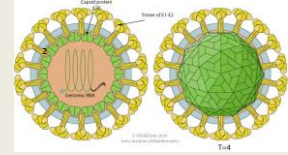
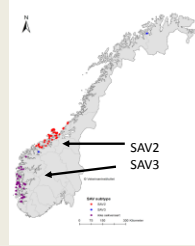
Salmonid alphavirus-replicon. A promising vaccine model for Atlantic salmon

Astrid Wolf¹, Azial Abdullah¹, Christel Olsen¹, Stine Braeen¹, Petter Frost²,
Stephane Villoing², Kjartan Hodneland², Espen Rimstad¹

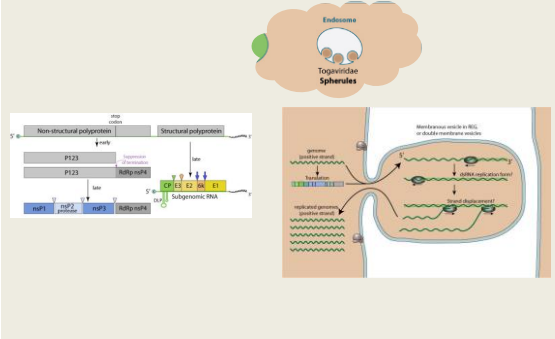
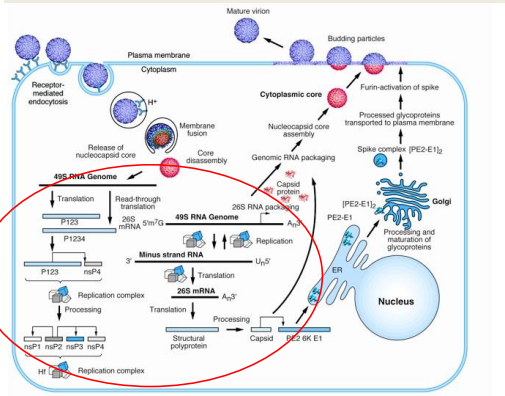
1 Norwegian University for Life Sciences
2 MSD – Animal health



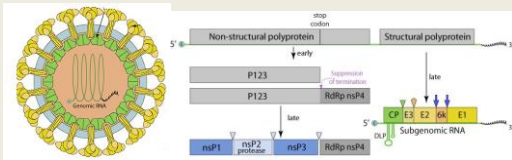
Salmon alphavirus (SAV) = Salmonid pancreas disease virus = (SPDV)



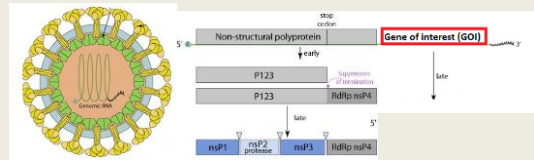
(SAV 1-6)



Replicon



Replicon



Replicon

Non-structural polyprotein: 5' -> [Non-structural polyprotein] -> Gene of interest (GOI) -> 3'

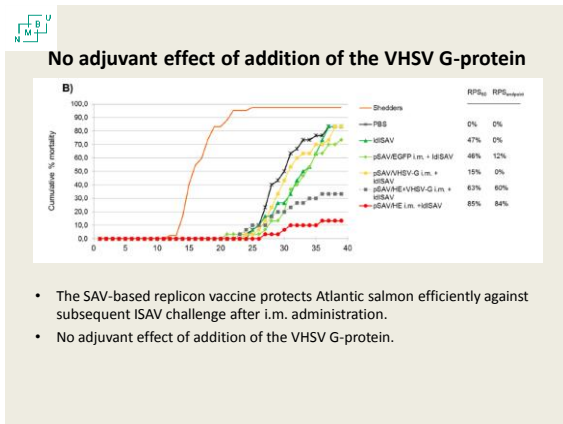
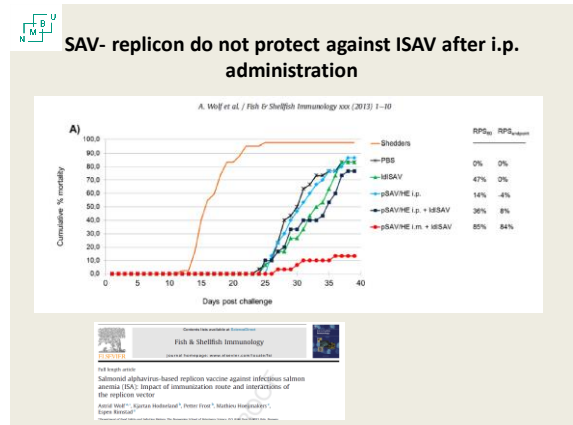
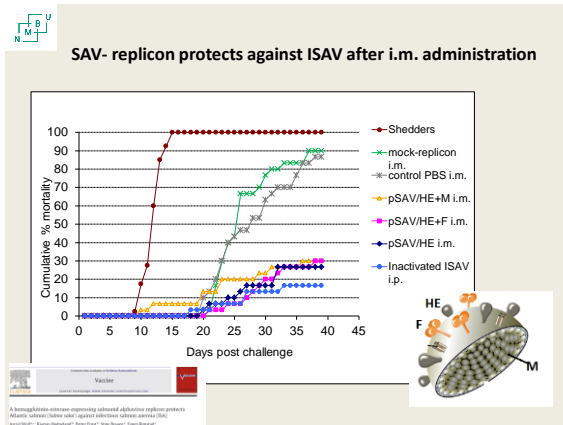
Transcription: early, late

Proteins: P123, RdRp nsP4, nsP1, nsP2, nsP3, RdRp nsP4, HE, F, M, EGFP

Alphavirus replicon vaccines

Compared to conventional vaccines:

- High antigen expression
- Immunogenic function of the replicon vector



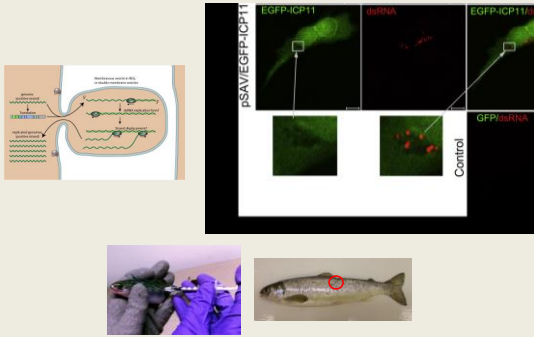
Basic properties- SAV3 replicon

Expresses in fish cells, mammalian cell, insect cells, shrimps

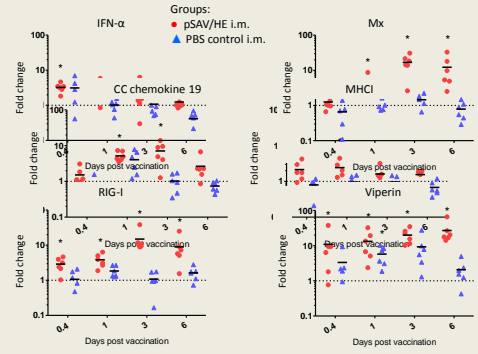
Large temperature range 4-37°C



Basic properties– SAV3 replicon



Muscle - immune gene transcript profiles

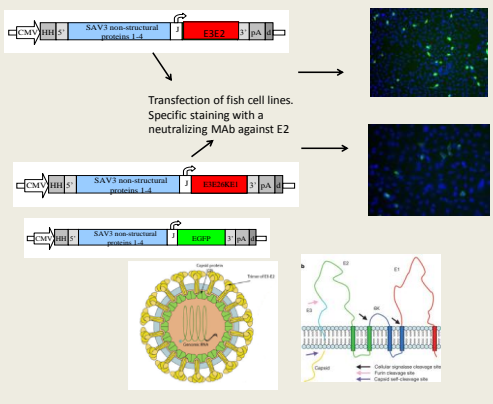
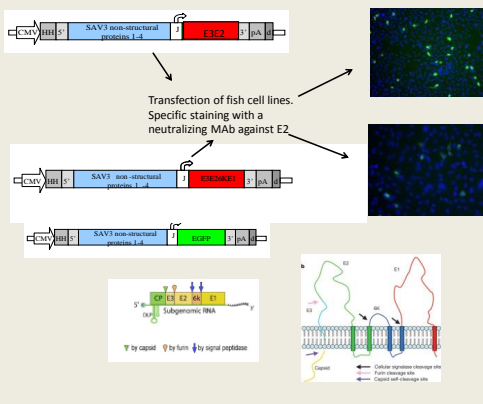
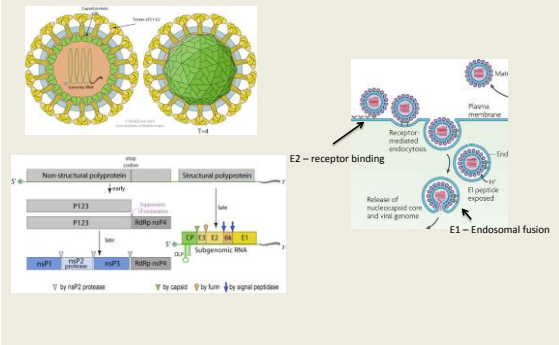


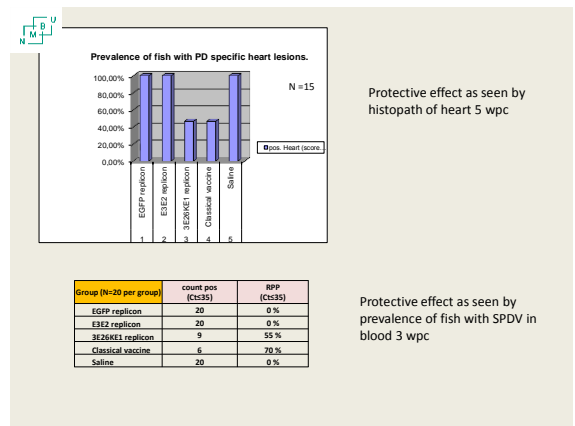
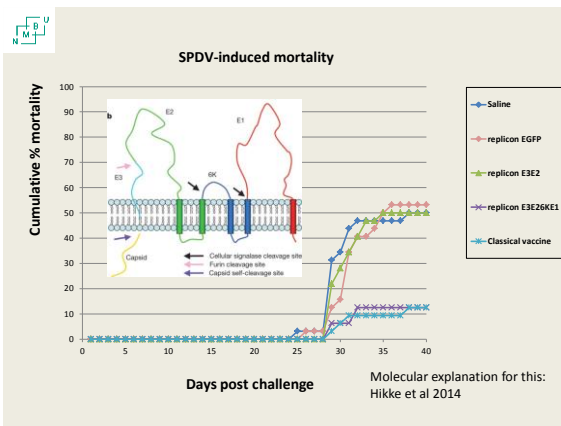
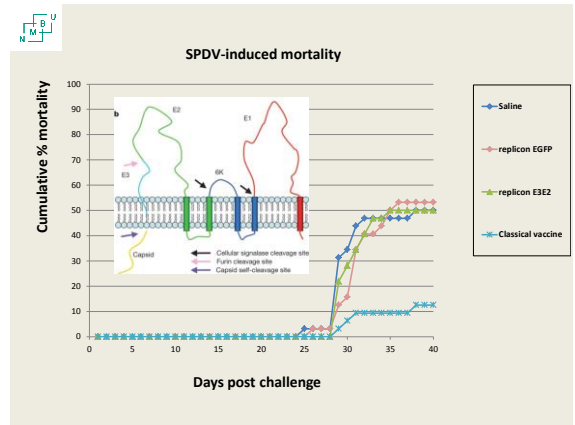
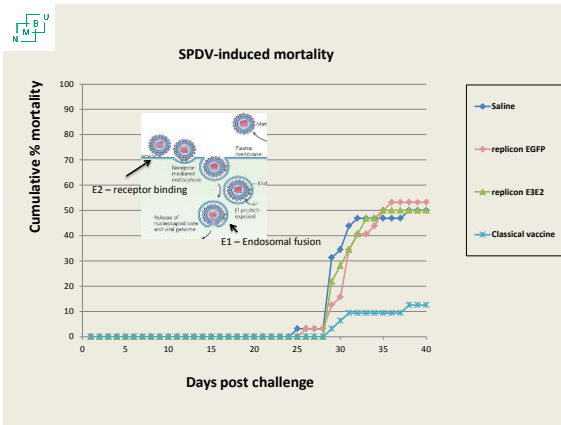
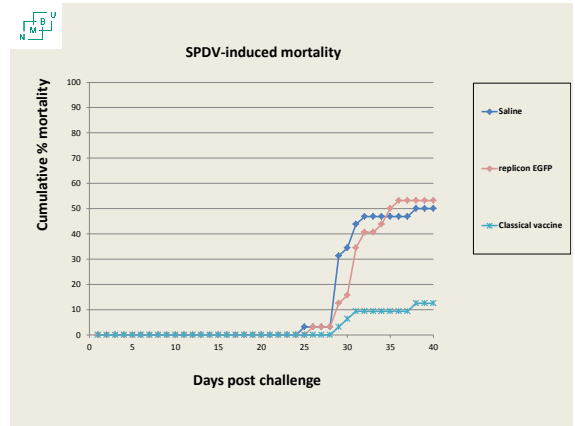
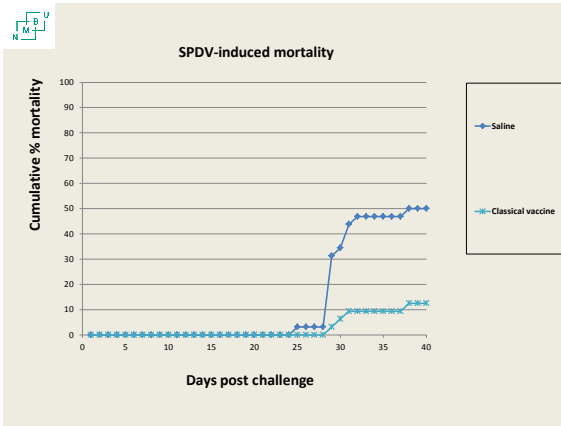
Expression of GOI – local immune response

- ➔ After cellular uptake the replicon replicates and expresses the gene it codes for at the muscle vaccination site.
- ➔ The replicon vaccine induces a strong innate immune response locally at the vaccination site.

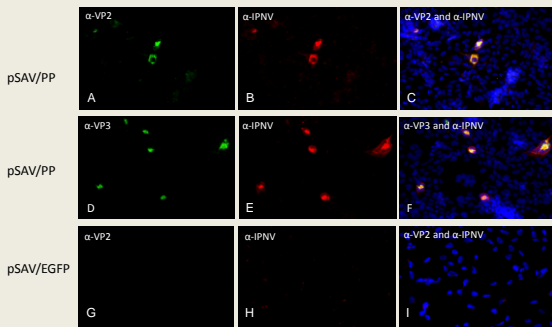
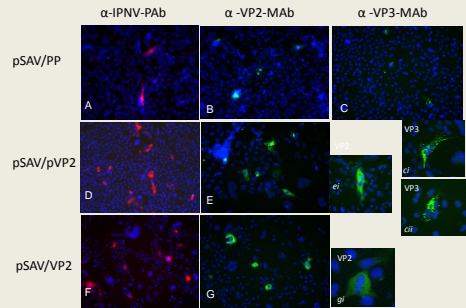
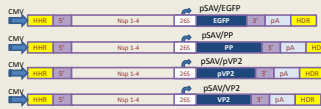


Challenge experiment SAV - replicon immunisation

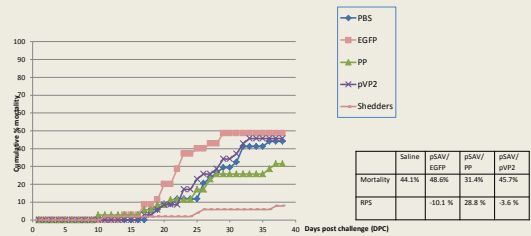




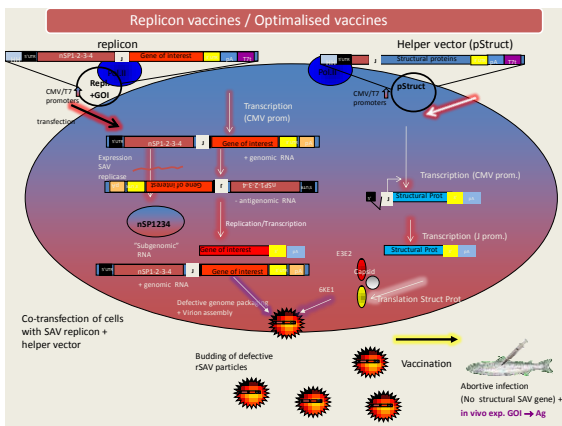
Challenge experiment IPNV - replicon immunisation



Challenge experiment IPNV - replicon immunisation



Very moderat protection against IPN with the replicon construct.



Conclusions

- SAV replicons are versatile vectors for expression (temp, species, phylum)
- Useful tool for studies of properties of virus proteins
- Strong inducers of innate immune response
- Shown to induce protection against ISA and PD
- No particular good protection against IPN
- Is protection dependent upon the pathogenesis of the disease and variation in pathways of viral replication?