CRPS Current Research in Poultry Science

OPEN ACCESS

News

The Significant Differences in Transcription of the *Fyn-related kinase* (FRK) and *Ephrin A1 receptor* (EphA1) Genes

David I. Onyemachi

An excellent model for finding the genes governing humoral immune responses in chickens is provided by the high (HAS) and low (LAS) antibody lines developed through selection for antibody responses to sheep red blood cells, a thymus-dependent antigen. Finding and describing B-cell differentiation processes in the embryonic bursa is the long-term objective. Between embryonic days 15 (ED15) and 18 (ED18), a key differentiation event that coincides with the start of repertoire formation through immunoglobulin (Ig)-gene conversion has been identified by phenotype analysis and functional research. Surveying gene expression in the bursa at ED15 and ED18 to find candidate genes for regulating the transition from one developmental stage to the next is one strategy for achieving this goal.

Numerous developmental processes, including control of cell survival, migration, and differentiation, are known to be regulated by the RTK genes. Determining the complete set of RTK genes expressed in the bursa at ED15 was the aim of this work. Both the Virginia High (HAS) and Low (LAS) antibody lines produced fertile eggs. At ED15, bursae were removed from the embryos and stored in RNAlater tissue solution. From each of the control groups (HAS and LAS) and each of the testosterone propionate-treated groups, four bursae were pooled.

Based on nucleotide sequence similarities, the RTK gene cDNAs were split into 10 subfamilies for the HAS and LAS lines, and the Audic-Claverie Distribution test was used to assess the significance of the difference in the number of cDNAs found between the two lines. The liver and kidney have the highest expression levels of the FRK gene in mammals, which is only expressed in epithelial tissues. Because glioma tumours express considerably less FRK protein than healthy brain tissue, FRK serves as a tumour suppressor in the mammalian brain. The EGFR and erbB2 heterodimer would likely be expressed in the forming bursal epithelial cells, according to this research. The amount of EphA1 gene cDNAwas not significantly affected by testosterone propionate therapy.

This study determined whether chicken lines chosen for high or low antibody response to SRBC expressed RTK and nRTK genes differently in the developing bursa. The differentiation and structure of the epithelium in the developing bursa may be influenced by the variance in FRK and EphA1 gene expression that results from this genetic selection. The cell types that express the FRK and EphA1

genes, as well as the microanatomical variations in bursal development between different chicken lines, will need to be further investigated.

Article Reference

Nikhil Nuthalapati, Tyler A. Burks, Paul B. Siegel, Robert L. Taylor, Jr and Gregory T. Pharr, 2021. Protein tyrosine kinase gene expression profiles in the embryonic bursa of Fabricius of chicken lines selected for high and low antibody responses. Int. J. Poult. Sci., 20: 173-178.

KEYWORDS

Bursa of Fabricius, receptor tyrosine kinase genes, high antibody line, low antibody line, *fyn-related kinase* genes