



## Only small fractions of soluble $\beta$ -glucan modulate the mucosal immune system in carp (*Cyprinus carpio* L.)

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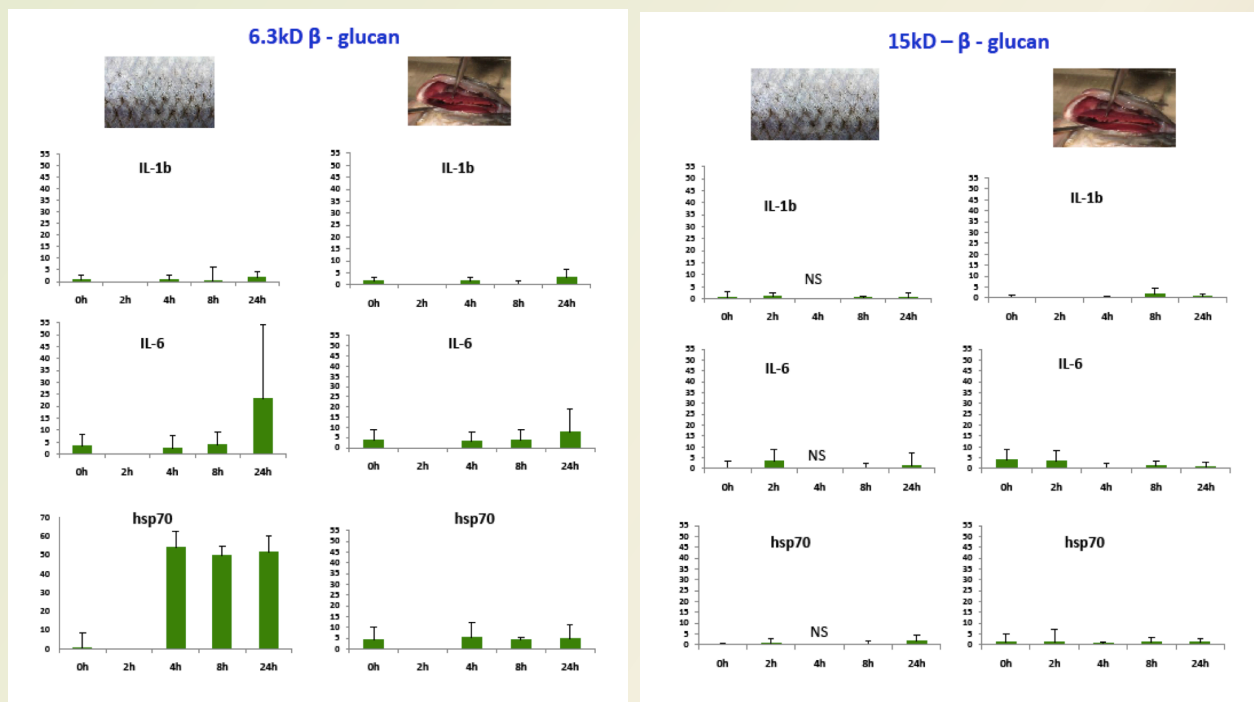
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## Introduction

$\beta$ -glucans are well known for their ability to modulate the piscine immune system. The discrepant effects of different origins and solubility of  $\beta$ -glucans on immune function possibly relates to factors as administration route, molecular weight and water solubility.

## Results



**Fig. 1a** Water - soluble unbranched 6.3kD  $\beta$ -glucan.

**Fig. 1b** Water - soluble unbranched 15kD  $\beta$ -glucan.

Expression of interleukin 1 $\beta$  (IL-1 $\beta$ ), interleukin 6 (IL-6) and heat shock protein 70 (hsp70) in skin and gill collected from juvenile carps. Fish were immersed with soluble  $\beta$ -glucan (1 $\mu$ g/ml) for 0h, 2h, 4h, 8h and 24h. Results are obtained by RQ-PCR and expressed relative to control at each time point and corrected for 40S expression. NS – no samples.