

Intestinal barrier of carp (*Cyprinus carpio* L.) during a cyprinid herpesvirus 3-infection: Molecular identification and regulation of the mRNA expression of claudin encoding genes

Publons ID	10894892
Wos ID	WOS:000314743600036
Doi	10.1016/j.fsi.2012.11.010
Title	Intestinal barrier of carp (<i>Cyprinus carpio</i> L.) during a cyprinid herpesvirus 3-infection: Molecular identification and regulation of the mRNA expression of claudin encoding genes
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Publish Date	JAN 2013
Journal Name	FISH & SHELLFISH IMMUNOLOGY
Citation	45
Abstract	<p>As a major part of tight junctions in the intestinal epithelium of vertebrates, claudin proteins are crucial to develop a selective permeable function and to maintain integrity of the barrier. The intestine has been reported as one of the targeted tissue of the cyprinid herpesvirus 3 (CyHV-3) or koi herpesvirus (KHV) which causes major disease problems in carp production worldwide. To analyse the impact of the disease on the epithelial barrier of the intestine, carp claudin encoding genes were cloned, their tissue expression was described, and the abundance of gene transcripts in the intestine of carp under CyHV-3 infection was determined. Some of the carp claudin genes such as claudin-7 and -11 were expressed in various tissues, whilst others, like claudin-2 and -23, showed more tissue-specific expression profiles, which may reflect specific functions of these particular claudins. Along the gut axis, a spatial distribution of claudin gene expressions was found, with a lower abundance of gene transcripts in anterior regions of the intestine and increased expression in the distal section of the intestine, which might indicate specific functions of different regions in the intestinal tract of carp. In carp under CyHV-3 infection, an up-regulation in the expression of IFN-α2, IL-1 beta and iNOS was observed, together with an elevation of transcriptional levels of claudin-2, -3c, -11, and -23. The data suggest that expression of claudins is involved in the reorganisation of the intestinal epithelium in CyHV-3-infected carp, which may be responsible for changes in the paracellular permeability. An increased expression of the claudins might be a response to the disturbance of the hydromineral balance in carp under CyHV-3 infection. (c) 2012 Elsevier Ltd. All rights reserved.</p>
Publish Type	Journal
Publish Year	2013
Page Begin	305
Page End	314
Issn	1050-4648
Eissn	1095-9947
Url	https://www.webofscience.com/wos/woscc/full-record/WOS:000314743600036
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