2015
CFAI 8th Special Lectures

" Fish immunology: innate immunity forms a solid basis for adaptive immunity "

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Date : Dec. 11th (Fri.), 2015
Time : 13:00 – 14:30
Venue : Lecture room No. 2
(Graduate School of Agricultural Science)

Toll like receptors (TLRs) are a group of receptors mainly present on innate imunne cells and found in many different fish families, with a conserved signalling domain but a non-conserved leucine-rich repeat ectodomain, hindering predictions of ligand specificities of fish TLRs based on sequence information only. Changes of gene expression may provide (in)direct evidence for the involvement of a particular TLR in the recognition of a pathogen. Functional studies, however, are required before conclusions on ligands specific to fish TLRs can be drawn. Macrophages are known to express TLRs and have the capacity to display different activation states after stimulation with bacterial ligands. Microbial ligands induce the development of innate activated macrophages whereas classically-activated macrophages can be induced by co-stimulation with recombinant IFNγ. Both types of macrophages show elevated phagocytic activity, expression of pro-inflammatory cytokine genes and, in particular, nitrogen radical production. Arginase enzyme activity appears the most reliable marker for the presence of alternatively-activated macrophages which are typically found in anti-inflammatory and wound-healing environments. Yeast-derived ligands such as β-glucans could possibly induce innate immune memory, independent of the macrophage phenotype, although this requires future studies designed to specifically investigate the phenomenon of trained immunity in fish.

(These lectures are included in Class 2(2) of International Food & Agricultural Immunology Lecture, 2015 and are also highly recommended for Master course students)