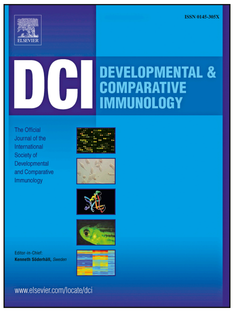

JAK and STAT members in channel catfish: Identification, phylogenetic analysis and expression profiling after *Edwardsiella ictaluri* infection

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Abstract

The Janus kinase/signal transducers and activators of transcription (JAK/STAT) signaling pathway is one of the main pleiotropic cascades used to transmit information from extracellular receptors to the nucleus, which results in DNA transcription and expression of genes involved in immunity, proliferation, differentiation, migration, apoptosis, and cell survival. Members of JAK family and STAT family have been extensively studied in different mammalian species because of their important roles in innate and adaptive immune responses. However, they have not been systematically studied among teleost fish species. In this study, five JAK family members and eight STAT family members were identified and characterized from channel catfish. Phylogenetic analysis was conducted to properly annotate these genes. Syntenic analysis was also conducted to establish orthology, and confirm the results from phylogenetic analysis. Compared to mammals, more members of the JAK and STAT family were identified in channel catfish genome. Expression of JAK and STAT family members was detected in healthy catfish tissues, but was induced in gill, liver, and intestine after bacterial challenge. Notably, the significant upregulation of STAT1b gene in catfish liver, gill and intestine after *E. ictaluri* infection supported the notion that high STAT1 expression are involved in defense against pathogens. Collectively, the increased expression of JAK and STAT members in tested tissues suggested their crucial function in defending the host against pathogen invasion.

Keywords

JAK/STAT signaling pathway; JAK; STAT; Catfish; *Edwardsiella ictalurid*, immunity