

## OVOTRANSFERRIN AS AN AVIAN ACUTE PHASE PROTEIN AND ITS IMMUNOMODULATORY FUNCTION

Rath NC

*Agricultural Research Service, Poultry Science Center, University of Arkansas, Fayetteville, USA*

Acute phase proteins (APP) are humoral components of natural immunity elicited in response to physical, chemical, or infection-induced physiological injuries. The functions of these proteins are to recognize and protect the organism against invading pathogens, and restore physiological homeostasis. Although a substantial body of literature exists with respect to several mammalian APPs and their diagnostic potential, such information are limited in birds. To understand the avian acute phase response, we experimentally induced inflammation in broiler chickens by (1) endotoxin and bacterial cell wall administration and (2) croton oil. An analysis of serum protein patterns between 24-48 h after injection showed a consistently up regulated 65kD-band protein in birds with inflammation. Using a 2D gel and protein sequencing we identified the protein to be conalbumin also called, ovotransferrin (oTF). A commercially available anti-chicken transferrin antibody was used to develop a competition ELISA for ovotransferrin and measure its time course changes in blood during croton oil-induced inflammation and after viral and bacterial infections of SPF birds. Ovotransferrin levels were increased to different degrees under different infections. Transferrins are antibacterial proteins that relates to their iron sequestering properties. To find whether ovotransferrin has other functions beyond its anti-bacterial efficacy, we examined its effects on phagocyte functions using HD11 macrophage and avian peripheral blood heterophil cultures. Ovotransferrin upregulated interleukin-6, nitric oxide, and matrix metalloproteinase production and stimulated respiratory burst activities. Macrophages required priming by phorbol myristate acetate, a protein kinase C activator, to stimulate their respiratory burst activities. Heterophils did not produce nitrite in response to oTF treatment but showed degranulation as measured by the loss of granules and increase in myeloperoxidase release. Most stimulatory activities were limited to concentrations above 100 ug/ml. Despite small conditional differences in immunostimulatory effects of oTF on macrophages and heterophils, the results suggest that oTF may be a natural immunomodulator which protects the organism not only by its direct action against bacteria but by upregulating other defense systems.