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**요 지 집**

**ABSTRACT**

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- 장소 : 제주대학교 해양과학연구소

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## Genomic characterization, tissue distribution and immune response of clusterin from *Hippocampus abdominalis* (big-bellied seahorse)

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**● Background (or Objective) of This Study :** Clusterin (CLU) is a glycoprotein consists of two chains ( $\alpha$ - and  $\beta$ -clusterin) which is involved in several physiological and pathological states of cells. CLU has multifunctional activities such as extracellular chaperone function, immune modulation, and lipid transportation. Besides, CLU plays its role in various cell signaling pathways related to several diseases such as oxidative stress, proteotoxic stress, cell death and survival.

**● Methods :** The present study was carried out to characterize the homology of CLU found in *Hippocampus abdominalis* (designated as HaCLU). Immune response was evaluated by challenging with lipopolysaccharide (LPS) (Gram negative bacterial ligand), Polyinosinic:polycytidylic acid (Poly I:C) (Mimic of viral double stranded RNA), *Edwardsiella tarda* (Gram negative bacteria), and *Streptococcus iniae* (Gram positive bacteria). PBS was used as the control.

**● Results & Discussion :** The present study was carried out to characterize the homology of CLU found in *Hippocampus abdominalis* (designated as HaCLU). Immune response was evaluated by challenging with lipopolysaccharide (LPS) (Gram negative bacterial ligand), Polyinosinic:polycytidylic acid (Poly I:C) (Mimic of viral double stranded RNA), *Edwardsiella tarda* (Gram negative bacteria), and *Streptococcus iniae* (Gram positive bacteria). PBS was used as the control.

HaCLU contains an open reading frame (ORF) of 1389bp and its encoded 462 amino acids with a molecular weight of 51.28 kDa and the estimated isoelectric point of 5.41. In silico analysis shows the signal peptide of HaCLU exist in the region of first 29aa, while,  $\alpha$ - and  $\beta$ -clusterin domains were in 34-227aa and 228-455aa regions respectively. Pairwise sequence analysis results illustrated that HaCLU has 97.2% of identity and 98.9% of similarity with the amino acid sequence of CLU of *Hippocampus comes*. qPCR experiment which was done to investigate the tissue distribution pattern of HaCLU revealed that the highest expression was in the Liver tissue, followed by heart, spleen, and brain tissues. Furthermore, immune response was investigated by analyzing the mRNA expression of HaCLU in the liver tissue of *H. abdominalis* upon stimulation with LPS, Poly (I:C), *Edwardsiella tarda*, and *Streptococcus iniae* intraperitoneally. The qPCR results unveiled that HaCLU is upregulated in the liver tissue after the immunization with all the stimulants.

Taken together, this study exposed HaCLU may involve in immune regulation against pathogenic infection in *H. abdominalis*.

● **Reference** : CLU; Clusterin precursor; Homo sapiens (Human); CLU gene & Protein, (n.d.), 2021.

S.R. Matukumalli, R. Tangirala, C.M. Rao, Clusterin: Full-length protein and one of its chains show opposing effects on cellular lipid accumulation. Sci Rep., 7:41235, 2017.