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Lipopolysaccharide- and  $\beta$ -1,3-glucan-binding protein from *Litopenaeus vannamei*: Purification, cloning and contribution in shrimp defense immunity via phenoloxidase activation

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Lipopolysaccharide- and β-1,3-glucan-binding protein from *Litopenaeus vannamei*: purification, cloning and contribution in shrimp defense immunity via phenoloxidase activation Benjaporn Phupet, Thanawat Pitakpornpreecha, Nuntaporn Baowubon, Phanthipha Runsaeng, Prapaporn Utarabhand\* Department of Biochemistry, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla, Thailand \* Corresponding author. Tel/fax: +66 074 446656. *E-mail address:* prapaporn.u@psu.ac.th (P. Utarabhand). Keywords: Lipopolysaccharide- and  $\beta$ -1,3-glucan-binding protein (LGBP); *Litopenaeus vannamei*; Innate Immunity; Vibrio parahaemolyticus; White spot syndrome virus 

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