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Antiviral activity of transiently expressed mitochondrial antiviral signaling adapter, MAVS orthologue from Asian seabass

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Abstract

The innate immune signaling adapter, Mitochondrial antiviral signaling protein (MAVS) coordinates the signals received from two independent RLRs (RIG-1 and MDA5) to induce IFN & interferon stimulatory genes (ISGs). In the present study, we report identification of an orthologue of MAVS from *Lates calcarifer* (*Lc*MAVS) and its functional role in piscine RLR signaling. The *Lc*MAVS-cDNA was cloned into pcDNA and transfected into SISS cells. *Lc*MAVS was detected to be a 61 KDa protein in western blot. Confocal microscopy demonstrated the mitochondrial localization of *Lc*MAVS. In addition, pcDNA-MAVS transfected cells were protected against Nervous Necrosis Virus (NNV) infection as manifested by the delayed appearance of cytopathic effect (CPE) and decreased viral transcript levels. Ectopic expression of *Lc*MAVS resulted in activation of an ISRE-containing promoter (52 folds over control cells) as well as transcriptional expression of IRF-3, IFN-1 and IFN-inducible genes including Mx and ISG15 ($p<0.05$). These results suggest that *Lc*MAVS is involved in the antiviral immunity as one of the adaptors in fish IFN-activation pathway.

1. Introduction