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C-REACTIVE PROTEIN AND HOST DEFENSE
MECHANISMS OF RAINBOW TROUT

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The role of C-reactive protein (CRP) in the host defense was investigated in the rainbow trout. The amount of CRP in serum was measured by sandwich enzyme-linked immunosorbent assay using C-polysaccharide (CPS-ELISA). Significant increases of CRP levels were observed in sera after the inoculation of *Escherichia coli* lipopolysaccharide or bacteria (*Aeromonas salmonicida*) into fish. Furthermore, an increase of water temperature to 20°C also resulted in an increase of CRP levels. Turpentine oil and physiological saline, however, did not increase the CRP levels of rainbow trout sera.

Activation of the complement system by CRP was examined by a complement fixation test using rabbit hemolysin-sensitized red blood cells. Purified CRP enhanced the consumption of rainbow trout complement (activated the complement system) in the presence of CPS. Contrary to this, acute phase serum (APS) directly activated the rainbow trout complement. Activation of the complement system by APS was not observed when CRP was removed from APS by affinity chromatography. These results indicated that rainbow trout CRP is involved in the activation of the complement system of rainbow trout, and that APS contained factors that react to CRP and activate the complement system.

In the presence of complement, *in vitro* growth of *Vibrio anguillarum* was suppressed by APS or by CRP and CPS, indicating the suppression of bacterial growth by the activated complement system.

Phagocytosis of *V. anguillarum* by glass-adherent cells from peritoneal cells of rainbow trout was enhanced when purified CRP or APS was added to the cultures. Normal rainbow trout serum, however, was also noticed to enhance phagocytosis of the glass-adherent cells.

The results of the present experiments indicated that the CRP of rainbow trout plays an important role in host defense during acute phase response through the activation of the complement system.