Applied Biological Research 14 (2): 226-227, 2012 **Short Note**

TISSUE TROPISM OF *Peste des petits ruminants* (PPR) VIRUS

Chandrahas Sannat*[1], B.S. Chandel, H.C. Chauhan, A.Sen[2], V. Balamurugan[2], Showkeen Muzamil and K.K.Rajak[2]

Department of Microbiology, College of Veterinary Science and Animal Husbandry, Sardarkrushinagar, Sardarkrushinagar Dantiwada Agricultural University, Gujarat - 385 506 (India)
[1]Central Semen Station, Anjora, District Durg, Chhattisgarh - 491 001 (India)
[2]Morbilli Virus Referral Laboratory, IVRI, Mukteshwar Campus, Kumaon, Uttarakhand - 263 138 (India)
*e-mail: *csannat@rediffmail.com*

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Peste des petits ruminants (PPR) is a highly infectious and contagious disease of sheep and goats characterized by stomatitis, diarrhoea, occulonasal discharge and pneumonia. PPR virus enters the host through respiratory tract, and its major site for replication is lymphoid tissues (Tatsuo *et al*., 2001). After entering upper respiratory tract, the virus exhibits pronounced tropism for monocytic and lymphocytic cells and soon replication is detected in draining lymph nodes. Following replication in lymphoid tissues, virus spreads to various organs. Recently, it has been reported that signaling lymphocytic activation molecule (SLAM) or CD150, a membrane glycoprotein, acts as receptor for measles virus, canine distemper virus and rinderpest virus (Seki *et al*., 2003 and Techangamsuwan *et al*., 2010) prompted us to hypothesize that the same molecule may contribute for infection in PPR also. Keeping in view the above facts, the present investigation was aimed to study the tissue tropism of PPR virus.

Tissue materials (lymph node, spleen, lung and intestine) were collected in sterile vial over ice and stored at -20°C till further use from a total of 34 animals (19 goats and 15 sheep from local abattoir of Palanpur, District-Banaskantha (Gujarat) and natural outbreak from villages of District-Banaskantha (Gujarat)) showing symptoms and pathological changes suggestive of PPR. Twelve animals found positive for PPR by Sandwich-ELISA (The PPR Sandwich-ELISA kit for PPRV antigen detection was obtained from National Morbilli Virus Referral Laboratory, Division of Virology, IVRI, Mukteswar. S-ELISA was performed strictly as per the protocol outlined in the user's manual supplied with the kit. The plate was read in an ELISA plate reader (Multiskan Plus, LabSystem) at 492 nm) were taken for study. For the calculation of cut off point, four antigen blank wells (B) having extreme OD values (two wells of lowest OD values and two wells of highest OD values) were excluded. The remaining four wells having intermediate OD values were considered. Cut off was taken as two times the mean OD of these intermediate wells. Samples having more OD than the cut off were taken as positive, while samples having less OD than the cut off were taken as negative. Further, a sample positive in both the duplicate wells was taken as positive. A sample positive in one well and negative in other duplicate well was retested before recording the results. All the four reference positive (C+) wells should have OD of at least 0.4. All the four reference positive (C+) wells should fall in positive range (OD above the cut off). All the four reference negative (C-) wells should fall in negative range (OD below the cut off)

Of the 34 animals sampled, total 12 animals (8 goats and 4 sheep) were found positive for PPRV antigen. Organ wise positivity for PPRV antigen were as follows (Table 1): spleen (35.30%); lymph node (29.41%), lung (26.47%); and intestine (8.82%). Similary, Rajeshwary *et al.* (2000) also concluded that Spleen (63.68% positivity) as the choice of material for antigen detection compared to lymph node and lung, which revealed 51.95% and 48% positivity respectively. PPR virus has propensity to utilize two receptors viz., CD46 and CD150/SLAM (signaling lymphocyte activation

Table 1: Comparative distribution of PPRV antigen in tissue samples of sheep and goats

Animal species	Lymph node	Lung	Spleen	Intestine
Goat (19)	7	5	8	3
Sheep (15)	3	4	4	0
Total (34)	10	9	12	3
Percentage positivity of organs	29.41	26.47	35.30	8.82

molecule) (Sarkar, 2006). CD46 is a complement regulatory protein expressed on all cells except red blood cells (Liszewski *et al*., 1991). SLAM, a glycoprotein is expressed on the surface of a proportion of primary B cells, activated T cells, memory T cells, T cell clones, immature thymocytes, mature dendritic cells and activated monocytes (Tangye *et al*., 2000). Viruses utilizing SLAM receptor were generally lymphotropic in nature and are better adapted to grow on cells expressing SLAM receptor like spleen and lymph node (activated macrophages). The presence or expression levels of SLAM might be higher in lymphoid cells which accounts for increased positivity of spleen and lymph node followed by lung and intestine (Meng *et al*., 2011). While epitheliotropic virus is adapted to grow at conditions that permit the exclusive use of CD46 (not SLAM) in epithelial cells of lung and intestine, which accounts for lower tropism. Further research is to be required to study detailed molecular pathogenesis of PPR virus.

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