Pharmacy-based approaches to improving HIV and substance use related harms in high-risk communities

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Rollins School of Public Health
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Outline

• Epidemiology of HIV by race and ethnicity

• Epidemiology of sex and substance use risk behaviors by race and ethnicity

• Pharmacy approaches to reducing racial and ethnic inequities in HIV
  – Expanded social, medical and treatment referrals
  – HIV testing
  – Pre exposure prophylaxis (PrEP)
• Racial and ethnic inequities in HIV exist

Prejean 2011; MMWR 2012; Lehman 1994; Compton 2007; Armstrong 2009; Holtzman 2001
HIV Diagnosis by race and ethnicity, 2005-2014

- **African American**
- **White**
- **Hispanic/Latino**
- **Multiple races**

Diagnosis Number

- 2005: 25000
- 2014: 20000

CDC Fact sheet
HIV Diagnosis by race and ethnicity, 2005-2014

YOU CAN GET HIV VIA...

- Sex without a condom
- Passed from mother to baby
- Sharing injecting equipment
- Contaminated blood transfusions & organ transplants

CDC Fact sheet
Estimated New Infections among People Who Inject Drugs by Gender and Race/Ethnicity, 2010—United States*

*Subpopulations representing 2% or less of the overall US epidemic are not represented in this chart.

HIV and Injection Drug Use

November 2016

Fast Facts

• Sharing needles, syringes, and other injection equipment is a direct route of HIV transmission.
• Social and structural factors make it difficult to prevent and treat HIV among people who inject drugs.
• Recent trends in injection drug use have created new prevention challenges.

The risk for getting or transmitting HIV is very high if an HIV-negative person uses injection equipment that someone with HIV has used. This high risk is because the drug materials may have blood in them, and blood can carry HIV.

HIV diagnoses among persons who inject drugs (PWID) declined 48% from 2008 to 2014 (https://www.cdc.gov/vitalsigns/hiv-drug-use/index.html). However, injection drug use (IDU) in nonurban areas has created prevention challenges and has placed new populations at risk for HIV.

The Numbers

New HIV Infections

• In 2015, 6% (2,392) of the 39,513 diagnoses of HIV in the United States were attributed to IDU and another 3% (1,202) to male-to-male sexual contact and IDU.
• Of the HIV diagnoses attributed to IDU in 2015, 59% (1,412) were among men, and 41% (980) were among women.
• Of the HIV diagnoses attributed to IDU in 2015, 38% (901) were among blacks/African Americans, 40% (951) were among whites, and 19% (443) were among Hispanics/Latinos.
• If current rates continue, 1 in 23 women who inject drugs and 1 in 36 men who inject drugs will be diagnosed with HIV in their lifetime.

Living With HIV

• At the end of 2013, an estimated 103,100 men in the United States were living with HIV attributed to IDU. Of these, 5% were undiagnosed. An estimated 68,200 women were living with HIV attributed to IDU, and 5% were undiagnosed.
• Among PWID who were diagnosed with HIV in 2014, 82% of males and 83% of females were linked to care within 3 months.
• Among PWID diagnosed with HIV in 2012 or earlier, 49% of males and 56% of females were retained in HIV care at the end of 2013.

Prevention Challenges

• The high-risk practices of sharing needles, syringes, and other injection equipment are common among PWID. In a study of cities with high levels of HIV, 40% of new PWID (those who have been injecting for 5 years or less) shared syringes. From 2005 to 2015, syringe sharing declined 34% among black PWID and 12% among Hispanic/Latino PWID, but did not decline among white PWID.
• Risk estimates show that the average chance that an HIV-negative person will get HIV each time that person shares needles to inject drugs with an HIV-positive person is about 1 in 160 (http://www.cdc.gov/hiv/risk/estimates/riskbehaviors.html).
• Injecting drugs can reduce inhibitions and increase sexual risk behaviors, such as having sex without a condom or without medicines to prevent HIV, having sex with multiple partners, or trading sex for money or drugs.

HIV Diagnoses Attributed to Injection Drug Use by Race/Ethnicity and Sex, 2015—United States

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Black</td>
<td>Hispanic/Latino</td>
</tr>
<tr>
<td>Male</td>
<td>538</td>
<td>328</td>
</tr>
<tr>
<td>Female</td>
<td>363</td>
<td>115</td>
</tr>
</tbody>
</table>

*Subpopulations representing 2% or less of the overall US epidemic are not represented in this chart.

HIV Diagnoses Among Men Who Have Sex With Men, by Race/Ethnicity and Age at Diagnosis, 2015—United States
• Racial and ethnic inequities in HIV exist

• Sex and substance use risk behaviors do not explain these disparities

• Racial minorities have lower
  – Sexual risk behaviors
  – Drug risk behaviors

Prejean 2011; MMWR 2012; Lehman 1994; Compton 2007; Armstrong 2009; Holtzman 2001
Prevalence of condom use during last sexual intercourse in the past 12 months

<table>
<thead>
<tr>
<th></th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>21.7</td>
<td>31.7</td>
</tr>
<tr>
<td>Black</td>
<td>31.9</td>
<td>42.3</td>
</tr>
<tr>
<td>Latino</td>
<td>23.8</td>
<td>33.2</td>
</tr>
</tbody>
</table>

Copen 2017 – National Survey of Family Growth
## Estimated proportion of persons who inject drugs in the United States by race/ethnicity

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>% PWID</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black/African American</td>
<td>2.5</td>
<td>1.3</td>
</tr>
<tr>
<td>White</td>
<td>2.7</td>
<td>2.1</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>1.6</td>
<td>1.0</td>
</tr>
<tr>
<td>Other</td>
<td>1.7</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Lansky et al 2014
Factors associated with receptive syringe sharing among injecting drug users: NHBS-IDU 2009

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Receptive syringe sharing</th>
<th></th>
<th>Final multivariable model</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bivariate analysis</td>
<td>aPR (95% CI)</td>
<td>p value</td>
<td>aPR (95% CI)</td>
</tr>
<tr>
<td>Age 18–29 years (ref: ≥30 years)</td>
<td>1.42 (1.29, 1.56)</td>
<td>1.14 (1.07, 1.22)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Female gender</td>
<td>1.15 (1.05, 1.25)</td>
<td>1.27 (1.14, 1.41)</td>
<td>0.003</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Race/ethnicity (ref: Black)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.41 (1.25, 1.58)</td>
<td>1.36 (1.25, 1.48)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>White</td>
<td>1.52 (1.35, 1.71)</td>
<td>1.44 (1.33, 1.55)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Other C</td>
<td>1.30 (1.15, 1.47)</td>
<td>1.27 (1.14, 1.41)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Binge drinking, past 30 days</td>
<td>1.39 (1.30, 1.50)</td>
<td>1.26 (1.15, 1.37)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Age at first injection ≤18 years</td>
<td>1.14 (1.06, 1.22)</td>
<td>1.15 (1.05, 1.25)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Years since first injected ≤6 years</td>
<td>1.08 (0.98, 1.18)</td>
<td>0.175 (0.165, 0.185)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Injected daily</td>
<td>1.26 (1.15, 1.37)</td>
<td>1.15 (1.08, 1.22)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Obtained syringes from unreliable sources</td>
<td>1.99 (1.85, 2.15)</td>
<td>1.70 (1.56, 1.85)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Had unprotected sex, past 12 months</td>
<td>1.70 (1.57, 1.85)</td>
<td>1.36 (1.24, 1.49)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Had ≥2 sex partners</td>
<td>1.58 (1.48, 1.69)</td>
<td>1.26 (1.15, 1.37)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Had exchange sex partners</td>
<td>1.68 (1.55, 1.81)</td>
<td>1.32 (1.23, 1.42)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Last sex partner ever injected drugs</td>
<td>1.55 (1.45, 1.66)</td>
<td>1.24 (1.16, 1.32)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Participated in alcohol/drug treatment program</td>
<td>1.11 (1.06, 1.17)</td>
<td>1.03 (1.01, 1.05)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Received counseling about ways to prevent HIV infection</td>
<td>1.09 (1.02, 1.17)</td>
<td>0.012 (0.012, 0.012)</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>
HIV Prevention Intervention strategies

• Individual level interventions are successful…but…
  – Unsustainable effects
• Unequal distribution by race
  • Syringe access
  • Pre-exposure prophylaxis

Williams and Metzger 2010; Cooper et al 2009; Huang et al, MMWR 2018
Effective HIV prevention programmes require a combination of behavioural, biomedical and structural interventions
Structural interventions

Intervention strategies that target the economic, social, contextual, policy or organizational levels or factors that have increased risk of or protected against HIV
What’s the role of pharmacies in HIV?
What’s the role of pharmacies in HIV?

- Medication dispensing
What’s the role of pharmacies in HIV?

Prevention?

Medication dispensing
July 2016 assessment of whether a state or DC law exists that allows the retail sale of syringes and needles to a person who injects drugs

State Law Authorization

- **Yes**
- **Potentially**
- **No**

[Map of the United States indicating which states have laws allowing the retail sale of syringes and needles to those who inject drugs.]
July 2016 assessment of whether a state or DC law exists that allows the retail sale of syringes and needles to a person who injects drugs.
Outline

• Epidemiology of HIV by race and ethnicity

• Epidemiology of sex and substance use risk behaviors by race and ethnicity

• Pharmacy approaches to reducing racial and ethnic inequities in HIV
  – Expanded social, medical and treatment referrals
  – HIV testing
  – Pre exposure prophylaxis (PrEP)
A SUCCESS!!!

... But not reaching Black and Latino PWID

Increased safe syringe use
- Overall by 100%
- Black PWID by 300%

...but pharmacies want to do more!

SUCCESS!!! in social, medical and treatment referrals!
Pharmacies as Resources Making Links to Community Services

• Community-based randomized pharmacy intervention trial enrolling 88 NYC pharmacies to reduce injection risk among PWID

• PHARM-Link Working Group
  – Advisory group of health care providers, representatives of local health departments and community based organizations (CBOs)
FIGURE 1—Pharmacy enrollment, randomization, and study procedures: Pharmacies as Resources Making Links to Community Services, 2009–2011.

Eligibility criteria
1. ESAP registered
2. 1 new ESAP customer/month
3. 1 new ESAP customer/month become a regular customer
4. No additional criteria to sell syringes

Note. IDU = injection drug user.

Pharmacies Assessed for Eligibility (n = 325)

Completed Baseline (n = 130)

Randomized (n = 88)

Intervention (n = 26)
- Training
  - Harm reduction pharmacy training
  - In-pharmacy staff one-on-one training
- Engage and expand services to IDUs
  - Recruit IDUs into study
  - Give IDUs social service and medical literature
- Pharmacy follow-up surveys (6-month and 12-month exit survey)

Follow-up
- 6-month: n = 18 (69.23%)
- 12-month: n = 18 (76.92%)

Primary Control (n = 29)
- Training
  - In-pharmacy staff one-on-one training
- Pharmacy follow-up surveys (6-month and 12-month exit survey)

Follow-up
- 6-month: n = 21 (72.41%)
- 12-month: n = 19 (65.52%)

Secondary Control (n = 33)
- Pharmacy follow-up surveys (6-month and 12-month exit survey)

Follow-up
- 6-month: n = 27 (81.82%)
- 12-month: n = 27 (81.82%)

Excluded (n = 195)
- Ineligible (n = 154)
- Declined to participate (n = 41)

Declined to be randomized (n = 42)
**TABLE 1—Adjusted Associations of Pharmacy Staff Postintervention Support for the New York State Expanded Syringe Access Program: Pharmacies as Resources Making Links to Community Services, 2009–2011**

<table>
<thead>
<tr>
<th>ESAP Support</th>
<th>Model 1, PR (95% CI)</th>
<th>Model 2, PR (95% CI)</th>
<th>Model 3, PR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention vs primary control group</td>
<td>1.04 (0.93, 1.16)</td>
<td>1.05 (0.94, 1.16)</td>
<td>1.05 (0.94, 1.16)</td>
</tr>
<tr>
<td>Intervention vs secondary control group</td>
<td>1.36** (1.15, 1.60)</td>
<td>1.27** (1.11, 1.46)</td>
<td>1.27** (1.11, 1.47)</td>
</tr>
</tbody>
</table>

Note. CI = confidence interval; ESAP = Expanded Syringe Access Program; PR = prevalence ratio.

*Adjusted for clustering of individuals within pharmacies.

**Adjusted for clustering of individuals within pharmacies and baseline differences in ESAP support.

*Adjusted for clustering of individuals within pharmacies, baseline differences in ESAP support, and race.

*P ≤ .05; **P ≤ .01.
Fig. 1. Study enrollment and retention by study arm, PHARM-Link, 2009–2010.
### Adjusted intervention effect on injection behavior outcomes among PWID, PHARM-Link 2009-2010 (n=482)

<table>
<thead>
<tr>
<th>Study arm</th>
<th>Receptive syringe sharing</th>
<th>Pharmacy primary syringe source</th>
<th>100% sterile syringe use</th>
<th>Pharmacy syringe purchase barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>PR (95% CI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>0.60 (0.33 - 1.09)</td>
<td>1.20 (0.99 – 1.44)</td>
<td>1.24 (1.04 – 1.48)</td>
<td>0.82 (0.62 – 1.09)</td>
</tr>
<tr>
<td>Control</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Adjusted for baseline value, baseline employment and clustering of PWID within pharmacies
What did we learn?

• PHARM-Link had a significant and positive effect on
  – Pharmacy staff beliefs about drug use
  – PWID sterile syringe use

• Pharmacy-based public health services could have an important impact on health and health behavior and transform delivery of preventive services in health care

• Pharmacists wanted to do more
Outline

• Epidemiology of HIV by race and ethnicity

• Epidemiology of sex and substance use risk behaviors by race and ethnicity

• Pharmacy approaches to reducing racial and ethnic inequities in HIV
  – Expanded social, medical and treatment referrals
  – HIV testing
  – Pre exposure prophylaxis (PrEP)
Evaluation of Pharmacy-Based HIV Testing in a High-Risk New York City Community

Silvia Amesty, Natalie D. Crawford, Vijay Nandi, Rafael Perez-Figueroa, Alexis Rivera, Madeline Sutton, Paul J. Weidle, Leigh Willis, Dawn K. Smith, Carolyn Hernandez, Katherine Harripersaud, and Crystal Fuller Lewis

- Pharmacy-based HIV testing pilot
  - 2 pharmacies in Harlem
  - Reached individuals at high risk for HIV transmission
    - racial minorities
    - drug users
    - no recent HIV test
    - lack of regular health care

40% HIV testing uptake!
....But not enough
HIV-related stigma is an important factor for achieving successful HIV prevention.

External HIV-related Stigma
Attitudes or actions expressed towards people living with HIV/AIDS.
- Rejection
- Avoidance
- Intolerance
- Stereotyping
- Judgmental attitudes
- Discrimination
- Disrespect

Internal HIV-related Stigma
Feelings, beliefs or actions within or instigated by the person living with HIV/AIDS.
- Shame
- Self-blame
- Despair
- Great concern over the thoughts and attitudes of others

Consequences of HIV-related stigma
- Mental health issues
- Accessing healthcare services
  - Employment issues
  - Housing issues
- Risk for physical violence and/or verbal abuse

Florom-Smith and DeSantis 2013
Pharmacy Intervention to Improve HIV Testing Uptake Using a Comprehensive Health Screening Approach

Increase HIV testing access in pharmacies

Normalize HIV and HIV testing using media messages that promote comprehensive health screening

Comprehensive Arm
- HIV testing
- Healthy Lifestyles video
- Comprehensive screening package (Glucose, cholesterol and blood pressure)

Video Arm
- HIV testing
- Healthy Lifestyles video

Control Arm
- HIV testing
Pharmacy Intervention to Improve HIV Testing Uptake Using a Comprehensive Health Screening Approach

<table>
<thead>
<tr>
<th>Intervention type</th>
<th>HIV testing</th>
<th>Prevalence ratio (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control arm</td>
<td>Ref.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video arm</td>
<td>1.59 (1.00, 2.53)</td>
<td>0.052</td>
<td></td>
</tr>
<tr>
<td>Comprehensive screening arm</td>
<td>1.61 (1.03, 2.49)</td>
<td>0.034</td>
<td></td>
</tr>
</tbody>
</table>

Adjusted for age and race/ethnicity

Natalie D. Crawford, PhD
Trevano Dean, MPH
Alexis V. Rivera, MPH
Taylor Guffey, MPH
Silvia Amesty, MD, MPH, MSEd
Abby Rudolph, PhD
Jennifer DeCuir, MPH
Crystal M. Fuller, PhD

Crawford et al, Public Health Reports 2016
What did we learn?

• HIV testing in pharmacies could drastically improve testing availability and accessibility

• Wrapping HIV testing into existing screenings in pharmacies could
  1. reduce HIV testing specific stigma
  2. normalize HIV testing
  3. reduce HIV exceptionalism

• Pharmacists wanted to do more
Outline

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• Epidemiology of sex and substance use risk behaviors by race and ethnicity

• Pharmacy approaches to reducing racial and ethnic inequities in HIV
  – Expanded social, medical and treatment referrals
  – HIV testing
  – Pre exposure prophylaxis (PrEP)
(a) Number of HIV cases by ZCTA. (b) Number of major HIV providers within 5 mile driving radius of each census tract.
Pharmacies can remove some barriers to PrEP uptake

- Cost → Payment programs
- Access → Ubiquitous locations and flexible hours
- Distrust → Trusted health professional
- Stigma → Neutral setting
## Evidence of Pharmacies Across the HIV Prevention and Care Continuums

<table>
<thead>
<tr>
<th>HIV Testing</th>
<th>Syringe services</th>
<th>Post exposure prophylaxis</th>
<th>Pre exposure prophylaxis</th>
<th>Antiretrovirals</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>11</td>
<td>1</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>1 study among PWID</td>
<td>5 studies among PWID</td>
<td>0 among risk population</td>
<td>3 among MSM</td>
<td>4 among HIV positive patients</td>
</tr>
</tbody>
</table>

Crawford et al, forthcoming AIDS Behav
Willingness to Discuss and Screen for Pre-Exposure Prophylaxis in Pharmacies Among Men Who Have Sex With Men

Natalie D. Crawford, PhD¹, Taynel Albarran, BA¹, Allison Chamberlain, PhD²,³, Roderick Hopkins, BS¹, Dorie Josma, MPH¹, Joseph Morris, BA¹, and Udomirim N. Onwubiko, MPH³

• Over 69% were willing to discuss PrEP in a pharmacy
• Over 60% were willing to be screened for PrEP in a pharmacy
• Only significant correlate of willingness to discuss or screen for PrEP was interest in PrEP
• There were no significant differences by race and ethnicity
Pharmacy-based pre-exposure prophylaxis support among pharmacists and men who have sex with men


• Qualitative study among pharmacists and men who have sex with men

• Key themes
  – Strong support for in-pharmacy PrEP screening and delivery
  – Privacy and confidentiality are important to MSM
  – Pharmacy staff training is important for pharmacist
Pharmacy based PrEP model development

Figure 1. Conceptual framework integrating pharmacy work system influencing PrEP

<table>
<thead>
<tr>
<th>Pharmacy work system factors</th>
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<tbody>
<tr>
<td>Pharmacy Environment</td>
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<tr>
<td>Business flow</td>
</tr>
<tr>
<td>Internal (private space)</td>
</tr>
<tr>
<td>Pharmacy Organization</td>
</tr>
<tr>
<td>Stigma towards HIV and PrEP</td>
</tr>
<tr>
<td>Personnel</td>
</tr>
<tr>
<td>Pharmacists and technicians</td>
</tr>
<tr>
<td>Tasks</td>
</tr>
<tr>
<td>PrEP study activities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-risk behavior</td>
</tr>
<tr>
<td>Need for PrEP</td>
</tr>
<tr>
<td>Pharmacy PrEP access</td>
</tr>
<tr>
<td>Acceptability of PrEP</td>
</tr>
<tr>
<td>PrEP uptake</td>
</tr>
<tr>
<td>Reduced HIV transmission</td>
</tr>
</tbody>
</table>

Adaptive protocol development

Formative phase
- Determine logistical barriers and facilitators

Intervention development phase
- Develop and refine study protocol

Pilot study phase
- Implement study protocol in pharmacy
• Pharmacies are viable solutions for reducing HIV and substance use related harms

• Pharmacy based HIV and substance use interventions could increase access for racial minority populations

• Future steps
  – Consider the scalability of pharmacy based interventions
  – Harness pharmacy based populations to better understand substance use and HIV risk behaviors
Thank you for your time.

Columbia University
- Silvia Amnesty

Emory University
- David Holland
- Aaron Siegler
- Patrick Sullivan

Georgia State University
- Henry Young

National AIDS Education Services for Minorities
- Alvan Quamina

New York University
- Crystal Lewis

University of Nebraska
- Donald Klepser

Funding Sources
- Emory Center for AIDS Research P30AI050409
- NIMH 1R34MH119007-01
- RC1DA028284-02
- 1R01 DA0022144-01
- 1 U01 PS000698-2