

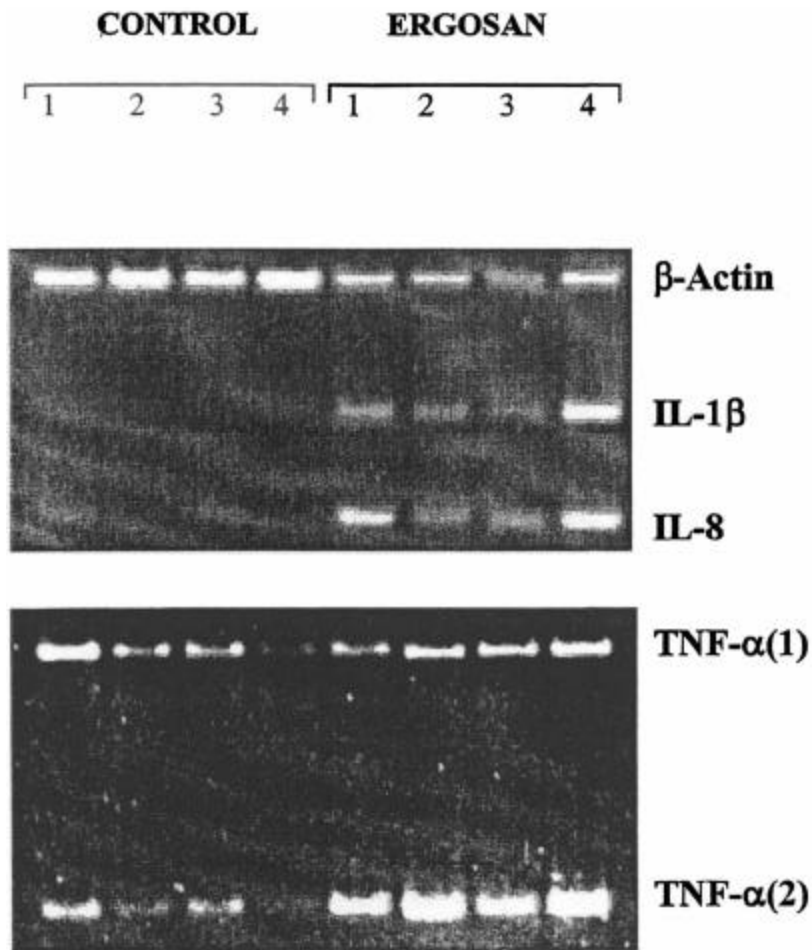
Effects of Ergosan on the Immune Response/Immune Function of Rainbow Trout

Work conducted in the department of Zoology, University of Aberdeen under a BBSRC Studentship sponsored by AVL has shown that AquaVac* Ergosan can have a wide range of effects on the immune system and thereby a stimulatory effect on the immune response when administered intraperitoneally to rainbow trout.

These effects include:

- **Migration of and thus increase in the numbers of leucocytes into the peritoneal cavity following intraperitoneal injection. That leucocytes migrate quickly into the injection site is an important prelude to the initiation of a multifaceted immune response.**
- **The overall composition of leucocytes in the peritoneal exudates was also significantly altered as a consequence of Ergosan administration, with neutrophilic leucocytes being increased and macrophages decreased. Although the role of the neutrophils in inflammation is still a topic of debate, it is likely that they are major players in phagocytic and respiratory burst-mediated bactericidal activity.**
- **A significantly greater proportion of elicited leucocytes, harvested from fish injected with Ergosan exhibited phagocytic activity. The phagocytic process is an important mechanism for the destruction of extracellular pathogens in fish.**
- **Intraperitoneal administration of Ergosan resulted in a 40-fold increase in the number of nitroblue tetrazolium (NBT) positive cells in the peritoneal cavity. Thus Ergosan can activate neutrophilic leucocytes bringing about this enhanced activity.**
- **Ergosan induces the expression of cytokine (IL-1 β , IL-8 and TNF- α) genes in the elicited peritoneal leucocytes of rainbow trout. Thus, Ergosan can now be added to the list of substances that stimulate the expression of these important cytokines and this could have profound effects on the stimulation and regulation of the immune response in general and anti-viral activity in particular.**
- **Classical complement activity in trout plasma was significantly enhanced after IP injection of Ergosan.**

In conclusion, the immunostimulatory property of the intraperitoneally injected Ergosan has been demonstrated in rainbow trout. The effects include stimulation of the migration of leucocytes into the peritoneal cavity, augmentation of neutrophil/macrophage activation, as evidenced by increases in phagocytosis, NBT reduction, cytokine gene expression and elevation of complement levels.



Real-Time-PCR analysis of cytokine gene expression in peritoneal leukocytes isolated from control fish injected (intraperitoneally) with PBS and Ergosan treated fish (1mg intraperitoneally).

β-Actin, IL-1β, IL-8, TNF 1 and TNF 2 expression is visualised on a 2% agarose gel.

Note enhanced expression of IL-1β, IL-8 and TNF 2.