Skeptical of AquaBounty's salmon? Nature makes GM fish, too

A new study by Queen's University researchers Laurie Graham and Peter Davies finds "conclusive" evidence for the controversial idea that the antifreeze gene that helps rainbow smelt survive icy coastal waters originally came from herring and was somehow stolen by smelt about 20 million years ago.

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Closely related fish such as different types of smelt tend to have the same genes in the same order. And the researcher found that was the case — except for the antifreeze gene, which was found between two genes that are normally next to each other in other smelt.

"That's what you would expect when you have a gene that's just sort of been pasted into a genome through horizontal gene transfer."

Herring have certain transposable elements pasted hundreds of times all over their genome, including in and around their eight antifreeze genes.

When the researchers looked at the smelt's single antifreeze gene, it had three of those herring transposable elements attached, Graham said. "So it was like a little tag to say, 'Hey, I'm from herring.'" Those transposable elements weren't found anywhere else in the smelt.

The researchers say it's conclusive evidence that the antifreeze gene moved between the two fish via horizontal gene transfer and that it went from herring to smelt and not vice versa.

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