Analysis of Toll-Like Receptor Expression in Xenopus laevis Macrophage Subsets

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Macrophages (Mfs) of the amphibian Xenopus laevis are morphologically and functionally distinct; depending on whether they are differentiated by the colony stimulating-factor-1 (CSF-1) or interleukin-34 (IL-34) growth factors. Notably, while CSF-1 Mfs are highly susceptible to the Frog Virus 3 (FV3) ranavirus (etiological contributor to the amphibian declines), IL-34 macrophages exhibit potent anti-FV3 capacities. We hypothesized that these Mfs-FV3 susceptibility differences could be due to a difference in the gene expression of toll-like receptors (TLRs), a family of pathogenic pattern recognition receptors. Accordingly, we isolated RNA from control and FV3-chellenged CSF-1 and IL-34 Mfs, converted this RNA into cDNA and, using quantitative polymerase chain reaction (qPCR) examined the gene expression of TLRs 2, 3, 4, and 7 in these cells. Our results indicated that IL-34 Mfs express higher levels of all examined TLRs compared to CSF-1 Mfs. More importantly, the IL-34 Mfs specifically increased their expression of antiviral TLRs (3 & 7) in response to FV3.

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