

Poster presentation

Open Access

Evaluation of two interspecific recombinant viruses generated from two neurotropic bovine alphaherpesviruses: genomic characterization and virulence properties in the natural host

Maria Paula Del Medico¹, Maria Fatima Ladelfa¹, Fiorella Kotsias¹, Julien Thiry², François Meurens³, Günther Keil⁴, Sonia Alejandra Romera¹, Etienne Thiry² and Benoît Muylkens^{*2}

Address: ¹Virology Institute, Veterinary and Agricultural Science Research Centre, National Institute of Agricultural Technology, Buenos Aires, Argentina, ²Virology and Viral Diseases, Department of Infectious and Parasitic Diseases, Faculty of Veterinary Medicine, University of Liege, B-4000 Liege, Belgium, ³Institut National de la Recherche Agronomique (INRA), UR1282, Infectiologie Animale et Santé Publique, F-37380, Nouzilly (Tours), France and ⁴Institute of Molecular Biology, Friedrich-Loeffler-Institutes, Federal Research Centre for Virus Diseases of Animals, 17493 Greifswald-Insel Riems, Germany

Email: Benoît Muylkens* - b.muylkens@ulg.ac.be

* Corresponding author

from Infectious diseases of the nervous system: pathogenesis and worldwide impact
Paris, France. 10–13 September 2008

Published: 23 September 2008

BMC Proceedings 2008, 2(Suppl 1):P14

This abstract is available from: <http://www.biomedcentral.com/1753-6561/2/S1/P14>

© 2008 Del Medico et al; licensee BioMed Central Ltd.

Bovine herpesvirus 1 (BoHV-1) and bovine herpesvirus 5 (BoHV-5) are two closely related alphaherpesviruses that infect cattle. Both viruses are neurotropic but only BoHV-5 significantly replicates in the central nervous system and induces neurological disease. We previously isolated 2 interspecific recombinant viruses (R1 and R2) between BoHV-1 and BoHV-5 [1]. We report here on the precise characterization of the genetic backgrounds and on the virulence assessment of these two BoHV-1/5 recombinants in their natural host.

An exhaustive PCR/sequencing approach led us to identify the precise location of the two cross-over (CO) points where recombination events occurred between the parental strains. The first CO occurred in a 44 base pairs (bp) sequence of homology at the 3' end of the UL28 encoding genes of BoHV-1 and BoHV-5. The resulting recombinant (R1) inherited 37% of the BoHV-1 genome. The rest of its genome (63%) is homologous to BoHV-5 containing the final region of the unique long (UL) region (from UL27 to UL0.5), the internal and terminal repeats (IR and TR) and the unique short region (US). The second CO occurred in a 39 bp sequence of homology within the UL43 gene. The

resulting recombinant (R2) is mainly composed of BoHV-1 sequences (86%). It is homologous to BoHV-1 in a large portion of the UL region (from UL43 to UL0.5), in the IR/TR and in the US region. BoHV-5 sequences account for 14% of its genome content.

In order to study the *in vivo* virulence of the two recombinants, six groups of 4 animals each were inoculated with the recombinant, parental and control viruses. Data obtained from the virology and serology indicated that parental BoHV-1 and R2 were fully attenuated viruses, BoHV-5 was mildly virulent in the natural host and R1 displayed an intermediate virulence pattern between its two parental strains.

In conclusion, this study provided a detailed analysis of two interspecific recombinant viruses generated from closely related alphaherpesviruses infecting the same natural host. It demonstrated that recombination can occur with very short fragments of sequence homology. Recombination is efficacious at enhancing alphaherpesvirus diversity and is susceptible to increase virus replication properties *in vivo*.

References

1. Meurens F, Keil GM, Muylkens B, Gogev S, Schynts F, Negro S, Thiry E: **Interspecific recombination between two ruminant alphaherpesviruses, bovine herpesviruses 1 and 5.** *J Virol* 2004, **78**:9828-9836.

Publish with **BioMed Central** and every scientist can read your work free of charge

"BioMed Central will be the most significant development for disseminating the results of biomedical research in our lifetime."

Sir Paul Nurse, Cancer Research UK

Your research papers will be:

- available free of charge to the entire biomedical community
- peer reviewed and published immediately upon acceptance
- cited in PubMed and archived on PubMed Central
- yours — you keep the copyright

Submit your manuscript here:
http://www.biomedcentral.com/info/publishing_adv.asp

