

## Western Fisheries Research Center

### Piscine myocarditis virus

#### Key points

- Piscine myocarditis virus (PMCV) is a novel double-stranded RNA virus that groups within the family *Totiviridae*. PMCV is the causative agent of cardiomyopathy syndrome (CMS) in farmed Atlantic salmon from Norway. CMS has also been reported in Atlantic salmon from Scotland and the Faroe Islands. [1]
- CMS was first described in Norway in 1985 and a viral etiology was strongly suspected. CMS is diagnosed by histopathology of the heart. The signs include inflammation and degeneration of the myocardium in the atrium and the spongy layer of the ventricle. The cause of death is typically due to rupture of the atrium or sinus venosus. CMS typically occurs 12 to 18 months after seawater transfer of Atlantic salmon. [1,2]
- There have been unpublished reports of CMS in Pacific and Atlantic salmon from British Columbia (reported as unpublished work in [2]). Additionally, a condition similar but not identical to CMS was reported in farmed Atlantic salmon from BC [3]. PMCV was not known as the causative agent at the time of these reports so no testing for the virus was performed.
- Surveys of marine fish along the Norwegian coast line found no compelling evidence for a marine reservoir. A related but distinct strain of PMCV was found in a type of smelt (*Argentina silas*). [4]
- PMCV does not grow on standard cell lines but can be cultivated using the grouper fin (GF-1) cell line. [1]
- CMS is a differential diagnosis from Heart Skeletal and Muscle Inflammation (HSMI) disease of salmon. HSMI has been associated with Piscine reovirus (PRV), which is relatively ubiquitous in the Atlantic salmon industry. In contrast, PMCV is not ubiquitous and its presence is more clearly associated with CMS disease. [5]
- The global distribution of this virus is not presently known and there is limited characterization of strain diversity. Thus, if PMCV was found outside of European waters, it would be premature to make inferences regarding epidemiological linkages.
- There have been no reports of CMS in Pacific salmon and trout from either Alaska or Washington. The risk that this virus would pose to Pacific salmon is unknown. Viral isolation and controlled laboratory challenge studies would need to be performed to fully evaluate the risk.

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## References

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