Chemokine mRNA Expression in the Cecum of Chicks Infected with *Salmonella enteritidis*

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Summary and Implications

Two chemokines were expressed in the cecum at higher levels in *Salmonella enteritidis* (SE)-infected chicks than in uninfected chicks. These chemokines are known to attract macrophages and influence migration of these immune cells to the site of infection. Understanding organ-specific immune response of young chickens will provide novel insights into strategies like vaccine development or host genetics aimed at reduction in SE contamination of poultry products.

Introduction

Salmonella enteritidis is a bacterial pathogen that colonizes the gastrointestinal tract of chickens, is associated with production losses and, perhaps more importantly, is a major source of contamination of poultry products. Understanding the immune response of chickens to SE infection will be beneficial in decreasing contamination in the human food chain.

Materials and Methods

Day-old chicks from two advanced intercross lines were orally infected with SE or control broth (approximately 60 chicks were infected, 30 chicks were given control broth). One week after infection, the birds were euthanized and organs were removed. Total RNA was isolated from frozen cecal samples and assayed for gene expression. Using quantitative RT-PCR, we examined the following genes: CXCLi1, CXCLi2, Gallinacin-2, IFN-gamma, IL-1beta, IL-6, IL-12alpha, and IL-12beta.

Results and Discussion

Salmonella enteritidis infection in chicks resulted in the enhanced expression of two chemokines in the cecum (Figure 1), but none of the other tested genes. The cecum is a section of the gut in which bacteria grow, and there is also a high concentration of immune cells. These two genes (CXCLi1 and CXCLi2), similar to IL-8 in humans, play a role in cellular migration of immune cells. Our results suggest that chemokines play an important role in the host immune response to SE infection in young chicks. Studies of gene expression in response to infection may provide a better understanding of the immune responses of chickens to SE, and lead to new directions to control microbial contamination of poultry products.

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Figure 1. Effect of *Salmonella enteritidis* infection on mRNA expression in the cecum of chicks.