

Washington University School of Medicine

Digital Commons@Becker

Open Access Publications

2014

Tax inflicts DNA damage through activation of Nitric Oxide production

Hicham H. Baydoun

Washington University School of Medicine in St. Louis

Lee Ratner

Washington University School of Medicine in St. Louis

Follow this and additional works at: https://digitalcommons.wustl.edu/open_access_pubs

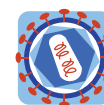
Please let us know how this document benefits you.

Recommended Citation

Baydoun, Hicham H. and Ratner, Lee, "Tax inflicts DNA damage through activation of Nitric Oxide production." *Retrovirology*. 11, Suppl 1. P107. (2014).

https://digitalcommons.wustl.edu/open_access_pubs/2162

This Open Access Publication is brought to you for free and open access by Digital Commons@Becker. It has been accepted for inclusion in Open Access Publications by an authorized administrator of Digital Commons@Becker. For more information, please contact vanam@wustl.edu.



POSTER PRESENTATION

Open Access

Tax inflicts DNA damage through activation of Nitric Oxide production

Hicham H Baydoun, Lee Ratner*

From 16th International Conference on Human Retroviruses: HTLV and Related Viruses
Montreal, Canada. 26-30 June 2013

Adult T-cell Leukemia-Lymphoma (ATLL) is an aggressive and fatal malignancy of CD4+ T-lymphocytes associated with HTLV-1 infection, and an effective treatment is not yet available. The molecular mechanism underlying ATLL has not been fully elucidated. However, accumulation of genomic instability is believed to be a driving force for leukemogenesis. How genomic instability accumulates in HTLV-1 infected cells is currently under intensive investigation. Recently, we found that the HTLV-1 viral oncoprotein, Tax, which is implicated in the chronic inflammatory response, induces DNA Double Strand Breaks (DDSB). Tax is known to activate the key T-cell inflammatory transcription factors, NF- κ B, and this activation is critical for the leukemogenic process associated with HTLV-1 infection. Of note, we found that inducible nitric oxide synthase (iNOS), the enzyme that catalyzes the production of nitric oxide (NO) is highly expressed in HTLV-1 and Tax expressing cells. Interestingly, we show that the expression of iNOS is Tax-dependent and specifically requires the classical NF- κ B pathway. In addition, IRF-1, the interferon regulatory factor that collaborates with NF- κ B transcription factors to activate iNOS expression was also found activated by the JAK/STAT pathway. Our results show a correlation between the number of DDSB and the production of NO in tumors isolated from Tax transgenic mice. We also observed a dramatic reduction of DDSB when NO production was inhibited. Determination of the impact of NO on tumors in an ATLL mouse model will open a new area in the development of alternative strategies for the treatment/prevention of ATLL.

Published: 7 January 2014

doi:10.1186/1742-4690-11-S1-P107

Cite this article as: Baydoun and Ratner: Tax inflicts DNA damage through activation of Nitric Oxide production. *Retrovirology* 2014 **11** (Suppl 1):P107.

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



Department of Medicine, Division of Molecular Oncology, Washington University in St. Louis, USA



© 2014 Baydoun and Ratner; 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.