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INFORMATION

Hokkaido University conferred the degree of Doctor of Philosophy (Ph. D) in Veterinary Medicine on September 29, 2000 to 2 recipients.

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Serological prevalence, molecular epidemiology and vertical transmission of bovine retrovirus

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Bovine immunodeficiency virus (BIV), a member of the lentivirus subfamily of retroviruses, was originally isolated from a dairy cow with persistent lymphocytosis, lymphoid hyperplasia and perivascular cuffing in brain. Serological studies indicated that BIV is present worldwide. In many cases, such a demonstration is complicated by the presence of confounding factors, including co-infection with bovine leukemia virus (BLV) which is an etiologic agent of enzootic bovine lymphosarcoma. In this study, seroprevalence of BIV and BLV, and molecular epidemiological analysis of BIV were carried out in dairy and beef cattle in Japan, water buffaloes in Pakistan and in draught animals in Cambodia. Additionally, vertical transmission of BLV and BIV was also analyzed in dairy cattle herds.

Amongst dairy cattle from different herds in Hokkaido examined, 28.6% of cattle were BLV-seropositive, and 11.7% of cattle were seropositive for BIV, while 4.2% of cattle were seropositive for both BIV and BLV. In Paki-

stan, 10.3% of cattle and 15.8% of buffaloes examined were found for BIV-seropositive, while 0.8% of water buffaloes, and no cattle were positive for anti-BLV antibodies. In Cambodia, 26.3% of cattle and 16.7% of water buffaloes were BIV-seropositive, while 5.3% of cattle were positive for anti-BLV antibodies. No buffalo was seropositive, and no dual infection for BIV and BLV was found. These results indicated that BIV and BLV infections were found not only in dairy and beef cattle, but also in water buffalo and draught animals in subtropical as well as tropical areas.

BIV-proviral DNA was found in BIV-seropositive animals, and the Japanese BIV field isolates appear to be antigenically and genetically similar to American BIV isolate R29. In contrast, the lengths of amino acid sequences of the surface envelope genes of all Japanese, Pakistan and Cambodian BIV field isolates were smaller, and several base substitutions were observed in the V1 region, and deletions were also found in the V2 region.

Phylogenetic analysis revealed that the genotypes of Asian BIV isolates were different from American BIV isolates, and that the variations in the genotype did not depend on host breeds.

Twenty six cases of offspring born from dams infected with only BLV (17cases) or with both BIV and BLV (9 cases) were examined for BLV and BIV infections before and after colostrum feeding. Seven offspring born from BLV-positive dams were BLV-negative before colostrum feeding. Thereafter, 5 offspring were fed with BLV-positive colostrum from their dams, but still remained BLV-negative. The 10offspring born from BLV-positive dams were fed with BLV-negative colostrum, or some of them were fed with pasteurized colos-

trum or milk, and were also negative for *in utero* infection. In the cases of 9 offspring born from dams co-infected with BLV and BIV, 2 calves were BIV-positive and one of them was BLV-positive before colostrum, indicating that *in utero* transmission occurred. After colostrum feeding from their dams, these two calves converted to both BIV- and BLV-positive. Two out of 4 newborn calves were BIV-positive before colostrum feeding and the other 3 calves converted to both BIV- and BLV-positive after colostrum or milk feeding. Thus, BIV can be transmitted to offspring *in utero* and BLV can be transmitted through colostrum or milk if dams are infected with both BIV and BLV.

Role of activin A on *in vitro* development of bovine early preimplantation embryos

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