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Expression of *Macrobrachium rosenbergii* lipopolysaccharide- and β-1,3-glucan-binding protein (LGBP) in *Saccharomyces cerevisiae* and evaluation of its immune function

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ABSTRACT

Pattern recognition proteins (PRPs) activate the innate immune system in invertebrates, and lipopolysaccharide- and β-1,3-glucan-binding protein (LGBP) is an important PRP with various biological functions. Here, the open reading frame (ORF) of *Macrobrachium rosenbergii* LGBP (MrLGBP) was cloned into plasmid vector pHAC181, then integrated into downstream of the GAL1 promoter of *Saccharomyces cerevisiae* strain GAL1-ScRCH1 via homologous recombination, followed by its expression in the yeast eukaryotic system. The resulting recombinant LGBP contained a 3×HA-tag at its C terminus and had a molecular weight of about 45 kDa, as evaluated by western blot analysis. Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were ranged from 0.340 to 0.802 and 1.189 to 1.810 μM, respectively. The recombinant MrLGBP protein agglutinated almost all tested bacteria except *Bacillus thuringiensis* and *Staphylococcus aureus.* These results revealed that this recombinant protein exhibited antimicrobial activity against some Gram-positive and Gram-negative bacteria. *M. rosenbergii* prawns were fed with the recombinant yeast strain MrLGBP for 1 month and