Shallow Water Danger

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Signalment and Clinical History

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• After being restocked into the completed renovated pond in late September, all fish began developing skin lesions.
Normal Adult Skin

C = Club cell
G = Goblet cell

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Additional Diagnostics

- Transmission electron microscopy
- PCR targeting CyHV-1 Thymidine Kinase gene
CyHV-1 Thymidine Kinase Gene

PCR Results

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Diagnosis

- Cyprinid Herpesvirus-1 associated epidermal hyperplasia and dysplasia, with mild full thickness apoptosis and hydropic degeneration
• Complete genomic sequencing of CyHV-1
  • Identification of three unique neighboring ORFs (151C/D/E)
  • Partial sequence homology to DNA binding and dimerization domain of JunB transcription factor
• AP-1 transcription complex
  • Heterogenous family including factors \textit{JunB}, \textit{c-Jun}, \textit{junD}, \textit{c-fos}, \textit{FosB}, \textit{Fra-1}, and \textit{Fra-2}
  • Downstream targets include KGF and GM-CSF
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• Cutaneous lesions resolved by January following administration of 2-3 ppm of rock salt
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- Dr. Tom Waltzek (UF)
- Dr. Yuliya (Julia) Sokolova (LSU)
- Dr. Fabio Del Piero (LSU)
Questions?
Cyprinid Alloherpesviruses

- **CyHV-1** “Carp Pox”
  - Acute lethal systemic disease in fingerlings
  - Non-lethal proliferative cutaneous lesions in adults typically occurring during the winter

- **CyHV-2** “Goldfish Hematopoietic Necrosis Virus”
  - Epizootics in Spring and Fall associated with high mortality
  - All ages of goldfish affected

- **CyHV-3** “Carp Nephritis and Gill Necrosis Virus”
  - Epizootics in Spring and Fall associated with high mortality (OIE reportable disease)
  - All ages of common carp and koi affected
Order Herpesvirales

- Three families associated with distinct host groups
  - Alloherpesviridae
    - Infects fish and amphibians
  - Herpesviridae
    - Infects mammals, birds, and reptiles
  - Malacoherpesviridae
    - Infects mollusk

- Conserved biological processes, including virion structure, replication process, and ability to establish latent infections with recrudescence under stressful environmental conditions
Differential Diagnoses

- Protozoa
  - *Ichthyophthirius multifilis*
- Oomycyte
  - *Saprolegnia* sp.
- Viral
  - CyHV-1
  - Lymphocystis