Changes in the expression of Avian β-defensin (AvBDs) in the intestine of broiler embryo and chicks during their growth.

T. Terada1, T. Nii1,2, N. Isobe1,2, and Y. Yoshimura1,2.

1*Graduate School of Biosphere Science, Hiroshima University, Higashi-Hiroshima, Japan.*

2*Research Center for Animal Science, Hiroshima University, Higashi-Hiroshima, Japan.*

Abstract

The intestine is one of the organs which have high risks of pathogenic microbe invasion. Avina β-defensins (AvBDs) are antimicrobial peptides that have antimicrobial activity involved in innate immuno-defense system. Fourteen AvBDs have been identified in chicken. Therefore, AvBDs may play roles in the innate defense-system in the intestine of embryos and newly-hatched chicks. However, the AvBDs expression profiles and it regulation in the intestine are not yet known. The aim of this study is to determine the changes in the expression and localization of AvBDs in the intestine of broiler embryos and chicks during their growth. The ileum and cecum of embryonic days 19 (ED19), day-old (D0) and 7-day-old (D7) chicks were collected for real time PCR and immunohistochemistry. The gene expression levels of 10 AvBDs (AvBD1 to 8, 10 and 12) were analyzed by real time PCR, and the localization of AvBD2 was examined by immunohistochemistry. The results showed that the gene expression levels of AvBD1, 2, 4, 6 and 7 were higher at ED19 than D7, and the gene expression levels of AvBD8 and 10 were higher at D0 than ED19. The AvBD2 positive cells were localized in the lamina propria beneath the epithelial cells of villi and crypts. The number of positive cells in the mucosa of cecum was higher at D0 than ED19 and D7. These results suggest that AvBDs are expressed and synthesised for immuno-defense system in embryos and newly-hatched chicks, and their expression may decrease with growth of chicks.