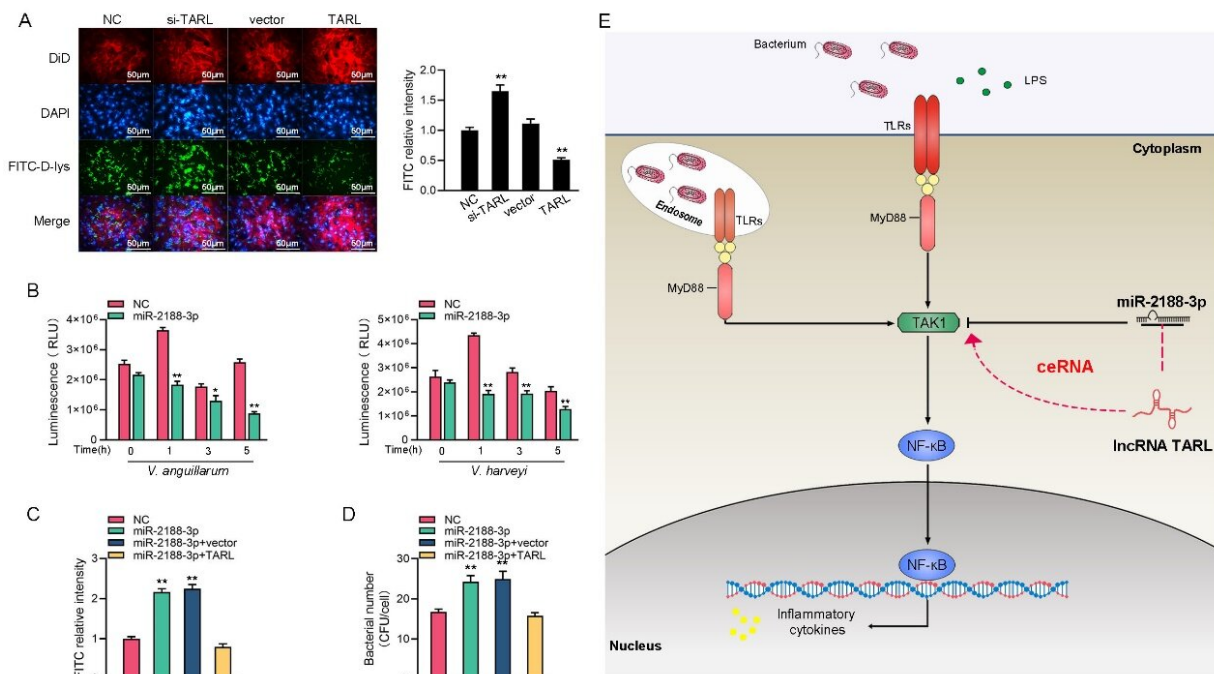


Long noncoding RNA TARL can help fish resist *Vibrio* infection by regulating the stability of TAK1

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TARL can competitively adsorb miR-2188-3p through the ceRNA mechanism and then promote TAK1-mediated antibacterial innate immunity in fish. Credit: Science China Press

In a study published in the journal *Science China Life Sciences*, Miichthys miiuy in teleost was taken as the research object to explore whether

lncRNA can play a regulatory role in the process of teleost resisting susceptible pathogenic *Vibrio* infection. And the researchers found that the expression of lncRNA TARL was up-regulated in the spleen tissue of *M. miiuy* stimulated by LPS.

Further analysis showed that lncRNA TARL can promote the expression of inflammatory cytokines, and can significantly promote the [host](#) to resist the invasion of *Vibrio anguillarum*, which indicates that lncRNA TARL can participate in the innate antibacterial immune response of *M. miiuy*, and can play a positive regulatory role. Nucleo cytoplasmic localization assay proved that lncRNA TARL is a cytoplasmic localization lncRNA.

Later, bioinformatics analysis, RNA immunoprecipitation, RNA pulldown and other assays confirmed that lncRNA TARL can directly interact with miR-2188-3p. miR-2188-3p has been proved to inhibit the innate immune response of *M. miiuy* against bacteria and promote the escape of *V. anguillarum* and *V. harveyi*. Further results showed that the seed sequence of miR-2188-3p inhibited the stability of TAK1 mRNA by combining with the 3'UTR region of TAK1 mRNA. Further research found that TAK1 was crucial for *M. miiuy* to resist *Vibrio* infection.

After down-regulation of TAK1 expression, the escape efficiency of *V. anguillarum* was significantly improved, which indicated that TAK1 was a very important node in the innate antibacterial immune response of *M. miiuy*. lncRNA TARL promotes the host's innate immune response by competing with TAK1 mRNA to bind miR-2188-3p, thereby helping the host resist the infection of *V. anguillarum* and *V. harveyi*.

This study provide new insights for understanding the impact of lncRNA on host immunity and bacteria escape and formulating fish disease prevention to resist severely harmful gram-negative [bacteria](#) infection. It was led by Dr. Tianjun Xu (Laboratory of Fish Molecular Immunology,

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More information: Weiwei Zheng et al, Long noncoding RNA TARL promotes antibacterial activity and prevents bacterial escape in *Miichthys miiuy* through suppression of TAK1 downregulation, *Science China Life Sciences* (2023). [DOI: 10.1007/s11427-022-2254-6](https://doi.org/10.1007/s11427-022-2254-6)

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