

Recombinant sea bass Transferrin inhibits and kills *Vibrio anguillarum*

Dam Thi-minh-tho¹, Devriendt Bert², Bossier Peter³ and Vanrompay Daisy¹

¹ Laboratory of Immunology & Animal Biotechnology, Department of Animal Production, Ghent University, Coupure Links 653, 9000 Ghent, Belgium
E-mail: thiminhtho.dam@ugent.be

² Laboratory of Immunology, Department of Virology, Parasitology and Immunology, Ghent University, Salisburylaan 133, 9820 Merelbeke, Belgium

³ Laboratory of Aquaculture & Artemia Reference Center, Faculty of Bioscience Engineering, Ghent University, Coupure Links 653, 9000 Ghent, Belgium

Transferrin, a glycoprotein with molecular weight of 80 kDa, is considered to be a natural anti-microbial agent in fish due to its iron deprivation activity leading to growth reduction of bacterial pathogens. However, many bacterial pathogens, like *Vibrio anguillarum* have siderophore-dependent and/or siderophore-independent iron-acquisition systems allowing them to use iron for growth even in the presence of the iron binding, innate immunity related fish proteins like transferrin. In this study, recombinant European sea bass transferrin (Tf) was produced by transient transfection of COS-7 cells using pcDNA4::transferrin. Recombinant Tf was purified by column chromatography. Next, we showed that *Vibrio anguillarum*, which is the causative agent of vibriosis in aquaculture, was inhibited in its growth and was also killed by recombinant sea bass Tf. Recombinant Tf blocked the growth of both a virulent (V11) and a non-virulent (V14) *V. anguillarum* strain. Significant growth inhibition (OD measurements) of *Vibrio* (10⁶ CFU) was observed from 4 hours onwards in the presence of 0.5mg Tf per ml culture medium. Taken together, these findings add extra knowledge on our understanding of the anti-microbial activity of transferrin, which apparently is not only caused by iron deprivation but also due to direct contact with the bacteria.

Keywords: sea bass; transferrin; *vibrio anguillarum*