Salmonid alphavirus subtype I isolated from clinically-diseased Atlantic salmon, *Salmo salar*, in freshwater culture

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Riaghaltas na h-Alba
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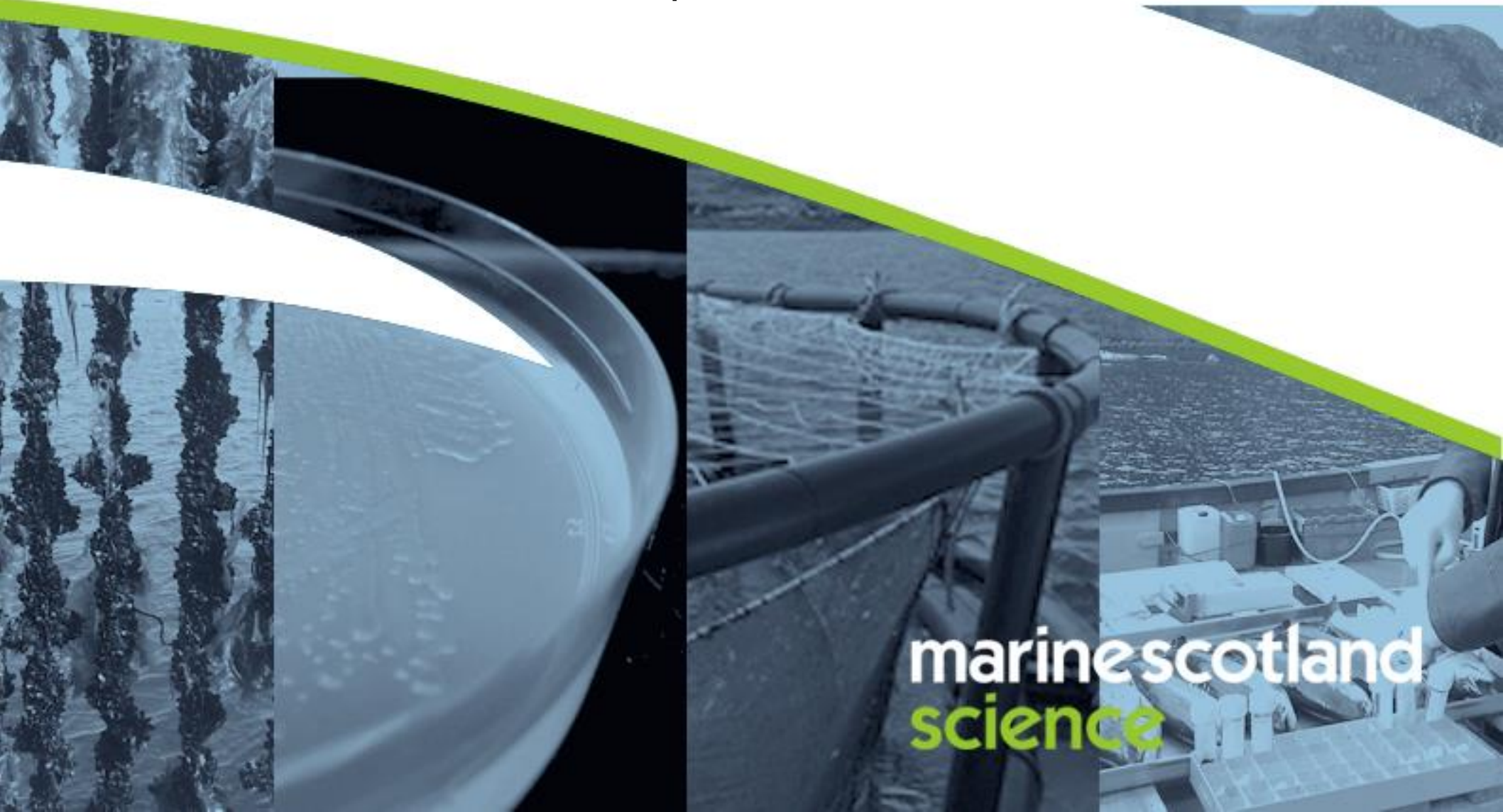

Introduction

- Pancreas disease (PD) is a disease of cultivated salmonids in seawater stage.
- PD was first diagnosed in the 1970s and first reported in Atlantic salmon, *Salmo salar*.
- The condition in rainbow trout, *Oncorhynchus mykiss*, was named as sleeping disease (SD) in France in 1994.
- PD causes mortality, carcass and fillet quality downgrade as well as treatment and management costs.

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Introduction

- PD is responsible for significant economic losses to the aquaculture industry in Ireland, Norway and Scotland.
- PD outbreaks may occur at any time of the year, however, the majority of clinical outbreaks are observed in the summer and autumn months.
- The mortality may range from minimal percentages to up 63 %.
- Pancreas, heart and skeletal muscle can be significantly affected with lesions.

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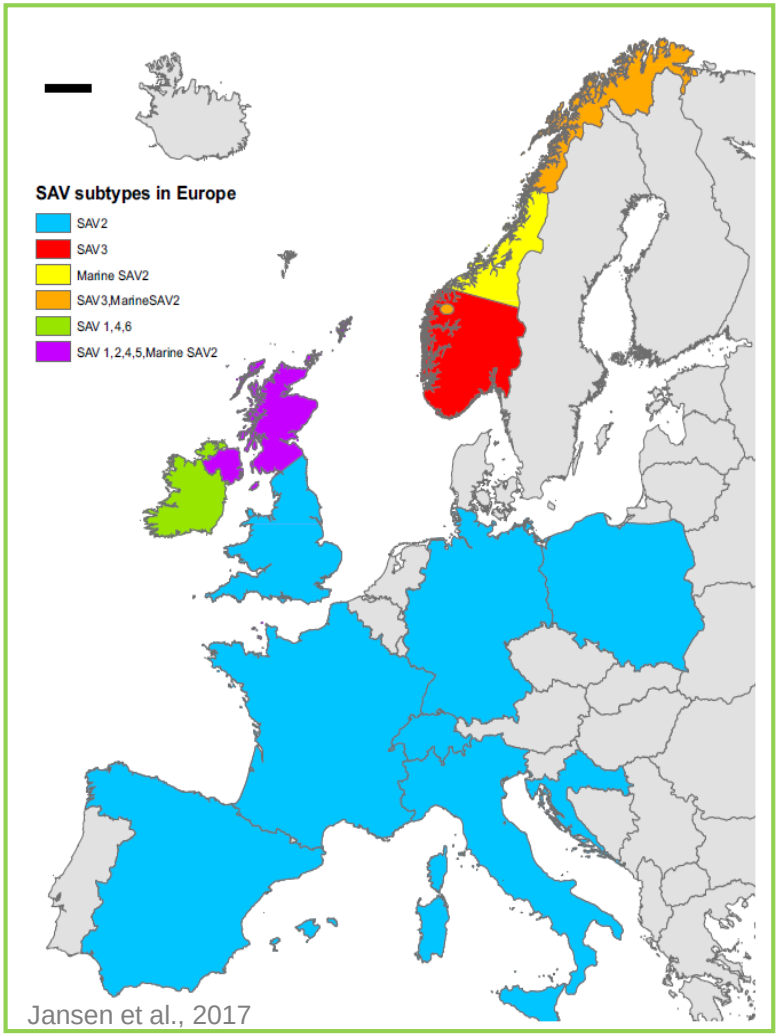
Introduction

- PD is caused by a single-stranded RNA virus.
- The virus belongs to the genus *Alphavirus* of the family *Togaviridae*.
- Commonly named salmonid alphavirus (SAV).
- The virus has been characterized into 6 genotypes with distinct geographic distribution.



Jansen et al., 2017

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Introduction

- Pancreas disease typically affects Atlantic salmon in the seawater stage.
- Sleeping disease typically affects in freshwater-reared rainbow trout.
- SAV infection and the clinical condition have been experimentally induced in the freshwater stages of Atlantic salmon

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Study aim

- **Describe the first report of SAV infection in A. salmon in freshwater stage.**

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Case description

- The hatchery facility is located on the west coast of Scotland less than one mile from a sea water loch.
- The loch contains several A. salmon aquaculture facilities.
- The fish were held in a recirculation system consisting of four tanks, however, only three tanks were populated with fish.
- The site was populated with approximately 1,400,000 S0 Atlantic salmon with a mean weight ranging from 10 to 16 g.

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Case description

- These fish were supplied by another hatchery as fry in May 2018.
- The Mortalities were reported as 2.16 % in week 21 and 11.67 % in week 22 and then decreased to 0.55 % in week 23.
- IPN outbreak was suspected from histology results.
- Water temperature raised to 21C for 48 hours to combat the suspected IPN outbreak.

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Case description

- **Five moribund fish were sampled for diagnostic proposes.**
  - Histopathology
  - Bacteriology
  - Molecular genetics
  - Virology

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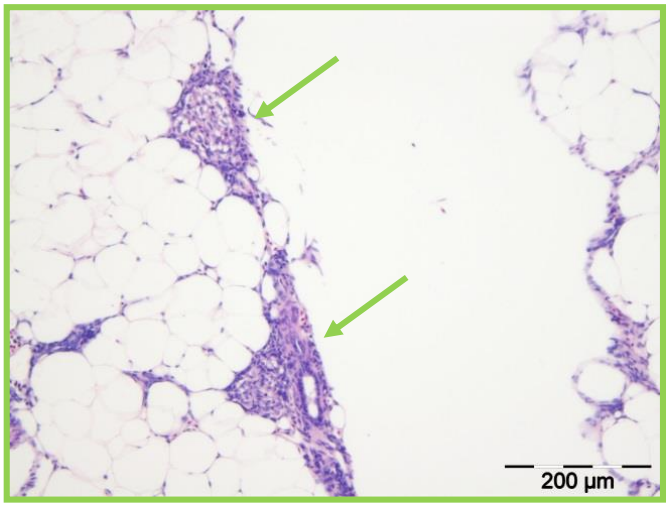
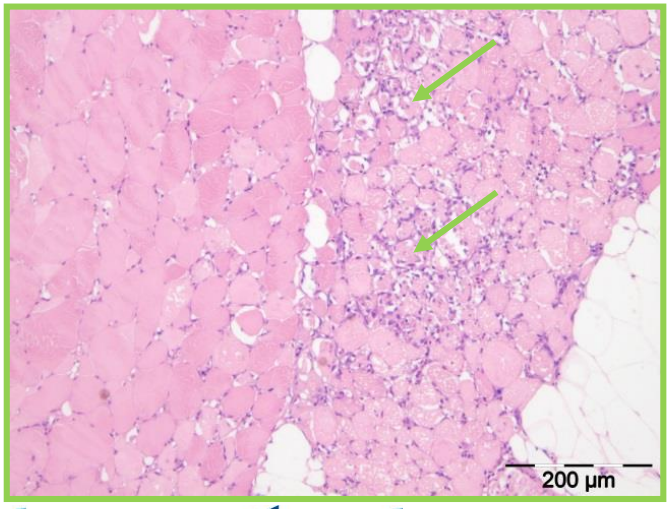
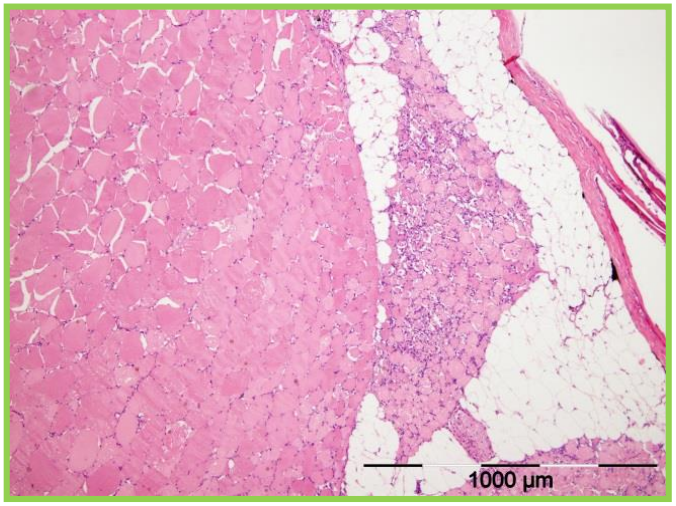
Results

- Histopathology







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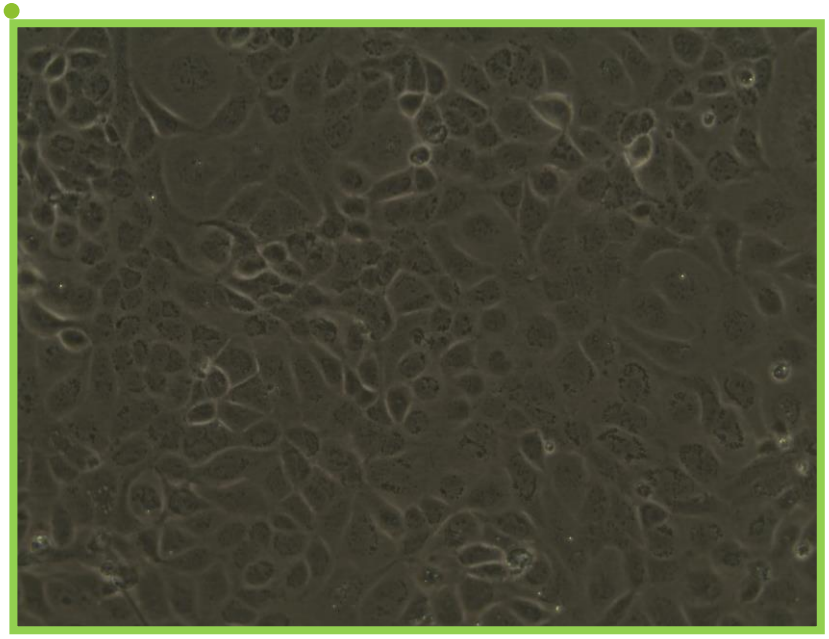
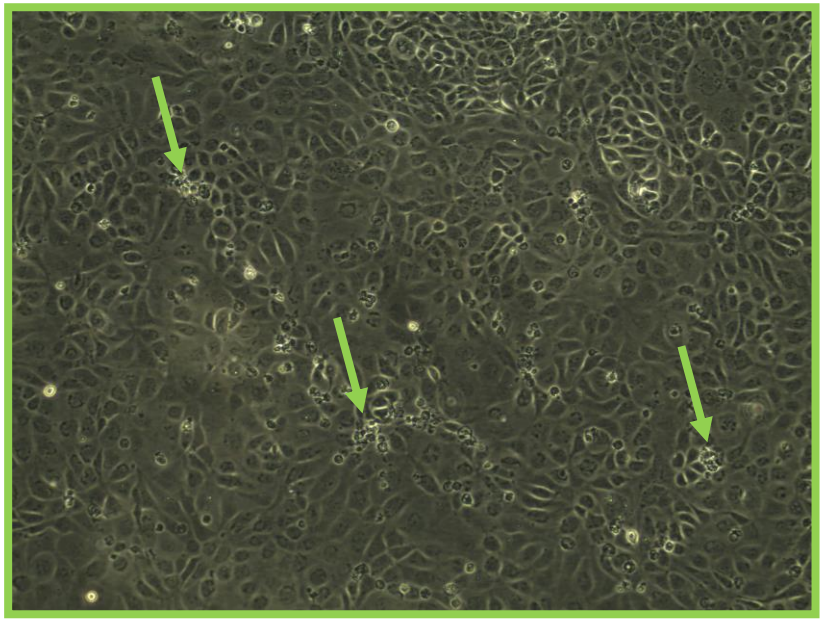
Results

- **Virology**
  - SAV virions were isolated from CHSE-214 cells and confirmed by qPCR



No cytopathic effect (CPE)



Mild cytopathic effect (CPE)

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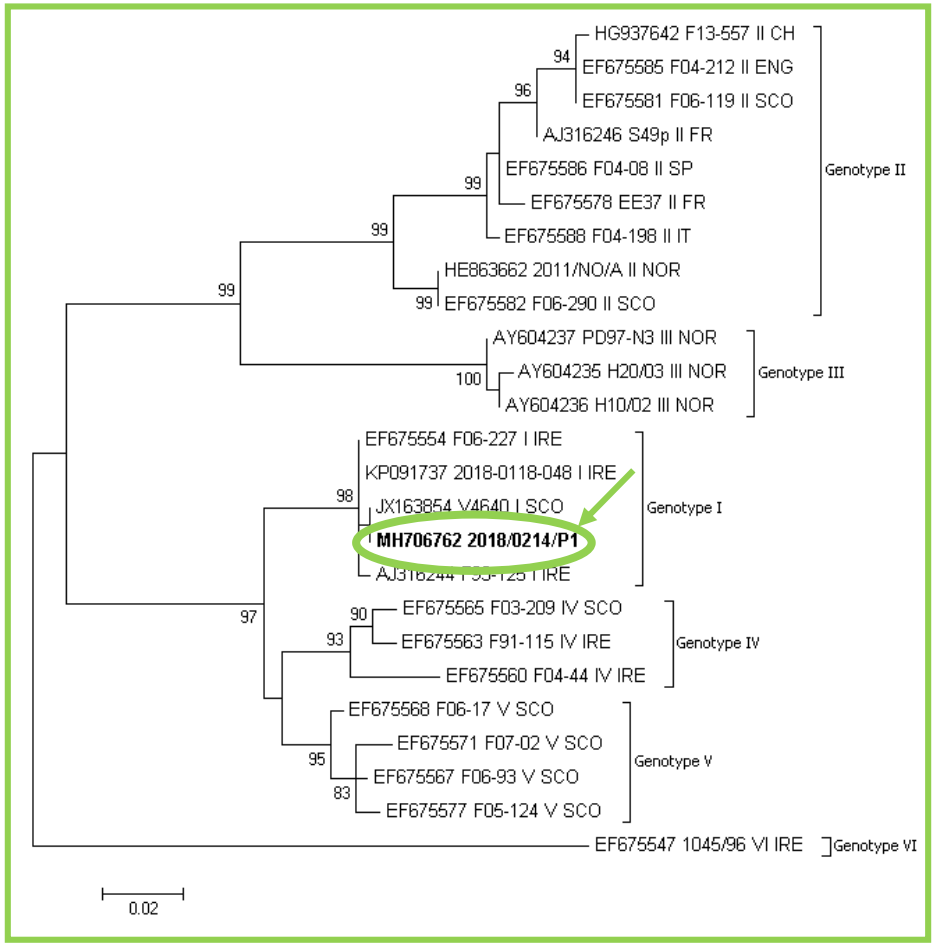
Results

- **Phylogenetic analysis of partial E2 gene sequences**



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Conclusions

- First description of a clinical field case of SAV with pathology consistent with PD in freshwater Atlantic salmon
- This case showed typical histopathological lesions of clinical PD in the pancreas, heart and skeletal muscle.
- The phylogenetic analysis of the virus places it in the subtype of SAV I.
- The virus is closely related to isolates previously reported in Scotland and Ireland.

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THANK YOU

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