



## POSTER PRESENTATION

## Open Access

# Hyper-replicative bovine leukemia virus by mutation of an envelope N-linked glycosylation site

A de Brogniez<sup>1\*</sup>, AB Bouzar<sup>1</sup>, J-R Jacques<sup>1</sup>, N Gillet<sup>1</sup>, O Pritsch<sup>3</sup>, L Tomé<sup>3</sup>, M Reichert<sup>2</sup>, L Willems<sup>1</sup>*From* 16th International Conference on Human Retroviruses: HTLV and Related Viruses  
Montreal, Canada. 26-30 June 2013

Reverse genetics can be used in the bovine leukemia virus (BLV) system to characterize mechanisms of viral persistence and pathogenesis. The question addressed here pertains to the role of glycans bound to the BLV envelope glycoprotein (SU). A commonly accepted hypothesis is that addition of carbohydrates to the SU protein potentially creates a structure called « glycan shield » that confers resistance to the virus against the host immune response. On the other hand, glycosylation can also modulate attachment of the virus to the cell membrane. To unravel the role of SU glycosylation, three complementary strategies were developed: pharmacological inhibition of different glycosylation pathways, interference with glycan attachment and site-directed mutagenesis of N-glycosylation sites in an infectious BLV provirus. The different approaches show that glycosylation is required for cell fusion, as expected. Simultaneous mutation of all 8 potential N-glycosylation sites destroys infectivity. Surprisingly, mutation of the asparagine residue at position 230 creates a virus having an increased capacity to form syncytia *in vitro*. Compared to wild-type BLV, mutant N230 also replicates at accelerated rates *in vivo*. Collectively, this data thus illustrates an example of a N-glycosylation site that restricts viral replication, contrasting with the hypothesis supported by glycan shield model.

**Authors' details**<sup>1</sup>GxABT and GIGA, University of Liege, Gembloux and Liège, Belgium.<sup>2</sup>Department of Pathology, National Veterinary Research Institute, Pulawy, Poland. <sup>3</sup>Protein Biophysic Unit, Pasteur Institute, Montevideo, Uruguay.

Published: 7 January 2014

\* Correspondence: [Alix.deBrogniez@doct.ulg.ac.be](mailto:Alix.deBrogniez@doct.ulg.ac.be)<sup>1</sup>GxABT and GIGA, University of Liege, Gembloux and Liège, Belgium  
Full list of author information is available at the end of the article

doi:10.1186/1742-4690-11-S1-P141

**Cite this article as:** de Brogniez *et al.*: Hyper-replicative bovine leukemia virus by mutation of an envelope N-linked glycosylation site.*Retrovirology* 2014 **11**(Suppl 1):P141.**Submit your next manuscript to BioMed Central and take full advantage of:**

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at  
[www.biomedcentral.com/submit](http://www.biomedcentral.com/submit)© 2014 de Brogniez *et al.*; licensee BioMed Central Ltd. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/2.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated.