

interaction improved the model fit: $\chi^2(17) = 23.27, p = .14, CFI = .95, TLI = .93, RMSEA = 0.04$ (90%CI = 0.00–0.08), BIC = –187.70. Post-hoc simple slope analyses demonstrated CEA predicted increases in CU over time for girls, but not boys.

Conclusions: These findings demonstrate the importance of addressing CEA among girls, as CEA-exposed girls may be particularly vulnerable to using cannabis during adolescence.

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Baseline predictors of outpatient induction onto extended-release naltrexone



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Aims: Long-acting injectable naltrexone is a viable option for treatment of opioid dependence. Previous research of inpatient XR-NTX induction have shown that younger age, severity of use, and concurrent substance use are baseline predictors of successful induction. The aim of this study was to identify baseline predictors of outpatient induction onto XR-NTX.

Methods: Opioid-dependent participants ($N = 177$) were treated using 3 different induction schedules. One group received a 7-day buprenorphine taper, 7-day washout and XR-NTX ($N = 52$). A second group received a single day of buprenorphine, 1-day washout, and 4-day oral naltrexone taper and XR-NTX ($N = 106$). A third group received 1-day of buprenorphine, 1-day washout, and 3 day oral naltrexone taper and XR-NTX ($N = 19$).

Results: 50% of the participants completed detoxification and received XR-NTX. IN users ($p = .001$) and RX users ($p = .002$) were more likely to be inducted onto XR-NTX ($p < .001$). Participants with a baseline cannabis toxicology were more likely to receive the 1st injection ($p = .006$). Lower likelihood of induction was predicted by: (1) heroin use ($p < .001$) and (2) family history of substance abuse ($p = .033$).

Conclusions: This research offers insight into the predictors of success for out-patient opioid detoxification and induction onto XR-NTX. Similar to findings of inpatient induction, higher opioid users were less likely to be inducted onto XR-NTX, although younger age and concurrent substance use were not found to be predictive. Baseline toxicology for cannabis was correlated with greater likelihood of outpatient induction, contrasting findings of inpatient predictors. These differences likely reflect the role of continued cannabis use in mitigating outpatient opioid withdrawal, in addition to variability in opioid withdrawal severity of outpatient XR-NTX induction.

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Images for science communications pertinent to drug dependence research and to the general public



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Aims: In this project we seek: (1) to draw attention to new images and visual arts resources that can be used in a graduate student's thesis or dissertation, in books and monographs, and in public presentations on topics pertinent to the CPDD, and (2) to clarify several facets of current regulatory environments governing circumstances under which these resources can be employed. Multiple internet-based search features have created novel options for the discovery of photographs and other visual arts resources that can enhance scientific communication in our field.

Methods: We have organized our effort around a set of commonly encountered questions/answers pertaining to the searchable image gallery resources maintained by the NIH Library of Medicine, the Smithsonian Institution, and other public and private entities, often without specific terms of use (e.g., commercial vs. non-commercial use). Basic principles governing an author's rights and responsibilities about use and secondary adaptation of these forms of intellectual property are addressed.

Results: Questions (with answers) to be covered include: (1) What are some examples of 'public use' images of drugs, drug users, paraphernalia, and related CPDD topics that can be freely used in our publications and presentations? (2) What restrictions and penalties may be faced if incorrect assumptions are made about the 'free use' of material that can be readily copied and pasted from the internet into our own work? (3) What are 'best practices' in this area of science communication?

Conclusions: We hope to encourage use of images and other visual arts resources in order to increase the effectiveness of our science communications within the field and to the public. Our NIDA T32 training program has created a web page with a set of basic principles and 'best practices' on this topic, and we share this resource to be used by other T32 programs and in graduate education generally.

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Psilocybin in long-term meditators: Effects on default mode network functional connectivity and retrospective ratings of qualitative experience



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Aims: Descriptions of meditation experiences can bear striking similarity to descriptions of some experiences with classic (serotonergic) hallucinogens. Neuroimaging studies reveal striking overlap in the effects of psilocybin and the effects of meditation on functional connectivity of the default mode network (DMN). This ongoing study explored the effects of psilocybin on subjective experience and DMN connectivity in long-term meditators.

Methods: 16 meditators (mean lifetime meditation = 4206 h) received either a placebo ($n = 8$) or a high dose psilocybin ($n = 8$) capsule before a laboratory session. Retrospective self-report measures of subjective experience and resting-state fMRI data were collected the day after the session. Seed-based functional connectivity analyses were applied to fMRI data. Self-report measures and functional connectivity of the DMN were compared between placebo and psilocybin groups.

Results: Participants who received psilocybin attributed significantly greater meaning, spiritual significance, psychological challenge, and psychological insight to their session experiences than those who received placebo. 75% of participants in the psilocybin group rated the experience to be in the top 10 most meaningful experiences of their life. Participants who received psilocybin also showed lower functional connectivity between hippocampal and posterior DMN regions and greater functional connectivity among DMN regions than those who received placebo.

Conclusions: Participants attributed substantial meaning to their high-dose psilocybin experience, and showed changes in brain function the day after a high dose of psilocybin. Further research should explore the relationship of these enduring changes in brain function to abuse liability and therapeutic outcomes with psilocybin.

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Combining multiple schedules of reinforcement with glutamate biosensors to examine the effects of cocaine and food on prelimbic glutamatergic signaling in freely-moving rats



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Aims: Drug-specific reward and associated effects on neural signaling are often studied between-subject, where one group self-administers drug and a separate group self-administers a natural reinforcer, like food. However, exposure to drugs of abuse can cause long-term glutamatergic neural adaptations that can affect how an organism responds to drug reward, natural reward, and their associated stimuli. Thus, to isolate drug-specific glutamatergic effects it is important to use models that expose the same organism to all of the aforementioned reinforcers and stimuli. Multiple schedules provide a means of dissociating the rewarding effects of a drug from the rewarding effects of food along with their associated-stimuli, within a single animal. We hypothesized that by using multiple schedules we will be able to assess differential glutamate signaling for cocaine and food within subject.

Methods: Sprague Dawley rats ($n = 7$) were trained to baseline on a FR3 cocaine-food multiple schedule procedure that included 6 cocaine components and 6 food components with 2-minute blackouts between components. After stabilization, we implanted glutamate biosensors into the prelimbic cortex. We then measured glutamate release while rats performed under the cocaine-food multiple schedules.

Results: The average amplitude of prelimbic glutamate release was greater for food responses compared to cocaine responses. The use of frequency distribution analyses showed that the frequency of glutamate release in the 0.1–1 μM and 10–20 μM range was greater for responses associated with food compared to cocaine.

Conclusions: Combining glutamate biosensors with multiple schedules provide a practical means for assessing differential glutamatergic signaling associated with cocaine and food. By using this method we were able to parse out cocaine-specific effects on glutamate in the prelimbic cortex.

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Sexual risk and substance use behaviors among partnered and non-partnered HIV-infected adults with substance dependence



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Aims: To compare recent sexual risk behaviors and substance use among partnered and non-partnered HIV-infected adults with substance dependence or ever injection drug use.

Methods: From 2012–2014, at urban hospital- and community-based HIV primary care settings, we prospectively enrolled confirmed HIV-infected adults (≥ 18 yrs) with past-year drug or alcohol dependence or who ever injected drugs (the Boston ARCH cohort). We compared sexual and substance use behaviors between those with and without a current partner (defined as a spouse, boyfriend or girlfriend).

Results: Among 250 participants, 138 (55%) had a current partner (67% of women, 48% of men). Compared to those without partners, in the past 6 months, more partnered individuals exchanged sex for money, alcohol or drugs (17% vs. 6%, $p = 0.01$). In the past 3 months, more partnered individuals reported unprotected sex (31% vs. 7%, $p < 0.001$) and using alcohol before sex (37% vs. 24%, $p = 0.04$). Although nonsignificant, in the past month, those with partners reported more days of heavy drinking (mean 5.0 vs. 3.9 days, $p = 0.057$) and were more likely to report cocaine use (35% vs. 25%, $p = 0.09$), tranquilizer/sedative use (12% vs. 5%, $p = 0.08$), and multiple substance use (33% vs. 22%, $p = 0.07$).

Conclusions: Among HIV-infected adults with substance dependence, those with partners may engage in higher risk sexual and substance use behaviors than those without partners, which was surprising. To promote the health of HIV-infected individuals with substance dependence and their partners, research is needed to better understand substance use and sexual risk behaviors within partnership contexts.

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