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MOLECULAR CLONING OF CHICKEN T LYMPHOCYTE SURFACE ANTIGENS

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In mammals, the surface glycoproteins, CD4 and CD8, define different functional subset of T lymphocytes and may act as recognition molecules mediating appropriate interactions between T cells and their targets.

The chicken represents an excellent model to study the development of both T and B lymphocytes, since each population develops in a distinct organ, i. e. the thymus and bursa respectively. The development and functions of chicken T lymphocytes however, have not been investigated as extensively as in mammals. Recently in this laboratory, the monoclonal antibodies Lc-4 and Lc-6 have been established, recognizing molecules equivalent to mammalian CD8 and CD4 antigens respectively, based on their tissue distribution and biochemical properties.

In this study, the cloning of chicken CD4 and CD8 genes was attempted using these monoclonal antibodies. A cDNA library was constructed with the CDM8 expression vector from chicken thymocytes, poly (A)-containing RNA, by the method of Aruffo and Seed, introduced into COS1 cells, and then the cells expressing the Lc-6 antigen were isolated by cell sorting with the monoclonal antibody Lc-6. The cDNAs of these positive cells were then extracted by the method of Hirt and reintroduced to *Escherichia coli*. The colonies were screened by cDNA probes prepared from MSB1 cells, which belong to chicken lymphoblastoid cell line derived from Marek's disease. The cDNAs of colonies which hybridized with the MSB1 probes were introduced into COS1 cells, allowing the expression of Lc-6 antigen to be determined by indirect immunofluorescence. One out of thirteen transfectant clones was positive. The size of the DNA insert in this clone was 1.9 kbp. This gene, encoding the Lc-6 antigen, was shown not to be rearranged by genomic blot analysis. The sequencing of the DNA from this clone is now in progress. An attempt to clone the Lc-4 antigen coding gene using the same cloning procedures was unsuccessful. The cloning and analysis of genes coding T cell antigens should contribute to the understanding of the evolution of the immune system of the chicken.