



Direct detection of diverse metabolic changes in virally transformed and Tax-expressing cells by mass spectrometry

Prabhakar Sripadi, Bindesh Shrestha, Rebecca Easley, Lawrence Carpio, Kylene Kehn-Hall, Sebastien Chevalier, Renaud Mahieux, Akos Vertes, Fatah Kashanchi

► To cite this version:

Prabhakar Sripadi, Bindesh Shrestha, Rebecca Easley, Lawrence Carpio, Kylene Kehn-Hall, et al.. Direct detection of diverse metabolic changes in virally transformed and Tax-expressing cells by mass spectrometry. 15th International Conference on Human Retroviruses: HTLV and Related Viruses, Jun 2011, Leuven and Gembloux, Belgium. pp.A179, 10.1186/1742-4690-8-S1-A179 . inserm-00663645

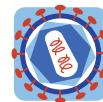
HAL Id: inserm-00663645

<https://inserm.hal.science/inserm-00663645>

Submitted on 27 Jan 2012

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



MEETING ABSTRACT

Open Access

Direct detection of diverse metabolic changes in virally transformed and Tax-expressing cells by mass spectrometry

Prabhakar Sripadi¹, Bindesh Shrestha¹, Rebecca Easley², Lawrence Carpio², Kylene Kehn-Hall², Sebastien Chevalier³, Renaud Mahieux⁴, Akos Vertes¹, Fatah Kashanchi^{2,5*}

From 15th International Conference on Human Retroviruses: HTLV and Related Viruses
Leuven and Gembloux, Belgium. 5-8 June 2011

HTLV-1-induced transformation causes extensive changes at the gene, protein and metabolite levels. These changes are usually followed by gene-expression profiling and proteomic analysis. Exploring the metabolic consequences of viral transformation adds to the picture because the viruses rely on the metabolic network of their cellular hosts for survival and replication. Metabolites are small molecules of diverse physico-chemical properties with greatly different abundance levels that make their analysis challenging. Typically optical (e.g., Fourier transform infrared spectrometry), nuclear magnetic resonance (NMR) and mass spectrometric techniques in combination with separation techniques, such as gas chromatography, high performance liquid chromatography (HPLC) and capillary electrophoresis, have been used for metabolomic studies. Here we utilized a new and novel method called laser ablation electrospray ionization (LAESI) to detect metabolites without any processing of samples. When using the LAESI technique to identify metabolic changes in HTLV1 and Tax1 transformed T lymphocytes and in HTLV3 and Tax3 cells, we found virus type specific (HTLV1 vs. HTLV3), expression specific (Tax1 vs. Tax3) and cell type specific (T lymphocytes vs. kidney epithelial cells) changes in the metabolite profiles. We have identified a number of metabolites that are known in the literature to be deregulated in the viral transformation process (e.g., arginine, cAMP, glutathione) as well as multiple novel metabolites that may have

implications in HTLV1-induced transformation (e.g., putrescine, N-acetyl aspartic acid, methoxytyramine). These new findings point to metabolic pathways that have a heretofore unexplored role in the viral transformation of host cells.

Author details

¹The George Washington University, Department of Chemistry, W. M. Keck Institute of Proteomics Technology and Applications, Washington, DC, 20037, USA. ²George Mason University, Department of Molecular and Microbiology, National Center for Biodefense and Infectious Diseases, Manassas, VA, 20110, USA. ³National Institutes of Health/National Cancer Institute, Laboratory of Cellular Oncology, Bethesda, Maryland, 20892, USA. ⁴Ecole Normale Supérieure de Lyon, Equipe Oncogenèse Rétrovirale, U758 INSERM, Lyon, France. ⁵The George Washington University Medical Center, Department of Microbiology, Immunology, and Tropical Medicine, Washington, DC, 20037, USA.

Published: 6 June 2011

doi:10.1186/1742-4690-8-S1-A179

Cite this article as: Sripadi et al.: Direct detection of diverse metabolic changes in virally transformed and Tax-expressing cells by mass spectrometry. *Retrovirology* 2011 **8**(Suppl 1):A179.

* Correspondence: fflashanc@gmu.edu

²George Mason University, Department of Molecular and Microbiology, National Center for Biodefense and Infectious Diseases, Manassas, VA, 20110, USA

Full list of author information is available at the end of the article