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The shrimp hormone receptor acts as an anti-apoptosis and anti-inflammatory factor in innate immunity

Zhi Wang, Baozhen Sun, Fei Zhu



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1 **The shrimp hormone receptor acts as an anti-apoptosis and**  
2 **anti-inflammatory factor in innate immunity**

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4 **Zhi Wang, Baozhen Sun, Fei Zhu\***

5 *College of Animal Science and Technology, Zhejiang Agriculture and Forestry*  
6 *University, Hangzhou 311300, China*

7

8 \* Corresponding author: Dr. Fei Zhu

9 Tel: 86-571-88981127

10 Fax: 86-571-88981129

11 Email: zhufei@zju.edu.cn

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13 **ABSTRACT**

14 Previously, we found that the expression of several genes, including *HR*, varied in  
15 *Drosophila melanogaster* after white spot syndrome virus (WSSV) infection. In this  
16 present study, we further investigated the role of *HR* in Kuruma shrimp,  
17 *Marsupenaeus japonicus* and determined its anti-apoptosis and anti-inflammation role  
18 in the innate immune system. We successfully identified a partial sequence (866 bp in  
19 length) of the *M. japonicus* hormone receptor ligand binding domain  
20 (*mjHR\_LBD/mjHR*). The 5' end of *mjHR* was successfully obtained; the open reading  
21 frame (ORF) ran from 33 to 701 bp, and encoded a protein containing 222 amino  
22 acids. *mjHR* belonged to the ligand binding domain of hormone receptors, was most  
23 likely part of a nuclear hormone receptor, and shared a close evolutionary relationship  
24 with other arthropods, such as insects. *mjHR* was expressed predominantly in  
25 immunity tissues such as gills, hemolymph and the hepatopancreas. WSSV infection  
26 could cause the down-regulation of *mjHR*, while infection with *Vibrio alginolyticus*  
27 could cause significant up-regulation of *mjHR*. The expression of *mjHR* was knocked  
28 down by dsRNA expressed by an engineered LITMUS 38i-HR plasmid. Virus and  
29 bacteria challenge experiment showed that the mortality of WSSV-infected shrimps

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