Genetics and Molecular Research

Detection of Jaagsiekte sheep retrovirus in the peripheral blood during the pre-clinical period of ovine pulmonary adenomatosis

Y. Liu[1], Y.F. Zhang[1], X.L. Sun[1] and S.Y. Liu[1,2]

[1]College of Veterinary Medicine, Inner Mongolia Agricultural University, Huhhot, China
[2]Key Laboratory of Clinical Diagnosis and Treatment Technology in Animal Disease, Ministry of Agriculture, Huhhot, China

Corresponding author: S.Y. Liu
E-mail: liushuying_imau@126.com

Genet. Mol. Res. 15 (3): gmr.15038521
Received February 1, 2016
Accepted April 8, 2016
Published August 29, 2016
DOI http://dx.doi.org/10.4238/gmr.15038521

ABSTRACT. The envelope protein (Env) of the Jaagsiekte sheep retrovirus (JSRV) is known to be a unique oncoprotein responsible for inducing ovine pulmonary adenocarcinoma (OPA). The objective of this study was to prepare a specific monoclonal antibody (mAb) against the JSRV Env protein using bioinformatic analysis. According to the structure and epitope prediction results of JSRV Env, the JSRV-$Env_{572-615}$ antigen was prepared via peptide synthesis (amino acid sequence 572-615, denoted as JSRV-$Env_{572-615}$). BALB/c mice were immunized to prepare the anti-JSRV-$Env_{572-615}$ mAb. Spleen cells were fused with SP2/0 myeloma cells after being screened by indirect ELISA and cloned by limiting dilution. The specificity of mAb was evaluated by western blot analysis and immunohistochemistry assays. Western blot results showed that the JSRV Env protein was able to bind to mAb with high

specificity. Immunohistochemistry assays demonstrated that the mAb was able to recognize JSRV Env in adenomatous hyperplasia of the lung. Furthermore, JSRV was detected in peripheral blood leukocytes during the pre-clinical period of OPA in 2 of the 25 sheep using this newly synthesized mAb. Therefore, this mAb may be a useful tool for the detection of JSRV in sheep.

Key words: Epitope prediction; Jaagsiekte sheep retrovirus; Monoclonal antibody; Pre-clinical period detection