Submitter Name: Bradley Aouizerat
Submitted email: bea4@nyu.edu

Frequent Cocaine Use is Associated with Larger HIV Reservoir Size Quantified by the Intact Proviral DNA Assay

Bradley E. Aouizerat[1,2], Ke Xu[3,4], Bryan C. Quach[5], Dana B. Hancock[5], Eric Otto Johnson[5,6]

[1] Department of Oral and Maxillofacial Surgery, New York University, [2] Bluestone Center for Clinical Research, New York University, [3] Department of Psychiatry, School of Medicine, Yale University, [4] Veteran's Affairs Connecticut Healthcare System, [5] GenOmics, Bioinformatics, and Translational Research Center, Biostatistics and Epidemiology Division, RTI International, [6] Fellows Program, RTI International.

Background: With the success of combination antiretroviral therapy (cART) and public health strategies to reduce HIV incidence, much of the burden in developed countries is now as a chronic disease, including among drug users. Managing HIV progression and searching for an HIV cure, which is dependent on eliminating the HIV latent reservoir (HLR), are of paramount importance. Cocaine—one of the most frequently abused illicit drugs among HIV-infected individuals—increases viral load, worsens HIV progression, slows decline of viral production after cART, and accelerates mortality.

Hypothesis: The CD4 T-cell HLR, quantified using the intact proviral DNA assay (IPDA) in HIV-infected individuals, is adversely impacted by cocaine use.

Methods and Results: CD4 T-cell genomic DNA isolated from stored peripheral blood mononuclear cells collected from 525 participants with self-reported cocaine use (164 frequent cocaine users, 361 non-users). Participants were required to have an undetectable HIV viral load measured by commercial assay for a minimum of 6 months. Intact proviral HIV DNA was measured using IPDA, which provided estimates of intact provirus per 10^6 CD4 T-cells. The intact proviral HLR was statistically significantly larger in cocaine users (median: 179.3, interquartile range [IQR] 27.9, 501.3) as compared to non-users (82.5, IQR: 24.3, 210.3) (p=0.0001) particularly among African Americans and Hispanics.

Conclusion: Our preliminary results show that cocaine use is associated with an increase in the HLR in cART adherent virologically suppressed HIV-infected women. Transcriptomic analysis using RNA-sequencing to determine the effects of cocaine use on gene regulation in this cohort is currently underway.