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Spleen tyrosine kinase from Nile tilapia (*Oreochromis niloticus*): Molecular characterization, expression pattern upon bacterial infection and the potential role in BCR signaling and inflammatory response

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2 **Molecular characterization, expression pattern upon bacterial**
3 **infection and the potential role in BCR signaling and inflammatory**
4 **response**

5 **ABSTRACT**

6 Spleen tyrosine kinase (SYK), a member of non-receptor tyrosine kinase family,
7 plays an important role in immune responses against pathogen infection, which is
8 capable of activating B cells signaling pathway and regulating inflammatory response.
9 In this study, Nile tilapia (*Oreochromis niloticus*) ortholog (*OnSYK*) was identified
10 and characterized at expression pattern against bacterial infection, function in B cells
11 activation pathway and inflammatory response. The cDNA of *OnSYK* ORF contained
12 1851 bp of nucleotide sequence encoding polypeptides of 616 amino acids. The
13 deduced *OnSYK* protein was highly homologous to other species SYK, containing
14 two SH2 domains and a TyrKc domain. Spatial mRNA expression analysis revealed
15 that *OnSYK* had wide tissue distribution and was highly expressed in the liver. After
16 challenge of *Streptococcus agalactiae* (*S. agalactiae*) *in vivo*, mRNA expression of
17 *OnSYK* was significantly up-regulated in the head kidney, spleen and liver. The
18 up-regulation of *OnSYK* transcript was also displayed in the head kidney and spleen
19 leukocytes stimulation with *S. agalactiae* and LPS *in vitro*, which was confirmed at
20 protein level in the head kidney leukocytes by FACS analysis. In addition, after
21 induction with mouse anti-OnIgM monoclonal antibody *in vitro*, the expressions of
22 *OnSYK* and its downstream molecules (*OnLYN*, *OnBLNK* and *OnAP-1*) were

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