

News & Comments

Role of the Leukocyte Protein in a Primary Lymphoid Tissue

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Prebursal stem cells, also known as committed B-cell progenitors, express surface IgM when the bursa is colonized between Embryonic Day (ED) 8 and ED 14.

The embryonic mesenchyme is crossed by the pre-bursal stem cells as they move into the stratified epithelial lining at the bursal lumen-mesenchyme barrier. Currently, it is uncertain what bursal follicular microenvironmental elements govern the selection, growth, and initiation of bursal B-cells as well as Ig-gene diversity. Our team aimed to pinpoint the regional cues that direct B-cell differentiation in the embryonic bursa. The bursa of the chick embryo also contains myeloid cells that express the LECT2 gene. LECT2 is a pleiotropic cytokine that has a variety of roles in development, homeostasis, and immunological function in mammals. This study set out to confirm the mRNA and protein levels of LECT2 gene expression in the embryonic bursa.

Fertile eggs from the F1 cross of the 15I5 and 71 highly inbred White Leghorn lines were obtained from the USDA/ARS Avian Disease and Oncology Laboratory. Ten bursas were pooled as replicates for the protein profile study, as previously mentioned. At the Mississippi State University Institute for Genomics, electrospray ionization tandem mass spectrometry was used to assess whole bursal protein lysates. Three biological replicates were used for the analysis of all samples. The housekeeping gene GAPDH was used to standardize the expression levels of all LECT2 mRNA.

In a previous study from our group, we discovered LECT2 protein peptides in the bursa 3 weeks after hatching cells during the proteomics analysis. However, the expression of the LECT2 gene at the protein level in the embryonic bursa has not been studied. When compared to later stages of B-cell development, LECT2 gene transcripts showed that LECT2 sequence reads were three times greater early in B-cell development (ED16) (ED19). In areas of granulopoiesis in the embryonic pancreas and spleen, LECT2 mRNA was found. Before hatching, myeloid lineage cells in the thymus and bursa were shown to express LECT2 mRNA. Alternatively, LECT2 may affect B-cell development indirectly by binding to nonlymphoid bursal Reticular Epithelial Cells (REC), which may lead to the production of differentiation factors produced from REC.

Due to LECT2 multifunctionality and high level of gene expression at a crucial stage in embryonic bursal B-cell development, we believe it to be a possible factor in the bursal microenvironment that



may contribute to B-cell maturation.

JOURNAL REFERENCE

Balazs Felfoldi, Hui Wang, Nikhil Nuthalapati, Robert L. Taylor, Jr., Jeffrey D. Evans, Scott L. Branton and Gregory T. Pharr, 2020. Expression of chicken leukocyte cell-derived chemotaxin 2 in the embryonic bursa of fabricius. *Int. J. Poult. Sci.*, 20: 43-47.

KEYWORDS

Bursa of Fabricius, B-cell, leukocyte cell-derived chemotaxin 2, chick embryo, protein level

