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Tumor necrosis factor receptor-associated factor 6 (TRAF6) from mud crab participates in anti-lipopolysaccharide factors (ALFs) gene expression

Tumor necrosis factor receptor-associated factor 6 (TRAF6) is a cytoplasm key signal adapter protein that mediates signals activated by tumor necrosis factor receptor (TNFR) superfamily and the Interleukin-1 receptor/Toll-like receptor (IL-1/TLR) superfamily. The full-length 2492 bp *Scylla paramamosain* TRAF6 (*Sp*-TRAF6) contains a 1800 bp of open reading frame (ORF) encoding 598 amino acids, including an N-terminal RING-type zinc finger, two TRAF-type zinc fingers and a conserved C-terminal meprin and TRAF homology (MATH) domain. Multiple alignment analysis shows that the putative amino acid sequence of *Sp*-TRAF6 has highest identity with Pt-TRAF6 (KP341006) from *Portunus trituberculatus* at 88%, while the similarity of other crustacea sequences was 54-55%. RT-PCR results indicated that the *Sp*-TRAF6 transcripts were predominantly expressed in the hepatopancreas and stomach, whereas it was barely detected in the heart and hemocytes in our study. Further, *Sp*-TRAF6 transcritripts were significantly up-regulated after immune challenge with *Vibrio parahemolyticus* or LPS. Our previous study had characterized two novel anti-lipopolysaccharide factor isoforms from *S.paramamosain* (*Sp*ALF5 and *Sp*ALF6). Both of them contain a conserved LPS-binding domain with two conservative cysteine residues, which is critical for their antimicrobial function. The *vitro* binding and antimicrobial activity assays indicated that the recombinant *Sp*ALF5 and *Sp*ALF6 protein generated from prokaryotic expression system showed a varying degree of binding activity towards bacteria and fungus, and exhibited a broad spectrum of antimicrobial activities against Gram-positive, Gram-negative bacterium and fungi. Therefore, six ALF isoforms from mud crab had been reported up to now. To investigate *Sp*-TRAF6 activating *Sp*ALFs gene expression, RNA interference assay was carrried out to examine the mRNA level of six *Sp*ALFs after silencing *Sp*-TRAF6 gene. The results showed that silencing *Sp*-TRAF6 gene could inhibit *Sp*ALF1, *Sp*ALF2, *Sp*ALF5 and *Sp*ALF6 expression in hemocytes, while *Sp*ALF1, *Sp*ALF3, *Sp*ALF4, *Sp*ALF5 and *Sp*ALF6 in hepatopancreas. Taken together, the acute-phase response to immune challenges and the inhibition of *Sp*ALFs gene expression indicate that *Sp*-TRAF6 plays an important role in host defense against pathogen invasion via regulation of ALF gene expression in *S. Paramamosain*.

Biography

Shengkang Li has completed his PhD from Sun Yat-sen University and Post-doctoral studies from IFREMER Centre de Nantes, France. He is the Principle Investigator of marine micro-organisms research group in Marine Biology Institute, Shantou University. He has published more than 30 papers in reputed journals and has been serving as a reviewer for many reputed journals.

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