

Submitter Name: Michael Li
Submitter email: mjli@mednet.ucla.edu

A social genomics perspective on methamphetamine use, HIV, and intimate partner violence

Michael Li¹, India Richter², Pamina Gorbach², Steven Shoptaw¹, and Steven Cole³

¹Department of Family Medicine, University of California, Los Angeles; ²Department of Epidemiology, University of California, Los Angeles; ³ Department of Psychiatry and Biobehavioral Sciences

Background: Research has linked adverse social experiences to a conserved transcriptional response to adversity (CTRA), a pattern marked by upregulated inflammatory and downregulated type I interferon gene expression.

Rationale/Significance: In Black and Latinx sexual minority men (SMM), social adversity is comorbid with stimulant misuse and HIV, both conditions that dysregulate inflammatory and innate antiviral responses measured in CTRA.

Hypothesis: We hypothesize that methamphetamine use (urine drug screen), unsuppressed HIV viral load (>200 c/mL), self-reported experiences of intimate partner violence (IPV) (past 12 months), and self-reported housing instability (past 12 months) are synergistically associated with upregulated CTRA gene expression in Black and Latinx SMM living with HIV.

Results: Data are from 147 HIV-positive Black (45%) and Latinx (55%) SMM recruited from the mSTUDY, a cohort of 561 SMM aged 18-40 in Los Angeles, CA of whom half are HIV-positive and substance-using. CTRA was measured from RNA sequencing of PBMCs to quantify a 28-gene contrast assessing upregulated inflammation and downregulated type I interferon gene expression. Mixed linear regression indicated no significant interaction between methamphetamine use, unsuppressed viral load, and IPV on CTRA expression. Independently, methamphetamine use was associated with a 23% CTRA increase ($p=.003$), unsuppressed viral load was associated with a 35% CTRA increase ($p<.001$), and IPV was associated with a 17% CTRA increase ($p=.033$), adjusting for housing instability and time which were not significant covariates.

Discussion: Findings suggest experienced IPV, current methamphetamine use, and current HIV viremia are linked to increased pro-inflammatory and decreased antiviral gene regulatory pathways involved in CTRA.