

Development of B cells in the chicken gut-associated lymphoid tissue

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It is well known that chicken B cells develop in the bursa of Fabricius (BF), which is categorized as gut-associated lymphoid tissue (GALT). Chicken GALT also includes Peyer's patch (PP) and cecal tonsil (CT). The relationship between these tissues in GALT during B cell development is currently unknown. In this study, comparative examination of PP, CT and BF development during embryogenesis was performed.

Chapter 1 describes the background and purpose of the present work. In Chapter 2, development of GALT in the normal chicken embryo was observed. On day 13 of embryogenesis (E13), accumulation of MHC class II⁺ cells was observed in the intestine. Thereafter, Bu-1⁺ cells and IgM⁺ cells appeared, and their number continuously increased at the same sites where MHC class II⁺ cells were present. Similar results were obtained in the CT. The locations of embryonic PP were limited to two sites; near the Meckel's diverticulum and the ileocecal junction. Anlage of bursal follicles first appeared at E13 and developed thereafter. Immigration of Bu-1⁺ cells to bursal follicles began at E13, and the number of Bu-1⁺ cell subsequently increased. These results indicate that the development of PP and CT start during late embryogenesis at the same time as the follicle of BF

In Chapter 3, the origin of B cells in PP and CT was analyzed. Even the follicle of BF was eliminated from the embryo by treatment with testosterone, development of PP and CT were observed. This means that appearance of surface IgM⁺ cells in PP and CT is independent from the development of the follicle of BF.

In Chapter 4, diversity of immunoglobulin variable region in BF, CT and PP was analyzed. B cells in PP but not in those in BF and CT did not use gene conversion to make a diversity of immunoglobulin. This means that some of B cells develops in PP, but those B cells do not have the diversity in immunoglobulin.

This thesis indicates the valuable information about the extra-bursal development of B cells.

Key words: chicken, B cell, development, Peyer's patch, bursa of Fabricius