

## RPC rolls out two new diagnostic services



In December 2008, RPC's Fish Health Laboratory led by Dr. Ben Forward (*pictured left*) completed validation of realtime RT-PCR assays for Infectious Salmon Anaemia Virus (ISAV) and Salmon Alphavirus (SAV).

Realtime RT-PCR (or PCR) assays do not simply detect the presence of a pathogen, but provide information on the quantity of pathogen present. Realtime assays are also more sensitive than conventional PCR-based methods (10-100x more sensitive in our validation work) allowing more effective surveillance of subclinical infections, wild stocks or putative carrier populations. Indeed, realtime assays have become the industry standard for nucleic acid based diagnostics, and in Scotland, Norway, and Chile they have replaced conventional PCR-based assays.

RPC's fish health lab is the only laboratory in New Brunswick offering this service to industry.

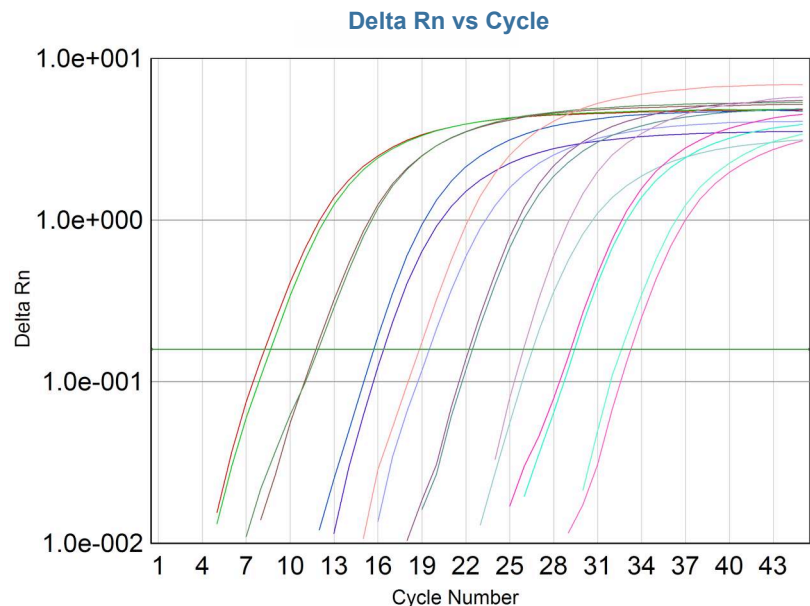
### Absolute realtime RT-PCR for ISAV

This assay, developed in part with funding from the NB Department of Agriculture and Aquaculture, uses an 'absolute' method of realtime amplification technology to determine the quantity of ISAV particles in a sample. In this assay, samples are run in duplicate alongside a standard curve containing known concentrations of synthetic ISAV allowing determination of the absolute concentration of ISAV in a sample. The assay can detect as few as 1-10 particles of ISAV in a sample.

### Absolute realtime RT-PCR for salmon alphavirus (SAV)

This assay was implemented in partnership with colleagues at the FRS Marine Laboratory in Aberdeen. The assay uses an absolute method of realtime amplification technology to determine the quantity of salmon alphavirus (SAV) particles in a sample. In this realtime assay, samples are run in duplicate alongside a standard 'dilution' curve of SAV standard.

To find out more about these assays, or how they can address your fish health screening needs, please call one of our fish health professionals or email us at [info@rpc.ca](mailto:info@rpc.ca).



## Emerging Pathogen Watch

Since identification of ISAV in the Bay of Fundy in 1998, RPC's fish health scientists and technicians have kept up with the literature and have worked closely with international colleagues to ensure they are well positioned to bring current advances (industry-standard diagnostics and information on emerging disease threats) to assist the Canadian aquaculture industry. For instance, RPC was the first laboratory to establish ISAV Hpr typing technology, and consequently was the first laboratory in Canada to identify the ISAV H0 (European) variant.



Dr. Rachael Ritchie

So, what are we watching for now?

### H0 (Canadian variant)

It is theorized that deletion variants of the segment 6 (HE) gene of ISAV arise from a full length progenitor termed the H0. To date only a European H0 variant (progenitor of European hpr 'deletion' variants) has been found. This molecular variant appears to be avirulent however as it has yet to be cultured and little is known of its stability or its relationship to the virulent 'deletion' variants. The North American H0 variant (progenitor of North American hpr 'deletion' variants) has not yet been identified.

We are on the look-out for the North American H0 variant and believe its identification will change the way ISAV is screened and managed in New Brunswick.

### Salmon alphavirus (SAV)

Pancreas Disease (PD) in Atlantic salmon has been recognized for many years, however, it is only recently (1995) that the causative agent, salmon pancreas disease virus (SPDV) has been identified. Initially, the disease was found primarily in smolts in first year at sea (July to Sept), and was associated with mild clinical signs. Nowadays outbreaks are seen in all stages of marine production, and the virus has been isolated from fresh and salt water with mortality ranges from 1-48%. The disease causes pancreatic failure which affects feeding and leads to skeletal muscle lesions. It can reoccur despite a fallow period suggesting a substantial reservoir of infection in sea water. The virus thrives in cooler waters like those found in Norway and Canada, and causes highest mortalities in high energy sites and when fish are returning to feeding after a period off feed.

Salmon alphaviruses have not yet been identified in New Brunswick however, given the stability of the virus in cool temperatures and the endemic nature of the pathogen in Europe, its appearance in Atlantic Canada may only be a matter of time.



## Technology

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### Fish Health Research Publications

The past year was a busy one for our Fish Health research efforts, resulting in scientific publications in leading journals including:

Ritchie et al., (2008) Comparative virulence of Infectious salmon anaemia virus (ISAV) isolates in Atlantic salmon (*Salmo salar* L.) *Journal of Fish Diseases* D01:10.1111/j.1365-2761.2008.00973x

McIntosh et al. (2008) Transferable, multiple antibiotic and mercury resistance in Atlantic Canadian isolates of *Aeromonas salmonicida* subsp. *Salmonicida* is associated with carriage of an IncA/C plasmid similar to the *Salmonella enterica* plasmid pSN254. *J. Antimicrobial Chemotherapy* 61:1221-8

McIntosh et al., (2008) Culture independent characterization of the bacterial populations associated with cod (*Gadus morhua* L.) and live feed at a research facility using Denaturing Gradient Gel Electrophoresis *Aquaculture* 275:42-50

Johnson et al., (2008) Association between ISAV mortalities and ISAV molecular type in the Bay of Fundy, Canada. *Can. Tech. Rep. Fish Aquat. Sci* 2782:iv+15pp

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