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TRIBUTE TO BURSA OF FABICIUS – WHAT IS THE MODERN IMMUNOLOGY’ DEBT TO THE BIRDS?

Summary

Attribution by Bruce Glick in the fifties/sixties of twenty century an essential role of the bursa of Fabricius in the differentiation of a particular lymphocyte population in the chicken was a milestone in the modern immunology development. Incoming studies on both avian and mammalian experimental models were able to prove a functional dissociation of the humoral and cell-mediated immune response and to demonstrate that the bursa of Fabricius plays an important role in antibody production. Subsequently, the research was oriented towards the identification of the mammalian “bursa-equivalent” where the antibody-producing lymphocytes, named B-cells in the honor to the bursa of Fabricius, should be generated. Finally, this role in mammals has been proven for the embryonic liver and for the bone marrow lymphopoiesis in the postnatal life. Apart from that, bursa of Fabricius is an endocrine organ producing several peptides exhibiting immunoregulatory activity, not only towards the avian immune functions but also influencing mammalian immunity, both *in vivo* and *in vitro*. The most important among them seem to be: bur-sin (tripeptide discovered as the first bursal peptide), BASP (bursal anti-steroidogenic peptide, exerting and inhibitory effect on the steroid hormone synthesis in the ovarian follicles and adrenal cortex) and bursopentin (BP5, a peptide with an antioxidative properties). The anatomical features of the domestic chicken immune system, such as lack of lymph nodes, eosinophils or resident lymphocytes, may indicate the simplicity of its organization. In addition, the sequencing of the domestic chicken genome has shown that many immune processes in birds may occur with a more scant repertoire of cytokines, chemokines, receptors and costimulatory molecules than those found in mammals. However, this simplification is only apparent because the avian immune system fulfills all the functions as those of the mammalian one.

Key words: birds, bursa of Fabricius, avian immune system, chicken genome, bursal peptides