Epitope mapping of avian influenza M2e protein: different species recognise various epitopes

Abstract

A common approach for developing diagnostic tests for influenza virus detection is the use of mouse or rabbit monoclonal and/or polyclonal antibodies against a target antigen of the virus. However, comparative mapping of the target antigen using antibodies from different animal sources has not been evaluated before. This is important because identification of antigenic determinants of the target antigen in different species plays a central role to ensure the efficiency of a diagnostic test, such as competitive ELISA or immunohistochemistry-based tests. Interest in the matrix 2 ectodomain (M2e) protein of avian influenza virus (AIV) as a candidate for a universal vaccine and also as a marker for detection of virus infection in vaccinated animals (DIVA) is the rationale for the selection of this protein for comparative mapping evaluation. This study aimed to map the epitopes of the M2e protein of avian influenza virus H5N1 using chicken, mouse and rabbit monoclonal or monospecific antibodies. Our findings revealed that rabbit antibodies (rAbs) recognized epitope [6]EVETPTRN[13] of the M2e, located at the N-terminal of the protein, while mouse (mAb) and chicken antibodies (cAbs) recognized epitope [10]PTRNEWECK[18], located at the centre region of the protein. The findings highlighted the difference between the M2e antigenic determinants recognized by different species that emphasized the importance of comparative mapping of antibody reactivity from different animals to the same antigen, especially in the case of multi-host infectious agents such as influenza. The findings are of importance for antigenic mapping, as well as diagnostic test and vaccine development.