Introduction to the family *Rhabdoviridae*  

### Eel rhabdoviruses – Why do we care?

- Eel rhabdoviruses are widespread in farmed and wild European eel (van Ginneken, 2004)
- Eel rhabdoviruses may cause a hemorrhagic disease and significant mortality in farmed European eel
- Eel rhabdoviruses have been suggested as one the of major causes of the European eel population decline (van Ginneken, 2005)

### Eel rhabdoviruses – What is the problem?

- Currently, several eel rhabdovirus isolates have been described
- The confusion about the classification of eel rhabdoviruses leads to:
  - Taxonomic ambiguity
  - Diagnostic difficulties
- How many viruses, how many strains?
  1. EVEX vs. EVA
  2. Rhabdoviral dermatitis
  3. Castric isolates

### 1. EVEX vs. EVA – First description

- *Eel virus American* (EVA)
- *Eel virus European X* (EVEX)
1. EVEX vs. EVA – Morphology / Infectivity

- Morphologically very similar
- CPE caused in RTG-2 very similar
- Pathogenic to rainbow trout, especially at higher temperatures

1. EVEX vs. EVA – Serology

- Morphologically very similar
- CPE caused in RTG-2 very similar
- Pathogenic to rainbow trout, especially at higher temperatures
- Serologically very similar (and distinct from VHSV / IHNV)
- Biochemical very similar (and distinct from VHSV / SVCV / VSV)

1. EVEX vs. EVA – Structural proteins

- RNA polymerase (L) > 191 kDa
- Glycoprotein (G) = 58 kDa
- Nucleoprotein (N) = 48 kDa
- Phosphoprotein (P) = 41 kDa
- Matrixprotein (M) = 28 kDa

1. EVEX vs. EVA – Gene sequences

- Comparison of partial RNA polymerase (L) gene sequences (2040 bp) showed 91.5% sequence identity between EVEX and EVA

1. EVEX vs. EVA – Gene junctions

Based on the gene junctions (potential stop and start sequences), EVEX belongs to the genus Vesiculovirus

1. EVEX vs. EVA – Taxonomy

Based on phylogenetic analysis of the N-gene, EVEX and EVA can be considered as two strains of a single virus species
2. Rhabdoviral dermatitis – First description
- Rhabdoviral dermatitis of Japanese eel (AM92)

2. Rhabdoviral dermatitis – Serology
- Rhabdoviral dermatitis of Japanese eel (AM92)
- AM92 is very similar to EVEX and EVA in morphology and serology

3. Castric isolates – First description
- Isolates B_{12}, B_{44}, C_{26}, C_{30}, and D_{13} are morphologically very similar
- EVEX, C_{30}, B_{44} and D_{13} are serologically very similar to EVEX
- B_{12} and C_{26} are serologically distinct

3. Castric isolates – Structural proteins
- C_{30}, B_{44} and D_{13} have a ‘vesiculovirus’ structural protein composition
- B_{12} and C_{26} have a distinct protein composition (similar to VHSV)
Summary

- Rhabdoviruses can be important pathogens in wild and farmed freshwater eels of the genus Anguilla
- EVEX, EVA and rhabdoviral dermatitis of Japanese eel are probably three strains of one eel vesiculovirus
- Castric isolates C30, B44 and D13 are different isolates of the EVEX strain of eel vesiculovirus
- B12 and C26 are most likely eel novirhabdoviruses
- Current research focuses on complete genome sequencing of EVEX, in order to confirm its taxonomic position within the genus Vesiculovirus

Acknowledgements

Dutch Central Veterinary Institute:
- Olga Haenen
- Ineke Roozenburg
- Michal Voorbergen
- Marc Engelsma

University of Perpignan:
- Richard Galinier

Wageningen University:
- Annette Boerlage
- Marco de Mik