Director's Report

to the

NATIONAL ADVISORY COUNCIL ON DRUG ABUSE

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Nora D. Volkow, M.D.
Director
National Institute on Drug Abuse

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** These sections contain select information. More comprehensive information will be posted in the September 2013 Staff Report to the Director.*

RESEARCH HIGHLIGHTS

Conformational Biosensors Reveal GPCR Signalling From Endosomes. Irannejad R, Tomshine JC, Tomshine JR, Chevalier M, Mahoney JP, Steyaert J, Rasmussen SG, Sunahara RK, El-Samad H, Huang B, von Zastrow M. Nature. 2013 Mar 28; 495(7442): 534-538.
A long-held tenet of molecular pharmacology is that canonical signal transduction mediated by G-protein-coupled receptor (GPCR) coupling to heterotrimeric G proteins is confined to the plasma membrane. Evidence supporting this traditional view is based on analytical methods that provide limited or no subcellular resolution. It has been subsequently proposed that signalling by internalized GPCRs is restricted to G-protein-independent mechanisms such as scaffolding by arrestins, or GPCR activation elicits a discrete form of persistent G protein signalling, or that internalized GPCRs can indeed contribute to the acute G-protein-mediated response. Evidence supporting these various latter hypotheses is indirect or subject to alternative interpretation, and it remains unknown if endosome-localized GPCRs are even present in an active form. Here the authors describe the application of conformation-specific single-domain antibodies (nanobodies) to directly probe activation of the β2-adrenoceptor, a prototypical GPCR, and its cognate G protein, Gs (ref. 12), in living mammalian cells. They show that the adrenergic agonist isoprenaline promotes receptor and G protein activation in the plasma membrane as expected, but also in the early endosome membrane, and that internalized receptors contribute to the overall cellular cyclic AMP response within several minutes after agonist application. These findings provide direct support for the hypothesis that canonical GPCR signalling occurs from endosomes as well as the plasma membrane, and suggest a versatile strategy for probing dynamic conformational change in vivo.

Injectable, Cellular-Scale Optoelectronics With Applications For Wireless Optogenetics. Kim TI, McCall JG, Jung YH, Huang X, Siuda ER, Li Y, Song J, Song YM, Pao HA, Kim RH, Lu C, Lee SD, Song IS, Shin G, Al-Hasani R, Kim S, Tan MP, Huang Y, Omenetto FG, Rogers JA, Bruchas MR. Science. 2013 Apr 12; 340(6129): 211-216.
Successful integration of advanced semiconductor devices with biological systems will accelerate basic scientific discoveries and their translation into clinical technologies. In neuroscience generally, and in optogenetics in particular, the ability to insert light sources, detectors, sensors, and other components into precise locations of the deep brain yields versatile and important capabilities. Here, the authors introduce an injectable class of cellular-scale optoelectronics that offers such features, with examples of unmatched operational modes in optogenetics, including completely wireless and programmed complex behavioral control over freely moving animals. The ability of these ultrathin, mechanically compliant, biocompatible devices to afford minimally invasive operation in the soft tissues of the mammalian brain foreshadow applications in other organ systems, with potential for broad utility in biomedical science and engineering.

Behavioral and Structural Responses To Chronic Cocaine Require A Feedforward Loop Involving ΔFosB and Calcium/Calmodulin-Dependent Protein Kinase II In the Nucleus Accumbens Shell. Robison AJ, Vialou V, Mazei-Robison M, Feng J, Kourrich S, Collins M, Wee S, Koob G, Turecki G, Neve R, Thomas M, Nestler EJ. J Neurosci. 2013 Mar 6; 33(10): 4295-4307.
The transcription factor ΔFosB and the brain-enriched calcium/calmodulin-dependent protein kinase II (CaMKIIα) are induced in the nucleus accumbens (NAc) by chronic exposure to cocaine or other psychostimulant drugs of abuse, in which the two proteins mediate sensitized drug responses. Although ΔFosB and CaMKIIα both regulate AMPA glutamate receptor expression and function in NAc, dendritic spine formation on NAc medium spiny neurons (MSNs), and locomotor sensitization to cocaine, no direct link between these molecules has to date been explored. Here, the authors demonstrate that ΔFosB is phosphorylated by CaMKIIα at the protein-stabilizing Ser27 and that CaMKII is required for the cocaine-mediated accumulation of ΔFosB in rat NAc. Conversely, they show that ΔFosB is both necessary and sufficient for cocaine induction of CaMKIIα gene expression in vivo, an effect selective for D1-type MSNs in the NAc shell subregion. Furthermore, induction of dendritic spines on NAc MSNs and increased behavioral responsiveness to cocaine after NAc overexpression of ΔFosB are both CaMKII dependent. Importantly, they demonstrate for the first time induction of ΔFosB and CaMKII in the NAc of human cocaine addicts, suggesting possible targets for future therapeutic intervention. These data establish that ΔFosB and CaMKII engage in a cell-type- and brain-region-specific positive feedforward loop as a key mechanism for regulating the reward circuitry of the brain in response to chronic cocaine.

Extrasynaptic Targeting of NMDA Receptors Following D1 Dopamine Receptor Activation and Cocaine Self-Administration. Ortinski PI, Turner JR, Pierce RC. J Neurosci. 2013 May 29; 33(22): 9451-9461.

The authors previously showed that after repeated exposure to cocaine, D1-like dopamine receptor (D1DR) stimulation reverses plastic changes of AMPA receptor-mediated signaling in the nucleus accumbens shell. However, there is little information on the impact of cocaine self-administration on D1-NMDA receptor interactions in this brain region. Here, using whole-cell patch-clamp recordings, they assessed whether cocaine self-administration alters the effects of D1DR stimulation on synaptic and extrasynaptic NMDA receptors (NMDARs). In slices from cocaine-naive rats, pretreatment with a D1DR agonist decreased synaptic NMDAR-mediated currents and increased the contribution of extrasynaptic NMDARs. In contrast, neither cocaine self-administration alone nor cocaine experience followed by D1DR stimulation had an effect on synaptic or extrasynaptic NMDAR signaling. Activation of extrasynaptic NMDARs relies on the availability of extracellular glutamate, which is regulated primarily by glutamate transporters. In cocaine-experienced animals, relative to cocaine-naive rats, administration of a glutamate reuptake blocker, dl-threo-β-benzyloxyaspartic acid, revealed increased extrasynaptic NMDAR activity and stronger baseline activity of glutamate uptake transporters. In cocaine-naive rats, the D1DR-mediated increase in extrasynaptic NMDAR signaling was independent of the activity of glutamate reuptake transporters. Together, these results indicate that cocaine experience blunts the influence of D1DRs on synaptic and extrasynaptic NMDAR signaling. Additionally, prior cocaine self-administration limits activation of the extrasynaptic NMDAR pool by increasing glutamate reuptake. These findings outline a pattern of adaptive interactions between D1DRs and NMDARs in the nucleus accumbens shell and demonstrate upregulation of extrasynaptic NMDAR signaling as a novel consequence of cocaine self-administration.

Genome-Wide Association Study On Detailed Profiles Of Smoking Behavior and Nicotine Dependence In A Twin Sample. Loukola A, Wedenoja J, Keskitalo-Vuokko K, Broms U, Korhonen T, Ripatti S, Sarin A-P, Pitkaniemi J, He L, Happola A, Heikkila K, Chou Y-L, Pergadia ML, Heath AC, Montgomery GW, Martin NG, Madden PAF, Kaprio J. Mol Psychiatry 2013. Epub ahead of print.
Smoking is a major risk factor for several somatic diseases and is also emerging as a causal factor for neuropsychiatric disorders. Genome-wide association (GWA) and candidate gene studies for smoking behavior and nicotine dependence (ND) have disclosed too few predisposing variants to account for the high estimated heritability. Previous large-scale GWA studies have had very limited phenotypic definitions of relevance to smoking-related behavior, which has likely impeded the discovery of genetic effects. The authors performed GWA analyses on 1114 adult twins ascertained for ever smoking from the population-based Finnish Twin Cohort study. The availability of 17 smoking-related phenotypes allowed us to comprehensively portray the dimensions of smoking behavior, clustered into the domains of smoking initiation, amount smoked and ND. These results highlight a locus on 16p12.3, with several single-nucleotide polymorphisms (SNPs) in the vicinity of CLEC19A showing association (P<1 ýý 10(-6)) with smoking quantity. Interestingly, CLEC19A is located close to a previously reported attention-deficit hyperactivity disorder (ADHD) linkage locus and an evident link between ADHD and smoking has been established. Intriguing preliminary association (P<1 10(-5)) was detected between DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, 4th edition) ND diagnosis and several SNPs in ERBB4, coding for a Neuregulin receptor, on 2q33. The association between ERBB4 and DSM-IV ND diagnosis was replicated in an independent Australian sample. Recently, a significant increase in ErbB4 and Neuregulin 3 (Nrg3) expression was revealed following chronic nicotine exposure and withdrawal in mice and an association between NRG3 SNPs and smoking cessation success was detected in a clinical trial. ERBB4 has previously been associated with schizophrenia; further, it is located within an established schizophrenia linkage locus and within a linkage locus for a smoker phenotype identified in this sample. In conclusion, the authors disclose novel tentative evidence for the involvement of ERBB4 in ND, suggesting the involvement of the Neuregulin/ErbB signalling pathway in addictions and providing a plausible link between the high co-morbidity of schizophrenia and ND.

Rapid Sensitization Of Physiological, Neuronal, and Locomotor Effects Of Nicotine: Critical Role Of Peripheral Drug Actions. Lenoir M, Tang J, Woods AS, and Kiyatkin E. Journal of Neuroscience 2013, 33(24), 9937–9949.
Repeated exposure to nicotine and other psychostimulant drugs produces persistent increases in their psychomotor and physiological effects (sensitization), a phenomenon related to the drugs' reinforcing properties and abuse potential. Here the authors examined the role of peripheral actions of nicotine in nicotine-induced sensitization of centrally mediated physiological parameters (brain, muscle, and skin temperatures), cortical and VTA EEG, neck EMG activity, and locomotion in freely moving rats. Repeated injections of intravenous nicotine (30g/kg) induced sensitization of the drug's effects on all these measures. In contrast, repeated injections of the peripherally acting analog of nicotine, nicotine pyrrolidine methiodide (nicotinePM, 30g/kg, i.v.) resulted in habituation (tolerance) of the same physiological, neuronal, and behavioral measures. However, after repeated nicotine exposure, acute nicotinePM injections induced nicotine-like physiological responses: powerful cortical and VTA EEG desynchronization, EMG activation, a large brain temperature increase, but weaker hyperlocomotion. Additionally, both the acute locomotor response to nicotine and nicotine-induced locomotor sensitization were attenuated by blockade of peripheral nicotinic receptors by

hexamethonium (3 mg/kg, i.v.). These data suggest that the peripheral actions of nicotine, which precede its direct central actions, serve as a conditioned interoceptive cue capable of eliciting nicotine-like physiological and neural responses after repeated nicotine exposure. Thus, by providing a neural signal to the CNS that is repeatedly paired with the direct central effects of nicotine, the drug's peripheral actions play a critical role in the development of nicotine-induced physiological, neural, and behavioral sensitization.

CREB Phosphorylation Regulates Striatal Transcriptional Responses In The Self-Administration Model Of Methamphetamine Addiction In The Rat. Krasnova IN, Chiflikyan M, Justinova Z, McCoy MT, Ladenheim B, Jayanthi S, Quintero C, Brannock C, Barnes C, Adair JE, Lehrmann E, Kobeissy FH, Gold MS, Becker KG, Goldberg SR, Cadet JL. Neurobiol Dis. 58C:132-143. Epub May 2013.
Neuroplastic changes in the dorsal striatum participate in the transition from casual to habitual drug use and might play a critical role in the development of methamphetamine (METH) addiction. The authors examined the influence of METH self-administration on gene and protein expression that may form substrates for METH-induced neuronal plasticity in the dorsal striatum. Male Sprague-Dawley rats self-administered METH (0.1mg/kg/injection, i.v.) or received yoked saline infusions during eight 15-h sessions and were euthanized 2h, 24h, or 1month after cessation of METH exposure. Changes in gene and protein expression were assessed using microarray analysis, RT-PCR and Western blots. Chromatin immunoprecipitation (ChIP) followed by PCR was used to examine epigenetic regulation of METH-induced transcription. METH self-administration caused increases in mRNA expression of the transcription factors, c-fos and fosb, the neurotrophic factor, Bdnf, and the synaptic protein, synaptophysin (Syp) in the dorsal striatum. METH also caused changes in ΔFosB, BDNF and TrkB protein levels, with increases after 2 and 24h, but decreases after 1month of drug abstinence. Importantly, ChIP-PCR showed that METH self-administration caused enrichment of phosphorylated CREB (pCREB), but not of histone H3 trimethylated at lysine 4 (H3K4me3), on promoters of c-fos, fosb, Bdnf and Syp at 2h after cessation of drug intake. These findings show that METH-induced changes in gene expression are mediated, in part, by pCREB-dependent epigenetic phenomena. Thus, METH self-administration might trigger epigenetic changes that mediate alterations in expression of genes and proteins serving as substrates for addiction-related synaptic plasticity.

Cocaine Drives Aversive Conditioning Via Delayed Activation Of Dopamine-Responsive Habenular and Midbrain Pathways. Jhou TC, Good CH, Rowley CS, Xu SP, Wang H, Burnham NW, Hoffman AF, Lupica CR, Ikemoto S. J Neurosci. 2013 Apr24;33(17):7501-12.
Many strong rewards, including abused drugs, also produce aversive effects that are poorly understood. For example, cocaine can produce aversive conditioning after its rewarding effects have dissipated, consistent with opponent process theory, but the neural mechanisms involved are not well known. Using electrophysiological recordings in awake rats, the authors found that some neurons in the lateral habenula (LHb), where activation produces aversive conditioning, exhibited biphasic responses to single doses of intravenous cocaine, with an initial inhibition followed by delayed excitation paralleling cocaine's shift from rewarding to aversive. Recordings in LHb slice preparations revealed similar cocaine-induced biphasic responses and further demonstrated that biphasic responses were mimicked by dopamine, that the inhibitory phase depended on dopamine D2-like receptors, and that the delayed excitation persisted after drug washout for prolonged durations consistent with findings in vivo. c-Fos experiments further showed that cocaine-activated LHb neurons preferentially projected to and activated neurons in the rostromedial tegmental nucleus (RMTg), a recently identified target of LHb axons that is activated by negative motivational stimuli and inhibits dopamine neurons. Finally, pharmacological excitation of the RMTg produced conditioned place aversion, whereas cocaine-induced avoidance behaviors in a runway operant paradigm were abolished by lesions of LHb efferents, lesions of the RMTg, or by optogenetic inactivation of the RMTg selectively during the period when LHb neurons are activated by cocaine. Together, these results indicate that LHb/RMTg pathways contribute critically to cocaine-induced avoidance behaviors, while also participating in reciprocally inhibitory interactions with dopamine neurons.

Down-Regulation Of Amygdala and Insula Functional Circuits By Varenicline and Nicotine In Abstinent Cigarette Smokers. Sutherland MT, Carroll AJ, Salmeron BJ, Ross, TJ Hong E, Stein EA. Biological Psychiatry 2013 Mar 15. Epub ahead of print.
Although the amygdala and insula are regarded as critical neural substrates perpetuating cigarette smoking, little is known about their circuit-level interactions with interconnected regions during nicotine withdrawal or following pharmacotherapy administration. To elucidate neurocircuitry associated with early smoking abstinence, the authors examined the impact of varenicline and nicotine, two modestly efficacious pharmacologic cessation aids, on amygdala- and insula-centered circuits using resting-state functional connectivity (rsFC). In a functional magnetic resonance imaging study employing a two-drug, placebo-controlled design, 24 overnight-abstinent smokers and 20 nonsmokers

underwent ~17 days of varenicline and placebo pill administration and were scanned, on different days under each condition, wearing a transdermal nicotine or placebo patch. The authors examined the impact of varenicline and nicotine (both alone and in combination) on amygdala- and insula-centered rsFC using seed-based assessments. Beginning with a functionally defined amygdala seed, they observed that rsFC strength in an amygdala-insula circuit was down-regulated by varenicline and nicotine in abstinent smokers. Using this identified insula region as a new seed, both drugs similarly decreased rsFC between the insula and constituents of the canonical default-mode network (posterior cingulate cortex, ventromedial/dorsomedial prefrontal cortex, parahippocampus). Drug-induced rsFC modulations were critically linked with nicotine withdrawal, as similar effects were not detected in nonsmokers. These results suggest that nicotine withdrawal is associated with elevated amygdala-insula and insula-default-mode network interactions. As these potentiated interactions were down-regulated by two pharmacotherapies, this effect may be a characteristic shared by pharmacologic agents promoting smoking cessation. Decreased rsFC in these circuits may contribute to amelioration of subjective withdrawal symptoms.

Synthesis and Structure-Activity Relationship Studies of O-Biphenyl-3-yl Carbamates as Peripherally Restricted Fatty Acid Amide Hydrolase Inhibitors. Moreno-Sanz G, Duranti A, Melzig L, Fiorelli C, Ruda GF, Colombano G, Mestichelli P, Sanchini S, Tontini A, Mor M, Bandiera T, Scarpelli R, Tarzia G, Piomelli D. J Med Chem. 2013 Jul 3; epub.
The peripherally restricted fatty acid amide hydrolase (FAAH) inhibitor URB937 (3, cyclohexylcarbamic acid 3'-carbamoyl-6-hydroxybiphenyl-3-yl ester) is extruded from the brain and spinal cord by the Abcg2 efflux transporter. Despite its inability to enter the central nervous system (CNS), 3 exerts profound antinociceptive effects in mice and rats, which result from the inhibition of FAAH in peripheral tissues and the consequent enhancement of anandamide signaling at CB_1 cannabinoid receptors localized on sensory nerve endings. In the present study, the authors examined the structure-activity relationships (SAR) for the biphenyl region of compound 3, focusing on the carbamoyl and hydroxyl groups in the distal and proximal phenyl rings. Their SAR studies generated a new series of peripherally restricted FAAH inhibitors and identified compound 35 (cyclohexylcarbamic acid 3'-carbamoyl-5-hydroxybiphenyl-3-yl ester) as the most potent brain-impermeant FAAH inhibitor disclosed to date.

Class I HDAC Inhibition Blocks Cocaine-Induced Plasticity By Targeted Changes In Histone Methylation.
Kennedy PJ, Feng J, Robison AJ, Maze I, Badimon A, Mouzon E, Chaudhury D, Damez-Werno DM, Haggarty SJ, Han MH, Bassel-Duby R, Olson EN, Nestler EJ. Nat Neurosci. 2013 Apr; 16(4): 434-440.
Induction of histone acetylation in the nucleus accumbens (NAc), a key brain reward region, promotes cocaine-induced alterations in gene expression. Histone deacetylases (HDACs) tightly regulate the acetylation of histone tails, but little is known about the functional specificity of different HDAC isoforms in the development and maintenance of cocaine-induced plasticity, and previous studies of HDAC inhibitors report conflicting effects on cocaine-elicited behavioral adaptations. Here the authors demonstrate that specific and prolonged blockade of HDAC1 in NAc of mice increased global levels of histone acetylation, but also induced repressive histone methylation and antagonized cocaine-induced changes in behavior, an effect mediated in part through a chromatin-mediated suppression of GABAA receptor subunit expression and inhibitory tone on NAc neurons. These findings suggest a new mechanism by which prolonged and selective HDAC inhibition can alter behavioral and molecular adaptations to cocaine and inform the development of therapeutics for cocaine addiction.

Repeated In Vivo Exposure Of Cocaine Induces Long-Lasting Synaptic Plasticity In Hypocretin/Orexin-Producing Neurons In the Lateral Hypothalamus In Mice. Rao Y, Mineur YS, Gan G, Wang AH, Liu ZW, Wu X, Suyama S, de Lecea L, Horvath TL, Picciotto MR, Gao XB. J Physiol. 2013 Apr 1; 591(Pt 7):1951-1966.
Hypocretin (orexin), a neuropeptide synthesized exclusively in the perifornical/lateral hypothalamus, is critical for drug seeking and relapse, but it is not clear how the circuitry centered on hypocretin-producing neurons (hypocretin neurons) is modified by drugs of abuse and how changes in this circuit might alter behaviours related to drug addiction. In this study, the authors show that repeated, but not single, in vivo cocaine administration leads to a long-lasting, experience-dependent potentiation of glutamatergic synapses on hypocretin neurons in mice following a cocaine-conditioned place preference (CPP) protocol. The synaptic potentiation occurs postsynaptically and probably involves up-regulation of AMPA-type glutamate receptors on hypocretin neurons. Phosphorylation of cAMP response element-binding protein (CREB) is also significantly increased in hypocretin neurons in cocaine-treated animals, suggesting that CREB-mediated pathways may contribute to synaptic potentiation in these cells. Furthermore, the potentiation of synaptic efficacy in hypocretin neurons persists during cocaine withdrawal, but reverses to baseline levels after prolonged abstinence. Finally, the induction of long-term potentiation (LTP) triggered by a high-frequency stimulation is facilitated in hypocretin neurons in cocaine-treated mice, suggesting that long-lasting changes in synapses onto

hypocretin neurons would probably be further potentiated by other stimuli (such as concurrent environmental cues) paired with the drug. In summary, the authors show here that hypocretin neurons undergo experience-dependent synaptic potentiation that is distinct from that reported in other reward systems, such as the ventral tegmental area, following exposure to cocaine. These findings support the idea that the hypocretin system is important for behavioural changes associated with cocaine administration in animals and humans.

White Matter Alterations at 33-Year Follow-Up in Adults with Childhood Attention-Deficit/Hyperactivity Disorder. Cortese S, Imperati D, Zhou J, Proal E, Klein RG, Mannuzza S, Ramos-Olazagasti MA, Milham MP, Kelly C, Castellanos FX. Biol Psychiatry. 2013 Apr 5. [Epub ahead of print].
Attention-deficit/hyperactivity disorder (ADHD) is increasingly conceived as reflecting altered functional and structural brain connectivity. The latter can be addressed with diffusion tensor imaging (DTI). The authors examined fractional anisotropy (FA), a DTI index related to white matter structural properties, in adult male subjects diagnosed with ADHD in childhood (probands) and matched control subjects without childhood ADHD. Additionally, they contrasted FA among probands with and without current ADHD in adulthood and control subjects. Participants were from an original cohort of 207 boys and 178 male control subjects. At 33-year follow-up, analyzable DTI scans were obtained in 51 probands (41.3±2.8 yrs) and 66 control subjects (41.2±3.1 yrs). Voxel-based FA was computed with tract-based spatial statistics, controlling for multiple comparisons. Probands with childhood ADHD exhibited significantly lower FA than control subjects without childhood ADHD in the right superior and posterior corona radiata, right superior longitudinal fasciculus, and in a left cluster including the posterior thalamic radiation, the retrolenticular part of the internal capsule, and the sagittal stratum ($p<.05$, corrected). Fractional anisotropy was significantly decreased relative to control subjects in several tracts in both probands with current and remitted ADHD, who did not differ significantly from each other. Fractional anisotropy was not significantly increased in probands in any region. Decreased FA in adults with childhood ADHD regardless of current ADHD might be an enduring trait of ADHD. White matter tracts with decreased FA connect regions involved in high-level as well as sensorimotor functions, suggesting that both types of processes are involved in the pathophysiology of ADHD.

Opioid Receptor Polymorphism A118G Associated with Clinical Severity in a Drug Overdose Population. Manini AF, Jacobs MM, Vlahov D, Hurd YL. J Med Toxicol. 2013 Jun; 9(2): 148-154.
Genetic variations in the human mu-opioid receptor gene (OPRM1) mediate individual differences in response to pain and opiate addiction. The authors studied whether the common A118G (rs1799971) mu-opioid receptor single nucleotide polymorphism (SNP) was associated with overdose severity in humans. In addition, they examined an SNP responsible for alternative splicing of OPRM1 (rs2075572). The authors assessed allele frequencies of the above SNPs and associations with clinical severity in patients presenting to the emergency department (ED) with acute drug overdose. This work was designed as an observational cohort study over a 12-month period at an urban teaching hospital. Participants consisted of consecutive adult ED patients with suspected acute drug overdose for whom discarded blood samples were available for analysis. Specimens were linked with clinical variables (demographics, urine toxicology screens, clinical outcomes) then deidentified prior to genetic SNP analysis. Blinded genotyping was performed after standard DNA purification and whole genome amplification. In-hospital severe outcomes were defined as either respiratory arrest (RA; defined by mechanical ventilation) or cardiac arrest (CA; defined by loss of pulse). The authors analyzed 179 patients (61% male, median age 32) who overall suffered 15 RAs and four CAs, of whom three died. The 118G allele conferred 5.3-fold increased odds of CA/RA ($p<0.05$), while the rs2075572 variant allele was not associated with CA/RA. The 118G variant allele in the OPRM1 gene is associated with worse clinical severity in patients with acute drug overdose. These findings mark the first time that the 118G variant allele is linked with clinical drug overdose vulnerability.

Longitudinal Changes In Engagement In Care and Viral Suppression For HIV-Infected Injection Drug Users. Westergaard RP, Hess T, Astemborski J, Mehta SH, Kirk GD. AIDS 2013 June; Epub ahead of print.
The objective of this study was to examine temporal trends and predictors of linkage to HIV care, longitudinal retention in care and viral suppression among injection drug users (IDUs) infected with HIV. The design was a community-based, prospective cohort study. The authors prospectively studied 790 HIV-infected IDUs participating in the AIDS Linked to the Intravenous Experience (ALIVE) study from 1998 through 2011. IDUs were considered linked to care if they attended any HIV care visit during follow-up and retained in care if they reported HIV clinic attendance at every semiannual study visit. The authors used logistic regression to identify predictors of poor retention in care and failure to achieve sustained viral suppression in response to ART. Of 790 HIV-infected IDUs studied, 740 (93.6%) were ever linked to care. The majority of IDUs (76.7%) received ART at some point during observation and of these most (85.4%) achieved viral suppression. However, over a median of 8.7 years of follow-up, only 241 (30.5%) IDUs were

continuously retained with no 6-month lapses in HIV care and only 63 (10.2%) had sustained viral suppression at every study visit after first receiving ART. Suboptimal engagement in care was associated with poor access to medical care, active drug use, and incarceration. The authors conclude that compared to national estimates of retention in care and virologic suppression in the United States, IDUs are substantially less likely to remain fully engaged in HIV care. Strategies to optimize HIV care should acknowledge the elevated risk of poor engagement in care among IDUs.

An Intronic Variant in OPRD1 Predicts Treatment Outcome for Opioid Dependence in African-Americans. Crist RC, Clarke TK, Ang A, Ambrose-Lanci LM, Lohoff FW, Saxon AJ, Ling W, Hillhouse MP, Bruce RD, Woody G, Berrettini WH. Neuropsychopharmacology. 2013 Apr 23. [Epub ahead of print].
Although buprenorphine and methadone are both effective treatments for opioid dependence, their efficacy can vary significantly among patients. Genetic differences may explain some of the variability in treatment outcome. Understanding the interactions between genetic background and pharmacotherapy may result in more informed treatment decisions. This study is a pharmacogenetic analysis of the effects of genetic variants in OPRD1, the gene encoding the δ-opioid receptor, on the prevalence of opioid-positive urine tests in African-Americans (n=77) or European-Americans (n=566) undergoing treatment for opioid dependence. Patients were randomly assigned to treatment with either methadone or buprenorphine/naloxone (Suboxone) over a 24-week open-label clinical trial, in which illicit opioid use was measured by weekly urinalysis. In African-Americans, the intronic SNP rs678849 predicted treatment outcome for both medications. Methadone patients with the CC genotype were less likely to have opioid-positive urine tests than those in the combined CT and TT genotypes group (relative risk (RR)=0.52, 95% confidence interval (CI)=0.44-0.60, p=0.001). In the buprenorphine treatment group, however, individuals with the CC genotype were more likely to have positive opioid drug screens than individuals in the combined CT and TT genotypes group (RR=2.17, 95% CI=1.95-2.68, p=0.008). These findings indicate that the genotype at rs678849 predicts African-American patient response to two common treatments for opioid dependence, suggesting that matching patients to treatment type based on the genotype at this locus may improve overall treatment efficacy. This observation requires confirmation in an independent population.

Neuroeconomics and Adolescent Substance Abuse: Individual Differences in Neural Networks and Delay Discounting. Stanger C, Elton A, Ryan SR, James GA, Budney AJ, Kilts CD. J Am Acad Child Adolesc Psychiatry. 2013 Jul; 52(7): 747-755.
Many adolescents with substance use problems show poor response to evidence-based treatments. Treatment outcome has been associated with individual differences in impulsive decision making as reflected by delay discounting (DD) rates (preference for immediate rewards). Adolescents with higher rates of DD were expected to show greater neural activation in brain regions mediating impulsive/habitual behavioral choices and less activation in regions mediating reflective/executive behavioral choices. Thirty adolescents being treated for substance abuse completed a DD task optimized to balance choices of immediate versus delayed rewards, and a control condition accounted for activation during magnitude valuation. A group independent component analysis on functional magnetic resonance imaging time courses identified neural networks engaged during DD. Network activity was correlated with individual differences in discounting rate. Higher discounting rates were associated with diminished engagement of an executive attention control network involving the dorsolateral prefrontal cortex, dorsomedial prefrontal cortex, inferior parietal cortex, cingulate cortex, and precuneus. Higher discounting rates also were associated with less deactivation in a "bottom-up" reward valuation network involving the amygdala, hippocampus, insula, and ventromedial prefrontal cortex. These 2 networks were significantly negatively correlated. Results support relations between competing executive and reward valuation neural networks and temporal decision making, an important, potentially modifiable risk factor relevant for the prevention and treatment of adolescent substance abuse.

Comparison of the Analgesic Effects of Dronabinol and Smoked Marijuana in Daily Marijuana Smokers. Cooper ZD, Comer SD, Haney M. Neuropsychopharm 2013 Apr 22. [Epub ahead of print].
Recent studies have demonstrated the therapeutic potential of cannabinoids to treat pain, yet none have compared the analgesic effectiveness of smoked marijuana to orally administered Δ9-tetrahydrocannabinol (THC; dronabinol). This randomized, placebo-controlled, double-dummy, double-blind study compared the magnitude and duration of analgesic effects of smoked marijuana and dronabinol under well-controlled conditions using a validated experimental model of pain. Healthy male (N=15) and female (N=15) daily marijuana smokers participated in this outpatient study comparing the analgesic, subjective, and physiological effects of marijuana (0.00, 1.98, or 3.56% THC) to dronabinol (0, 10, or 20 mg). Pain response was assessed using the cold-pressor test (CPT): participants immersed their left hand in cold water (4°C), and the time to report pain (pain sensitivity) and withdraw the hand from the water (pain tolerance) were recorded. Subjective pain and drug effect ratings were also measured as well as cardiovascular effects. Compared with

placebo, marijuana and dronabinol decreased pain sensitivity (3.56%; 20 mg), increased pain tolerance (1.98%; 20 mg), and decreased subjective ratings of pain intensity (1.98, 3.56%; 20 mg). The magnitude of peak change in pain sensitivity and tolerance did not differ between marijuana and dronabinol, although dronabinol produced analgesia that was of a longer duration. Marijuana (1.98, 3.56%) and dronabinol (20 mg) also increased abuse-related subjective ratings relative to placebo; these ratings were greater with marijuana. These data indicate that under controlled conditions, marijuana and dronabinol decreased pain, with dronabinol producing longer-lasting decreases in pain sensitivity and lower ratings of abuse-related subjective effects than marijuana.

Content Matters: Neuroimaging Investigation of Brain and Behavioral Impact of Televised Anti-Tobacco Public Service Announcements. Wang AL, Ruparel K, Loughead JW, Strasser AA, Blady SJ, Lynch KG, Romer D, Cappella JN, Lerman C, Langleben DD. J Neurosci 2013; 33(17): 7420-7427.
Televised public service announcements are video ads that are a key component of public health campaigns against smoking. Understanding the neurophysiological correlates of anti-tobacco ads is an important step toward novel objective methods of their evaluation and design. In the present study, the authors used functional magnetic resonance imaging (fMRI) to investigate the brain and behavioral effects of the interaction between content ("argument strength," AS) and format ("message sensation value," MSV) of anti-smoking ads in humans. Seventy-one nontreatment-seeking smokers viewed a sequence of 16 high or 16 low AS ads during an fMRI scan. Dependent variables were brain fMRI signal, the immediate recall of the ads, the immediate change in intentions to quit smoking, and the urine levels of a major nicotine metabolite cotinine at a 1 month follow-up. Whole-brain ANOVA revealed that AS and MSV interacted in the inferior frontal, inferior parietal, and fusiform gyri; the precuneus; and the dorsomedial prefrontal cortex (dMPFC). Regression analysis showed that the activation in the dMPFC predicted the urine cotinine levels 1 month later. These results characterize the key brain regions engaged in the processing of persuasive communications and suggest that brain fMRI response to anti-smoking ads could predict subsequent smoking severity in nontreatment-seeking smokers. These findings demonstrate the importance of the quality of content for objective ad outcomes and suggest that fMRI investigation may aid the prerelease evaluation of televised public health ads.

Estimating the Prevalence of Opioid Diversion by ‘‘Doctor Shoppers’’ in the United States. McDonald DC, Carlson KE. PLoS ONE 2013; 8(7): e69241.
Abuse of prescription opioid analgesics is a serious threat to public health, resulting in rising numbers of overdose deaths and admissions to emergency departments and treatment facilities. Absent adequate patient information systems, ‘‘doctor shopping’’ patients can obtain multiple opioid prescriptions for nonmedical use from different unknowing physicians. The present study estimates the prevalence of doctor shopping in the US and the amounts and types of opioids involved. The sample included records for 146.1 million opioid prescriptions dispensed during 2008 by 76% of US retail pharmacies. Prescriptions were linked to unique patients and weighted to estimate all prescriptions and patients in the nation. Finite mixture models were used to estimate different latent patient populations having different patterns of using prescribers. On average, patients in the extreme outlying population (0.7% of purchasers), presumed to be doctor shoppers, obtained 32 opioid prescriptions from 10 different prescribers. They bought 1.9% of all opioid prescriptions, constituting 4% of weighed amounts dispensed. These data did not provide information to make a clinical diagnosis of individuals. Very few of these patients can be classified with certainty as diverting drugs for nonmedical purposes. However, even patients with legitimate medical need for opioids who use large numbers of prescribers may signal dangerously uncoordinated care. To close the information gap that makes doctor shopping and uncoordinated care possible, states have created prescription drug monitoring programs to collect records of scheduled drugs dispensed, but the majority of physicians do not access this information. To facilitate use by busy practitioners, most monitoring programs should improve access and response time, scan prescription data to flag suspicious purchasing patterns and alert physicians and pharmacists. Physicians could also prevent doctor shopping by adopting procedures to screen new patients for their risk of abuse and to monitor patients’ adherence to prescribed treatments.

Missed Opportunities for Hepatitis C Testing in Opioid Treatment Programs. Frimpong JA. Am J Public Health. Published online ahead of print April 18, 2013: e1–e3. .
HCV has surpassed HIV as a cause of death in the United States and is particularly prevalent among injection drug users. I examined the availability of on-site HCV testing in a nationally representative sample of opioid treatment programs. Nearly 68% of these programs had the staff required for HCV testing, but only 34% offered on-site testing. Availability of on-site testing increased only slightly with the proportion of injection drug users among clients. The limited HCV testing services in opioid treatment programs is a key challenge to reducing HCV in the US population.

Mapping Common Psychiatric Disorders: Structure and Predictive Validity in the National Epidemiologic Survey on Alcohol and Related Conditions. Blanco C, Krueger R, Hasin D, Liu S, Wang S, Kerridge B, Saha T, Olfson M. JAMA Psychiatry. 2013; 70(2): 199-208.
Clinical experience and factor analytic studies suggest that some psychiatric disorders may be more closely related to one another, as indicated by the frequency of their co-occurrence, which may have etiologic and treatment implications. The objective of this study was to construct a virtual space of common psychiatric disorders, spanned by factors reflecting major psychopathologic dimensions, and locate psychiatric disorders in that space, as well as to examine whether the location of disorders at baseline predicts the prevalence and incidence of disorders at 3-year follow-up. A total of 34,653 individuals participated in waves 1 and 2 of the National Epidemiologic Survey on Alcohol and Related Conditions. The distance between disorders at wave 1, calculated using the loadings of the factors spanning the space of disorders as coordinates. This distance was correlated with the adjusted odds ratios for age, sex, and race/ethnicity of the prevalence and incidence of Axis I disorders in wave 2, with the aim of determining whether smaller distances between disorders at wave 1 predicts higher disorder prevalence and incidence at wave 2. A model with 3 correlated factors provided an excellent fit (Comparative Fit Index = 0.99, Tucker-Lewis Index = 0.98, root mean square error of approximation = 0.008) for the structure of common psychiatric disorders and was used to span the space of disorders. Distances ranged from 0.070 (between drug abuse and alcohol dependence) to 1.032 (between drug abuse and dysthymia). The correlation of distance between disorders in wave 1 with adjusted odds ratios of prevalence in wave 2 was -0.56. The correlation of distance in wave 1 with adjusted odds ratios of incidence in wave 2 was -0.57. The authors conclude that mapping psychiatric disorders can be used to quantify the distances among disorders. Proximity in turn can be used to predict prospectively the incidence and prevalence of Axis I disorders.

Early Smoking Onset and Risk For Subsequent Nicotine Dependence: A Monozygotic Co-Twin Control Study. Kendler KS, Myers J, Damaj MI, Chen, X. Am J Psychiatry. 2013; 170 (4): 408-413.
Early onset of regular smoking is associated with an elevated risk for later nicotine dependence. Whether or not this association is causal is unknown and has substantial public policy implications. The authors used a monozygotic co-twin control study design. Pairs were selected from the Virginia Adult Twin Study of Psychiatric and Substance Use Disorders for discordance in age at onset of regular smoking. Nicotine dependence was measured by the Fagerstrom test for nicotine dependence and level of craving. The authors identified 175 male-male and 69 female-female monozygotic twin pairs who differed by at least 2 years in age at onset of regular smoking. During their period of heaviest smoking, the twin who began smoking earlier had significantly higher Fagerstrom test scores in both the male-male (Cohen's d=0.20) and female-female twin pairs (d=0.26). Craving for cigarettes when unable to smoke was also higher in the early-onset member in both groups (male pairs, d=0.38; female pairs, d=0.25). The early-onset smoking twin did not differ from the later-onset twin in symptoms of alcohol or cannabis abuse or dependence, current alcohol use, or maximal level of cannabis, sedative, stimulant, or cocaine use. Controlling for genetic and familial-environmental effects, age at onset of regular smoking predicted level of nicotine dependence. Consistent with the animal literature, these findings suggest that in humans, early nicotine exposure directly increases level of later nicotine dependence. These results should be interpreted in the context of the methodological strengths and limitations of the monozygotic co-twin design.

Amygdala-Dependent Fear Is Regulated by Oprl1 in Mice and Humans with PTSD. Andero R, Brothers SP, Jovanovic T, Chen YT, Salah-Uddin H, Cameron M, Bannister TD, Almli L, Stevens JS, Bradley B, Binder EB, Wahlestedt C, Ressler KJ. Sci Transl Med. 2013 Jun 5;5(188):188ra73.
The amygdala-dependent molecular mechanisms driving the onset and persistence of posttraumatic stress disorder (PTSD) are poorly understood. Recent observational studies have suggested that opioid analgesia in the aftermath of trauma may decrease the development of PTSD. Using a mouse model of dysregulated fear, the authors found altered expression within the amygdala of the Oprl1 gene (opioid receptor-like 1), which encodes the amygdala nociceptin (NOP)/orphanin FQ receptor (NOP-R). Systemic and central amygdala infusion of SR-8993, a new highly selective NOP-R agonist, impaired fear memory consolidation. In humans, a single-nucleotide polymorphism (SNP) within OPRL1 is associated with a self-reported history of childhood trauma and PTSD symptoms (n = 1847) after a traumatic event. This SNP is also associated with physiological startle measures of fear discrimination and magnetic resonance imaging analysis of amygdala-insula functional connectivity. Together, these data suggest that Oprl1 is associated with amygdala function, fear processing, and PTSD symptoms. Further, these data suggest that activation of the Oprl1/NOP receptor may interfere with fear memory consolidation, with implications for prevention of PTSD after a traumatic event.

Adenovirus Capsid-Based Anti-Cocaine Vaccine Prevents Cocaine from Binding to the Nonhuman Primate CNS Dopamine Transporter. Maoz A, Hicks MJ, Vallabhjosula S, Synan M, Kothari PJ, Dyke JP, Ballon DJ, Kaminsky SM, De BP, Rosenberg JB, Martinez D, Koob GF, Janda KD, Crystal RG. Neuropsychopharmacology. 2013 May 10.
Cocaine addiction is a major problem for which there is no approved pharmacotherapy. The authors have developed a vaccine to cocaine (dAd5GNE), based on the cocaine analog GNE linked to the capsid proteins of a serotype 5 adenovirus, designed to evoke anti-cocaine antibodies that sequester cocaine in the blood, preventing access to the CNS. To assess the efficacy of dAd5GNE in a large animal model, positron emission tomography (PET) and the radiotracer [11C]PE2I were used to measure cocaine occupancy of the dopamine transporter (DAT) in nonhuman primates. Repeat administration of dAd5GNE induced high anti-cocaine titers. Before vaccination, cocaine displaced PE2I from DAT in the caudate and putamen, resulting in 62±4% cocaine occupancy. In contrast, dAd5GNE-vaccinated animals showed reduced cocaine occupancy such that when anti-cocaine titers were >4 × 105, the cocaine occupancy was reduced to levels of <20%, significantly below the 47% threshold required to evoke the subjective 'high' reported in humans.

Cortical Activation Of Accumbens Hyperolarization-Action Nmdars Mediates Aversion-Resistant Alcohol Intake. Seif T, Chang S, Simms JA, Gibb SL, Dadgar J, Chen BT, Harvey BK, Ron D, Messing RO, Bonci A. Nat Neurosci 2013, e-pub June 30, 2013.
Compulsive drinking despite serious adverse medical, social and economic consequences is a characteristic of alcohol use disorders in humans. Although frontal cortical areas have been implicated in alcohol use disorders, little is known about the molecular mechanisms and pathways that sustain aversion-resistant intake. Here, the authors show that nucleus accumbens core (NAcore) NMDA-type glutamate receptors and medial prefrontal (mPFC) and insula glutamatergic inputs to the NAcore are necessary for aversion-resistant alcohol consumption in rats. Aversion-resistant intake was associated with a new type of NMDA receptor adaptation, in which hyperpolarization-active NMDA receptors were present at mPFC and insula but not amygdalar inputs in the NAcore. Accordingly, inhibition of Grin2c NMDA receptor subunits in the NAcore reduced aversion-resistant alcohol intake. None of these manipulations altered intake when alcohol was not paired with an aversive consequence. These results identify a mechanism by which hyperpolarization-active NMDA receptors under mPFC- and insula-to-NAcore inputs sustain aversion-resistant alcohol intake.

In Vivo Characterization Of the Highly Selective Monoacylglycerol Lipase Inhibitor KML29: Antinociceptive Activity Without Cannabimimetic Side Effects. Ignatowska-Jankowska BM, Ghosh S, Crowe MS, Kinsey SG, Niphakis MJ, Abdullah RA, Tao Q, O'Neal ST, Walentiny DM, Wiley JL, Cravatt BF, Lichtman AH. Br J Pharmacol. 2013 Jul 12; Epub.
Since monoacylglycerol lipase (MAGL) has been firmly established as the predominant catabolic enzyme of the endocannabinoid 2-arachidonoylglycerol (2-AG), a great need has emerged for the development of highly selective MAGL inhibitors. Here, the authors tested the in vivo effects of one such compound, KML29. In the present study, the authors tested KML29 in murine inflammatory (i.e. carrageenan) and sciatic nerve injury pain models, as well as the diclofenac-induced gastric hemorrhage model. KML29 was also evaluated for cannabimimetic effects, including measurements of locomotor activity, body temperature, catalepsy, and cannabinoid interoceptive effects in the drug discrimination paradigm. KML29 attenuated carrageenan-induced paw edema and completely reversed carrageenan-induced mechanical allodynia. These effects underwent tolerance after repeated administration of high-dose KML29, which were accompanied by CB1 receptor desensitization. Acute or repeated KML29 administration increased 2-AG levels and concomitantly reduced arachidonic acid levels, but without elevating anandamide (AEA) levels in the whole brain. Furthermore, KML29 partially reversed allodynia in the sciatic nerve injury model and completely prevented diclofenac-induced gastric hemorrhages. CB1 and CB2 receptors played differential roles in these pharmacological effects of KML29. In contrast, KML29 did not elicit cannabimimetic effects, including catalepsy, hypothermia, and hypomotility. Although KML29 did not substitute for THC in C57BL/6J mice, it fully and dose-dependantly substituted for AEA in FAAH(‰/‰) mice, consistent with previous work showing that dual FAAH and MAGL inhibition produces THC-like subjective effects. These results indicate that KML29, a highly selective MAGL inhibitor, reduces inflammatory and neuropathic nociceptive behavior without occurrence of cannabimimetic side effects.

Subjective Costs Drive Overly Patient Foraging Strategies In Rats On An Intertemporal Foraging Task. Wikenheiser AM, Stephens DW, Redish AD. Proc Natl Acad Sci U S A. 2013 May 14; 110(20): 8308-8313.
Laboratory studies of decision making often take the form of two-alternative, forced-choice paradigms. In natural settings, however, many decision problems arise as stay/go choices. The authors designed a foraging task to test intertemporal decision making in rats via stay/go decisions. Subjects did not follow the rate-maximizing strategy of choosing only food items associated with short delays. Instead, rats were often willing to wait for surprisingly long

periods, and consequently earned a lower rate of food intake than they might have by ignoring long-delay options. The authors tested whether foraging theory or delay discounting models predicted the behavior they observed but found that these models could not account for the strategies subjects selected. Subjects' behavior was well accounted for by a model that incorporated a cost for rejecting potential food items. Interestingly, subjects' cost sensitivity was proportional to environmental richness. These findings are at odds with traditional normative accounts of decision making but are consistent with retrospective considerations having a deleterious influence on decisions (as in the "sunk-cost" effect). More broadly, these findings highlight the utility of complementing existing assays of decision making with tasks that mimic more natural decision topologies.

Posttraining Optogenetic Manipulations Of Basolateral Amygdala Activity Modulate Consolidation Of Inhibitory Avoidance Memory In Rats. Huff ML, Miller RL, Deisseroth K, Moorman DE, LaLumiere RT. Proc Natl Acad Sci U S A. 2013 Feb 26; 110(9): 3597-3602.
Memory consolidation studies, including those examining the role of the basolateral amygdala (BLA), have traditionally used techniques limited in their temporal and spatial precision. The development of optogenetics provides increased precision in the control of neuronal activity that can be used to address the temporal nature of the modulation of memory consolidation. The present experiments, therefore, investigated whether optogenetically stimulating and inhibiting BLA activity immediately after training on an inhibitory avoidance task enhances and impairs retention, respectively. The BLA of male Sprague-Dawley rats was transduced to express either ChR2(E123A) or archaerhodopsin-3 from the Halorubrum sodomense strain TP009 (ArchT). Immediately after inhibitory avoidance training, rats received optical stimulation or inhibition of the BLA, and 2 d later, rats' retention was tested. Stimulation of ChR2(E123A)-expressing neurons in the BLA using trains of 40-Hz light pulses enhanced retention, consistent with recording studies suggesting the importance of BLA activity at this frequency. Light pulses alone given to control rats had no effect on retention. Inhibition of ArchT-expressing neurons in the BLA for 15 min, but not 1 min, significantly impaired retention. Again, illumination alone given to control rats had no effect on retention, and BLA inhibition 3 h after training had no effect. These findings provide critical evidence of the importance of specific frequency patterns of activity in the BLA during consolidation and indicate that optogenetic manipulations can be used to alter activity after a learning event to investigate the processes underlying memory consolidation.

A Strategy To Capture and Characterize the Synaptic Transcriptome. Puthanveettil SV, Antonov I, Kalachikov S, Rajasethupathy P, Choi YB, Kohn AB, Citarella M, Yu F, Karl KA, Kinet M, Morozova I, Russo JJ, Ju J, Moroz LL, Kandel ER. Proc Natl Acad Sci U S A. 2013 Apr 30; 110(18): 7464-7469.
Here the authors describe a strategy designed to identify RNAs that are actively transported to synapses during learning. Their approach is based on the characterization of RNA transport complexes carried by molecular motor kinesin. Using this strategy in Aplysia, the authors have identified 5,657 unique sequences consisting of both coding and noncoding RNAs from the CNS. Several of these RNAs have key roles in the maintenance of synaptic function and growth. One of these RNAs, myosin heavy chain, is critical in presynaptic sensory neurons for the establishment of long-term 4, but not for its persistence.

Pain after Discontinuation of Morphine Treatment Is Associated with Synaptic Increase of GluA4-Containing AMPAR in the Dorsal Horn of the Spinal Cord. Cabañero D, Baker A, Zhou S, Hargett GL, Irie T, Xia Y, Beaudry H, Gendron L, Melyan Z, Carlton SM, Morón JA. Neuropsychopharmacology. 2013 Jul; 38(8): 1472-1484.
Withdrawal from prescribed opioids results in increased pain sensitivity, which prolongs the treatment. This pain sensitivity is attributed to neuroplastic changes that converge at the spinal cord dorsal horn. The authors have recently reported that repeated morphine administration triggers an insertion of GluA2-lacking (Ca(2+)-permeable) α-amino-3-hydroxy-5-methyl-4-isoxazole propionic acid receptors (AMPAR) in the hippocampus. This finding together with the reported involvement of AMPAR in the mechanisms underlying inflammatory pain led the authors to hypothesize a role for spinal AMPAR in opioid-induced pain behavior. Mice treated with escalating doses of morphine showed hypersensitivity to mechanical stimulation. Intrathecal administration of a Ca(2+)-permeable AMPAR selective blocker disrupted morphine-induced mechanical sensitivity. Analysis of the expression and phosphorylation levels of AMPAR subunits (GluA1/2/3/4) in homogenates and in postsynaptic density fractions from spinal cord dorsal horns showed an increase in GluA4 expression and phosphorylation in the postsynaptic density after morphine. Co-immunoprecipitation analyses suggested an increase in GluA4 homomers (Ca(2+)-permeable AMPAR) and immunohistochemical staining localized the increase in GluA4 levels in laminae III-V. The excitatory postsynaptic currents (EPSCs) recorded in laminae III-V showed enhanced sensitivity to Ca(2+)-permeable AMPAR blockers in morphine-treated mice. Furthermore, current-voltage relationships of AMPAR-mediated EPSCs showed that rectification index (an indicator of Ca(2+)-permeable AMPAR contribution) is increased in morphine-treated but not in saline-treated mice. These effects

could be reversed by infusion of GluA4 antibody through patch pipette. This is the first direct evidence for a role of GluA4-containing AMPAR in morphine-induced pain and highlights spinal GluA4-containing AMPAR as targets to prevent the morphine-induced pain sensitivity.

The Volitional Nature Of Nicotine Exposure Alters Anandamide and Oleoylethanolamide Levels In the Ventral Tegmental Area. Buczynski MW, Polis IY, Parsons LH. Neuropsychopharmacology. 2013 Mar; 38(4): 574-584.
Cannabinoid-1 receptors (CB(1)) have an important role in nicotine reward and their function is disrupted by chronic nicotine exposure, suggesting nicotine-induced alterations in endocannabinoid (eCB) signaling. However, the effects of nicotine on brain eCB levels have not been rigorously evaluated. Volitional intake of nicotine produces physiological and behavioral effects distinct from forced drug administration, although the mechanisms underlying these effects are not known. This study compared the effects of volitional nicotine self-administration (SA) and forced nicotine exposure (yoked administration (YA)) on levels of eCBs and related neuroactive lipids in the ventral tegmental area (VTA) and other brain regions. Brain lipid levels were indexed both by in vivo microdialysis in the VTA and lipid extractions from brain tissues. Nicotine SA, but not YA, reduced baseline VTA dialysate oleoylethanolamide (OEA) levels relative to nicotine-naïve controls, and increased anandamide (AEA) release during nicotine intake. In contrast, all nicotine exposure paradigms increased VTA dialysate 2-arachidonoyl glycerol (2-AG) levels. Thus, nicotine differentially modulates brain lipid (2-AG, AEA, and OEA) signaling, and these modulations are influenced by the volitional nature of the drug exposure. Corresponding bulk tissue analysis failed to identify these lipid changes. Nicotine exposure had no effect on fatty acid amide hydrolase activity in the VTA, suggesting that changes in AEA and OEA signaling result from alterations in their nicotine-induced biosynthesis. Both CB(1) (by AEA and 2-AG) and non-CB(1) (by OEA) targets can alter the excitability and activity of the dopaminergic neurons in the VTA. Collectively, these findings implicate disrupted lipid signaling in the motivational effects of nicotine.

Self-regulatory Depletion Increases Emotional Reactivity in the Amygdala. Wagner DD, Heatherton TF. Social Cognitive and Affective Neuroscience 2013; 8(4): 410–417.
The ability to self-regulate can become impaired when people are required to engage in successive acts of effortful self-control, even when self-control occurs in different domains. Here, the authors used functional neuroimaging to test whether engaging in effortful inhibition in the cognitive domain would lead to putative dysfunction in the emotional domain. Forty-eight participants viewed images of emotional scenes during functional magnetic resonance imaging in two sessions that were separated by a challenging attention control task that required effortful inhibition (depletion group) or not (control group). Compared to the control group, depleted participants showed increased activity in the left amygdala to negative but not to positive or neutral scenes. Moreover, whereas the control group showed reduced amygdala activity to all scene types (i.e. habituation), the depletion group showed increased amygdala activity relative to their pre-depletion baseline; however this was only significant for negative scenes. Finally, depleted participants showed reduced functional connectivity between the left amygdala and ventromedial prefrontal cortex during negative scene processing. These findings demonstrate that consuming self-regulatory resources leads to an exaggerated neural response to emotional material that appears specific to negatively valenced stimuli and further suggests a failure to recruit top-down prefrontal regions involved in emotion regulation.

Differentially Regulated Gene Expression Associated With Hepatitis C Virus Clearance. Grimes CZ, Hwang LY, Wei P, Shah DP, Volcik KA, Brown EL. J Gen Virol. 2013; 94(Pt 3): 534-542.
Human chronic hepatitis C virus (HCV) infections pose a significant public health threat, necessitating the development of novel treatments and vaccines. HCV infections range from spontaneous resolution to end-stage liver disease. Approximately 10-30% of HCV infections undergo spontaneous resolution independent of treatment by yet-to-be-defined mechanisms. These individuals test positive for anti-HCV antibodies in the absence of detectable viral serum RNA. To identify genes associated with HCV clearance, this study compared gene expression profiles between current drug users chronically infected with HCV and drug users who cleared their HCV infection. This analysis identified 91 differentially regulated (up- or down regulated by twofold or more) genes potentially associated with HCV clearance. The majority of genes identified were associated with immune function, with the remaining genes categorized either as cancer related or ‘other’. Identification of factors and pathways that may influence virus clearance will be essential to the development of novel treatment strategies.

Drug Use Patterns and Continuous Enrollment In College: Results From A Longitudinal Study. Arria AM, Garnier-Dykstra LM, Caldeira KM, Vincent KB, Winick ER, O'Grady KE. J Stud Alcohol Drugs. 2013; 74(1): 71-83.
Few longitudinal studies have examined the relationship between illicit drug use and academic outcomes among college students. This study characterized drug use patterns of a cohort of young adults who were originally enrolled as first-

time, first-year college students in a longitudinal study. It evaluated the association between these drug use patterns and continuous enrollment during college, holding constant demographic characteristics, high school grade point average, fraternity/sorority involvement, personality/temperament characteristics, nicotine dependence, and alcohol use disorder. Participants (n = 1,133; 47% male) were purposively selected from one university and interviewed annually for 4 years, beginning with their first year of college, regardless of continued college attendance. Enrollment data were culled from administrative records. Group-based trajectory analyses characterized 4-year longitudinal drug use patterns. Two grouping variables were derived based on (a) marijuana use frequency and (b) number of illicit drugs used other than marijuana. Seventy-one percent of the sample was continuously enrolled in the home institution during the first 4 years of study. Multivariable logistic regression models demonstrated that infrequent, increasing, and chronic/heavy marijuana use patterns were significantly associated with discontinuous enrollment (adjusted odds ratio = 1.66, 1.74, and 1.99, respectively), compared with minimal use, holding constant covariates. In separate models, drug use other than marijuana also was significantly associated with discontinuous enrollment. Marijuana use and other illicit drug use are both associated with a decreased likelihood of continuous enrollment in college, independent of several other possible risk factors. These findings highlight the need for early intervention with illicit drug users to mitigate possible negative academic consequences.

Multiple Behavior Interventions to Prevent Substance Abuse and Increase Energy Balance Behaviors in Middle School Students. Velicer W, Redding C, Paiva A, Mauriello L, Blissmer B, Oatley K, Meier K, Babbin S, McGee H, Prochaska J, Burditt C, Fernandez A. Transl Behav Med. 2013; 3(1): 82-93.
This study examined the effectiveness of two transtheoretical model-tailored, computer-delivered interventions designed to impact multiple substance use or energy balance behaviors in a middle school population recruited in schools. Twenty middle schools in Rhode Island including sixth grade students (N=4,158) were stratified and randomly assigned by school to either a substance use prevention (decreasing smoking and alcohol) or an energy balance (increasing physical activity, fruit and vegetable consumption, and limiting TV time) intervention group in 2007. Each intervention involved five in-class contacts over a 3-year period with assessments at 12, 24, and 36 months. Main outcomes were analyzed using random effects modeling. In the full energy balance group and in subsamples at risk and not at risk at baseline, strong effects were found for physical activity, healthy diet, and reducing TV time, for both categorical and continuous outcomes. Despite no direct treatment, the energy balance group also showed significantly lower smoking and alcohol use over time than the substance use prevention group. The energy balance intervention demonstrated strong effects across all behaviors over 3 years among middle school students. The substance use prevention intervention was less effective than the energy balance intervention in preventing both smoking and alcohol use over 3 years in middle school students. The lack of a true control group and unrepresented secular trends suggest the need for further study.

Toward Population Impact from Home Visiting. Dodge K, Goodman W, Murphy R, O 'Donnell K, Sato J. Zero Three. 2013; 33(3): 17-23.
Although some home-visiting programs have proven effective with the families they serve, no program has yet demonstrated an impact at the population level. The authors describe the Durham Connects (DC) initiative, which aims to achieve population impact by coalescing community agencies to serve early-intervention goals through a Preventive System Of Care and by delivering a universal, short-term, postnatal nurse home-visiting program. The home-visitor delivers brief intervention, assesses family needs in 12 domains, and connects the family with community resources to address individualized family needs. Evaluation of DC occurred through a population randomized controlled trial of all 4,777 births in Durham, NC, over an 18-month period. DC was implemented with high penetration and high fidelity. Impact evaluation indicated that by age 6 months, DC infants had 18 percent fewer emergency room visits and 80 percent fewer overnights in the hospital than did control families. The authors conclude that population impact is achievable if a program attends to challenges of community partnership, universal reach and assessment, rigorous evaluation, and models for sustaining funding.

Suppression Of Nicotine-Induced Pathophysiology By An Adenovirus Hexon-Based Antinicotine Vaccine. Rosenberg JB, De BP, Hicks MJ, Janda KD, Kaminsky SM, Worgall S, Crystal RG. Hum Gene Ther. 2013 Jun; 24(6): 595-603.
Despite antismoking campaigns, cigarette smoking remains a pervasive addiction with significant societal impact, accounting for one of every five deaths. Smoking cessation therapies to help smokers quit are ineffective with a high recidivism rate. With the knowledge that nicotine is the principal addictive compound of cigarettes, the authors have developed an antismoking vaccine based on the highly immunogenic properties of the hexon protein purified from the serotype 5 adenovirus (Ad) capsid. They hypothesized that an effective antinicotine vaccine could be based on coupling

the nicotine hapten AM1 to purified Ad hexon protein. To assess this, AM1 was conjugated to hexon purified from serotype 5 Ad to produce the HexonAM1 vaccine. C57Bl/6 mice were sensitized by 10 daily nicotine administrations (0.5 mg/kg, subcutaneous) to render the mice addicted to nicotine. Control groups were sensitized to phosphate-buffered saline (PBS). The mice were then immunized with HexonAM1 (4 μg, intramuscular) at 0, 3, and 6 weeks. By 6 weeks, the HexonAM1-vaccinated mice had serum antinicotine antibody titers of 1.1×10(6)±7.6×10(4). To demonstrate that these high antinicotine titers were sufficient to suppress the effects of nicotine, HexonAM1-vaccinated mice were evaluated for nicotine-induced hypoactive behavior with nicotine challenges (0.5 mg/kg wt) over 5 weeks. In all challenges, the HexonAM1-vaccinated mice behaved similar to PBS-challenged naive mice. These data demonstrate that a vaccine comprised of a nicotine analog coupled to Ad hexon can evoke a high level of antinicotine antibodies sufficient to inhibit nicotine-induced behavior. The HexonAM1 vaccine represents a platform paradigm for vaccines against small molecules.

Conditioned Contribution Of Peripheral Cocaine Actions To Cocaine Reward and Cocaine-Seeking. Wang B, You ZB, Oleson EB, Cheer JF, Myal S, Wise RA. Neuropsychopharmacology. 2013 Aug; 38(9): 1763-1769. doi: 10.1038/npp.2013.75. Epub 2013 Mar 27.

Cocaine has actions in the peripheral nervous system that reliably precede—and thus predict—its soon-to-follow central rewarding effects. In cocaine-experienced animals, the peripheral cocaine signal is relayed to the central nervous system, triggering excitatory input to the ventral tegmental origin of the mesocorticolimbic dopamine system, the system that mediates the rewarding effects of the drug. The authors used cocaine methiodide, a cocaine analog that does not cross the blood–brain barrier, to isolate the peripheral actions of cocaine and determine their central and behavioral effects in animals first trained to lever-press for cocaine hydrochloride (the centrally acting and abused form of the drug). They first confirmed with fast-scan cyclic voltammetry that cocaine methiodide causes rapid dopamine release from dopamine terminals in cocaine hydrochloride-trained rats. They then compared the ability of cocaine hydrochloride and cocaine methiodide to establish conditioned place preferences in rats with self-administration experience. While cocaine hydrochloride established stronger place preferences, cocaine methiodide was also effective and its effectiveness increased (incubated) over weeks of cocaine abstinence. Cocaine self-administration was extinguished when cocaine methiodide or saline was substituted for cocaine hydrochloride in the intravenous self-administration paradigm, but cocaine hydrochloride and cocaine methiodide each reinstated non-rewarded lever-pressing after extinction. Rats extinguished by cocaine methiodide substitution showed weaker cocaine-induced reinstatement than rats extinguished by saline substitution. These findings suggest that the conditioned peripheral effects of cocaine can contribute significantly to cocaine-induced (but not stress-induced) cocaine craving, and also suggest the cocaine cue as an important target for cue-exposure therapies for cocaine addiction.

NIH/HHS POLICY UPDATES

For a complete list see http://grants.nih.gov/grants/policy/policy.htm

2013

August 2	Implementation of the Revised International Guiding Principles for Biomedical Research Involving Animals
August 2	Extension of eRA Commons User IDs to Individuals in Graduate and Undergraduate Student Project Roles with Measurable Effort on an NIH Annual Progress Report (PHS2590 & RPPR)
July 26	Now Available: PHS 398 Application Forms and Instructions for Application Due Dates on or after September 25, 2013 and Updated Application Guides for Electronic Application Forms
July 26	Modifications to NIHs Planned and Cumulative Inclusion Enrollment Forms
July 23	NIH Encourages Institutions to Develop Individual Development Plans for Graduate Students and Postdoctoral Researchers
July 13	Notice of Change to Page Limits and Application Due Date in RFA-OD-13-008 Limited Competition: Restoring Research Resources Lost Due to Hurricane Sandy (R24)
July 3	NIH Anticipates Transition to Payment Management System Subaccounts in FY2014
May 30	NIH Announces an Adjustment to Transition Timeline for Electronic Submission of Multi-Project Applications
May 30	NIH to Require Use of Updated Electronic Application Forms for Due Dates on or after September 25, 2013
May 30	HHS Reissues PHS 2013-02 SBIR and STTR Omnibus Grant Solicitations Implementing Venture Capital Provision and SBA Company Registry Requirement of the SBIR/STTR Reauthorization Act of 2011
May 24	Reminder of Lobbying Prohibition on Federal Funds for All NIH-Supported Institutions
May 20	Outstanding Mentors are Eligible for Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM)
May 16	Change in the Application Due Date for RFA-OD-13-199 "NIH Administrative Supplements to Recover Losses Due to Hurricane Sandy Under the Disaster Relief Appropriations Act - Non-Construction (Admin Supp)
May 8	NIH Fiscal Policy for Grant Awards – FY 2013

CONGRESSIONAL AFFAIRS

(Prepared August 20, 2013)

Appropriations

Earlier this year, the President released his FY 2014 Budget. For NIH, the FY 2014 request is $31.3 billion, an increase of $471 million, or 1.5 percent, over the enacted FY 2012 level. For NIDA, the FY 2014 request is $1.072 billion, an increase of $20.2 million, or approximately 2 percent over the enacted FY 2012 level. The sequester is not taken into account for purposes of this budget.

On July 11, 2013, the Senate Appropriations Committee reported out S. 1284, the FY2014 Labor, HHS, Education Appropriations bill making appropriations for the Departments of Labor, Health and Human Services, and Education, and related agencies for the fiscal year ending September 30, 2014. The bill includes $30,954,976,000 for NIH, and $1.064 billion for NIDA.

Congressional Meetings/Briefings

Friends of NIDA Congressional Briefing

On July 10, the Friends of the National Institute on Drug Abuse coalition hosted a congressional briefing titled "Preventing Prescription Drug Abuse: Applying Science to Solve a Community Epidemic," organized by the American Psychological Association. This briefing was the 19th in the Friends of NIDA coalition's Charles R. Schuster Educational Briefing Series on Capitol Hill, designed to educate policy makers about current initiatives and advancements in science funded by NIDA. Speakers included NIDA Director Nora Volkow; Dr. Lisa Marsch, Director of the Center for Technology and Behavioral Health at the Geisel School of Medicine at Dartmouth; and Amy Haskins, public health educator and sanitarian for the Jackson County Health Department in West Virginia, and project director for the Jackson County Anti-Drug Coalition. The information in this briefing was presented in the context of a personal story from Phil Bauer, a national advocate for prescription drug safety. Cosponsored by the Congressional Addiction, Treatment and Recovery Caucus, the Congressional Caucus on Prescription Drug Abuse, and 23 member organizations of the Friends of NIDA, the briefing was attended by over 110 congressional staff, federal agency staff and members of the science advocacy community.

Some Bills of Interest

HR 486 – On February 4, 2013, Representative William Keating (D-MA) introduced the Stop Tampering of Prescription Pills act of 2013, to amend the Food, Drug and Cosmetic Act to incentivize the development of abuse-deterrent drugs. The bill was referred to the Committee on Energy and Commerce.

HR 498 – On February 5, 2013, Representative Lucille Roybal-Allard (D-CA) introduced a bill to reauthorize the Sober Truth on Preventing Underage Drinking (STOP) Act. Representatives Rosa DeLauro (D-CT), and Frank Wolf (R-VA) were the only two original co-sponsors of the legislation. The bill was referred to the House Committee on Energy and Commerce.

HR 499 – On February 5, 2013, Representative Jared Polis (D-CO) introduced the Ending Federal Marijuana Prohibition Act of 2013, to generally decriminalize and change the way the Controlled Substances Act is applied to marijuana. The bill was referred to the Committee on the Judiciary, the Committee on Ways and Means, the Committee on Energy and Commerce, the Committee on Natural Resources, and the Committee on Agriculture.

HR 672 -- On February 13, 2013, Representative Nick Rahall (D-WV) introduced the Prescription Drug Abuse Prevention and Treatment Act of 2013, to provide for increased federal oversight of prescription opioid treatment and assistance to states in reducing opioid abuse, diversion, and deaths. The bill was referred to the Committee on Energy and Commerce and the Committee on the Judiciary. See also S 348.

HR 1263 – On March 19, 2013, Representative Doris Matsui (D-CA) introduced the Excellence in Mental Health Act, to increase access to community behavioral health services for all Americans and to improve Medicaid reimbursement for community behavioral health services. The bill was referred to the Committee on Energy and Commerce. See also S 264, S 265.

HR 1285 – On March 20, 2013, Representative Vern Buchanan (R-FL) introduced Safe Prescribing Act of 2013, to amend the Controlled Substances Act to make any substance containing hydrocodone a schedule II drug. The bill was referred to the Committee on the Judiciary. See also S 621.

HR 1366 – On March 21, 2013, Representative Stephen Lynch (D-MA) introduced the Stop Oxycontin Abuse Act of 2013, to direct the Commissioner of Food and Drugs to modify the approval of any drug containing controlled-release oxycodone hydrochloride to limit such approval to use for the relief of severe-only instead of moderate-to-severe pain, and for other purposes. The bill was referred to the Committee on Energy and Commerce.

HR 1523 – On April 12, 2013, Representative Dana Rohrbacher (R-CA) introduced the Respect State Marijuana Laws Act of 2013, to amend the Controlled Substances Act to provide for a new rule regarding the application of the Act to marijuana, and for other purposes. The bill was referred to the Committee on the Judiciary and the Committee on Energy and Commerce.

S 237 – On February 7, 2013, Senator Lisa Murkowski (R-AK) introduced the Advancing FASD Research, Prevention and Services Act, to amend the Public Health Service Act to reauthorize and extend the FAS prevention and services program, and for other purposes. The bill was referred to the Committee on Health, Education, Labor and Pensions.

S 264 – On February 7, 2013, Senator Debbie Stabenow (D-MI) introduced the Excellence in Mental Health Act, to expand access to community mental health centers and improve the quality of mental health care for all Americans. The bill was referred to the Committee on Health, Education, Labor, and Pensions. See also S 265, HR 1263

S 265 – On February 7, 2013 Senator Jack Reed (D-RI) introduced Community-Based Mental Health Infrastructure Improvements Act, to amend the Public Health Service Act to provide grants for community-based mental health infrastructure improvement. The bill was referred to the Committee on Health, Education, Labor and Pensions. See also S 264, HR 1263

S. 348 – On February 14, 2013, Senator John Rockefeller (D-WV) introduced the Prescription Drug Abuse Prevention and Treatment Act of 2013, to provide for increased federal oversight of prescription opioid treatment and assistance to states in reducing opioid abuse, diversion, and deaths. The bill was referred to the Committee on Health, Education, Labor and Pensions. See also HR 672.

S. 621 – On March 20, 2013, Senator Joe Manchin (D-WV) introduced the Safe Prescribing Act of 2013, to amend the Controlled Substances Act to make any substance containing hydrocodone a schedule II drug. The bill was referred to the Committee on the Judiciary. See also HR 1285.

S. 644 – On March 21, 2013, Senator Robert Casey (D-PA) introduced the Preventing Abuse of Cough Treatments Act of 2013, to amend the Food, Drug, and Cosmetic Act to prevent the abuse of dextromethorphan, and for other purposes. The bill was referred to the Committee on Health, Education, Labor, and Pensions.

S. 1277 – On July 10, 2013, Senator Barbara Boxer (D-CA) introduced the Combating Prescription Drug Abuse Act, to establish a commission for the purpose of coordinating efforts to reduce prescription drug abuse, and for other purposes. The bill was referred to the Committee on Health, Education, Labor and Pensions.

PROGRAM ACTIVITIES/FOAS

New NIDA RFAs

On May 3, 2013, NIDA issued an RFA entitled **Substance Use Disorders and Molecular Regulation of Brain Energy Utilization RFA-DA-14-006 (R21), RFA-DA-14-005 (R01).** This RFA will support projects investigating the interplay between molecular regulation of brain energy utilization and brain and/or behavioral changes resulting from chronic exposure to abused substances. Open date: July 15, 2013. Application due date(s): August 15, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): August 15, 2013, by 5:00 PM local time of applicant organization.

On May 30, 2013, NIDA issued an RFA entitled **FY14 NIDA Avant-Garde Award Program for HIV/AIDS Research (DP1) RFA-DA-14-008**. The purpose of this RFA is to support individual scientists of exceptional creativity who propose high-impact research that will open new areas of HIV/AIDS research and/or lead to new avenues for prevention and treatment of HIV/AIDS among drug abusers. Open date: October 6, 2013. Application due date(s): November 6, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): November 6, 2013, by 5:00 PM local time of applicant organization.

On May 31, 2013, NIDA issued an RFA entitled **Seek, Test, Treat, and Retain Data Harmonization Coordinating Center (U01) RFA-DA-14-007**. This RFA solicits applications for a single interdisciplinary Coordinating Center to support data harmonization and analysis activities for a subset of NIDA-funded HIV services research grants. Open date: July 16, 2013. Application due date(s): August 16, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): August 16, 2013, by 5:00 PM local time of applicant organization.

On June 10, 2013, NIDA issued an RFA entitled **Comorbid HIV, Chronic Pain, and Substance Use among Older Adults (R21) RFA-DA-14-012**. This RFA invites innovative, exploratory research applications proposing to study the intersection of HIV, chronic pain, and substance use among older adults. Open date: October 15, 2013. Application due date(s): November 15, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): November 15, 2013.

On June 10, 2013, NIDA issued an RFA entitled **Integrating Substance Abuse Prevention and Treatment within HIV/AIDS Service Delivery Settings (R01) RFA-DA-14-011**. This RFA encourages hypothesis-driven research project applications to test implementation strategies for integrating evidence-based substance abuse services with HIV care in prevention-oriented settings (including sexually-transmitted infection [STI] clinics) where screening for drug and alcohol problems can be integrated with screening for HIV and other conditions. Open date: October 15, 2013. Application due date(s): November 15, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): November 15, 2013.

On June 10, 2013, NIDA issued an RFA entitled **HIV/AIDS and Substance Use among Black/African American Women and Young MSM (R01) RFA-DA-14-010**. This RFA seeks R01 research grant applications 1) to conduct research that expands our understanding of the intersection between substance use and HIV among Black/African American women (BAAW) and young Black/African American men who have sex with men (YBAAMSM), and 2) to develop and test interventions that improve HIV prevention and care among BAAW and YBAAMSM, with attention to substance use and its consequences. Open date: October 15, 2013. Application due date(s): November 15, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): November 15, 2013, by 5:00 PM local time of applicant organization.

On June 10, 2013, NIDA issued an RFA entitled **HIV/AIDS and Substance Use Among the Homeless and Unstably Housed (R01) RFA-DA-14-009**. The RFA encourages studies on the development, implementation, evaluation, and dissemination of effective HIV-prevention interventions, research related to the epidemiology of HIV infection and substance use, and health services studies to improve the quality of substance use prevention and treatment services for the homeless and unstably housed populations. Open date: October 15, 2013. Application due date(s): November 15, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): November 15, 2013, by 5:00 PM local time of applicant organization.

On July 16, 2013, NIDA issued an RFA entitled **Abuse-Resistant and Abuse-Deterrent Formulations and Devices to Avoid the Abuse, Misuse and Diversion of Prescription Opioids by Patients (SBIR)(R43/R44) RFA-DA-14-013**. This RFA represents a focused effort of NIDA on preventing diversion and misuse of prescription opioids at the patient level. Among potentially important steps towards the goal of safer opioid analgesics are the efforts to reformulate medication so that an individual would not be able (abuse resistance) or would not want (abuse deterrence) to divert the prescription drug, and to create innovative medication dispensing devices/gadgets. Open date: September 11, 2013. Application due date(s) October 11, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): October 11, 2013.

New NIDA Program Announcements

On May 6, 2013, NIDA issued a PAR entitled **NIDA Research "Center of Excellence" Grant Program (P50) PAR-13-222**. This PAR provides support for research Centers that (1) conduct drug abuse and addiction research in any area of NIDA's mission, (2) have outstanding innovative science, (3) are multidisciplinary, thematically integrated, synergistic, and (4) serve as national resource(s) to provide educational and outreach activities to drug abuse research communities, educational organizations, the general public, and policy makers in the NIDA research fields. Open date: August 24, 2013. Application due date(s): September 25, 2013, September 25, 2014, September 25, 2015, by 5:00 PM local time of applicant organization. AIDS application due date(s): January 7, 2014, January 7, 2015, January 7, 2016, by 5:00 PM local time of applicant organization.

On July 3, 2013, NIDA issued a PAR entitled **NIDA Program Project Grant Applications (P01) PAR-13-259**. This PAR supports collaborative research by multi-disciplinary teams which is of high priority to NIDA and leads to synergistic outcomes based on the synthesis of multiple research approaches. Open date: August 25, 2013. Application due date(s): Standard dates, by 5:00 PM local time of applicant organization. AIDS Application due date(s): Standard dates, by 5:00 PM local time of applicant organization.

On July 11, 2013, NIDA issued a PAR entitled **Grand Opportunity in Medications Development for Substance Use Disorders (U01) PAR-13-270.** The purpose of this PAR is to accelerate the development of medication for the treatment of Substance Use Disorders (SUDs) by encouraging research applications to support a diverse array of preclinical and/or clinical research projects. Open date: February 27, 2014. Application due date(s): March 27, 2014, July 28, 2014, March 27, 2015, July 28, 2015, March 28, 2016, July 28, 2016, by 5:00 PM local time of applicant organization. AIDS application due date(s): 05/07/2014, 09/07/2014, 05/07/2015, 09/07/2015, 05/07/2016, 09/07/2016, by 5:00 PM local time of applicant organization.

On August 19, 2013, NIDA issued a PAR entitled **Strategic Alliances for Medications Development to Treat Substance Use Disorders (R01) PAR-13-334.** The purpose of this PAR is to support research that advances compounds towards FDA approval by leveraging NIDA funds with the strengths and resources of outside organizations, such as for-profit and not-for-profit entities, including academic institutions, pharmaceutical and biotechnology companies, private and public foundations, and small businesses. Open date: February 27, 2014. Application due date(s): March 27, 2014, July 28, 2014, March 27, 2015, July 28, 2015, March 28, 2016, July 28, 2016, by 5:00 PM local time of applicant organization. AIDS application due date(s): May 7, 2014, September 7, 2014, May 7, 2015, September 7, 2015, May 7, 2016, September 7, 2016, by 5:00 PM local time of applicant organization.

New FOAs Issued By the Collaborative Research On Addiction at NIH (CRAN)[1]

On July 15, 2013, NIDA in collaboration with numerous other NIH components issued an RFA entitled **Revision Applications to Promote Collaborative Research on Addiction at NIH (CRAN): Comorbidity-Related Research (R01) RFA-DA-14-014**. The purpose of this RFA is to notify Program Directors/Principal Investigators (PDs/PIs) that funds are available for revisions to augment existing R01 research projects in order to help meet the goals of Collaborative Research on Addiction at NIH (CRAN); namely, the support of research in cross-cutting areas of substance use, abuse, addiction and related health consequences. Open date: August 24, 2013. Application due date(s):

[1] CRAN is a collaborative framework to enhance and expand activities related to substance use, abuse, and addiction research at the NIH.

September 24, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): September 24, 2013, by 5:00 PM local time of applicant organization.

On July 15, 2013, NIDA in collaboration with numerous other NIH components issued a PA entitled **Administrative Supplements to Promote Collaborative Research on Addiction at NIH (CRAN): Comorbidity-Related Research (Admin Supp)** **PA-13-275**. The purpose of this PA is to notify Program Directors (PDs)/Principal Investigators (PIs) that funds are available for administrative supplements to parent awards (see the Activity Code(s) listed above) in order to help meet the goals of Collaborative Research on Addiction at NIH (CRAN); namely, the support of research in cross-cutting areas of substance use, abuse, addiction and related health consequences. Open date: August 24, 2013. Application due date(s): September 24, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): Not applicable.

New FOAs Issued by the NIH Roadmap

On July 26, 2013, the NIH Common Fund issued a Roadmap RFA entitled **NIH Transformative Research Awards (R01)** **RFA-RM-13-008**. This RFA complements NIH's traditional, investigator-initiated grant programs by supporting individual scientists or groups of scientists proposing groundbreaking, exceptionally innovative, original and/or unconventional research with the potential to create new scientific paradigms, establish entirely new and improved clinical approaches, or develop transformative technologies. Open date: September 4, 2013. Application due date(s): October 4, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): Not applicable.

On August 7, 2013, the NIH Common Fund issued a Roadmap RFA entitled **DNA Sequencing Core for an Undiagnosed Diseases Network (UDN) (U01)** **RFA-RM-13-018.** The purpose of this RFA is to establish a centralized DNA Sequencing Core for Undiagnosed Diseases Network (UDN) patients. Open date: October 19, 2013. Letter of intent due date(s): October 19, 2013. Application due date(s): November 19, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): Not applicable.

On August 7, 2013, the NIH Common Fund issued a Roadmap RFA entitled **NIH Health Care Systems Research Collaboratory - Demonstration Projects for Pragmatic Clinical Trials Focusing on Multiple Chronic Conditions (UH2/UH3)** **RFA-RM-13-012.** The purpose of this RFA is to solicit applications for cooperative agreements for Demonstration Projects for efficient, large-scale pragmatic clinical trials focused on management of patients with multiple chronic conditions. Open date: November 2, 2013. Letter of intent due date(s): November 2, 2013. Application due date(s): December 2, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): December 2, 2013, by 5:00 PM local time of applicant organization.

On August 8, 2013, the NIH Common Fund issued a Roadmap RFA entitled **NIH Director's New Innovator Award Program (DP2)** **RFA-RM-13-007.** This RFA supports a small number of early stage investigators of exceptional creativity who propose bold and highly innovative new research approaches that have the potential to produce a major impact on broad, important problems in biomedical and behavioral research. Open date(s): September 25, 2013, September 17, 2014, and September 16, 2015. Letter of intent due date(s): Not applicable. Application due date(s): October 25, 2013, October, 17, 2014, and October 16, 2015, by 5:00 PM local time of applicant organization. AIDS application due date(s): Not applicable.

On August 8, 2013, the NIH Common Fund issued a Roadmap RFA entitled **NIH Pioneer Award Program (DP1)** **RFA-RM-13-006.** The NIH Pioneer Award initiative complements NIH's traditional, investigator-initiated grant programs by supporting individual scientists of exceptional creativity who propose pioneering and possibly transforming approaches to addressing major biomedical or behavioral challenges that have the potential to produce an unusually high impact on a broad area of biomedical or behavioral research. Open date(s): September 18, 2013, September 10, 2014, and September 9, 2015. Letter of intent due date(s): Not applicable. Application due date(s): October 18, 2013, October 10, 2014, and October 9, 2015, by 5:00 PM local time of applicant organization. AIDS application due date(s): Not applicable.

On August 14, 2013, the NIH Common Fund issued a Roadmap RFA entitled **NIH Director's Early Independence Awards (DP5)** **RFA-RM-13-009.** The NIH Director's Early Independence Award Program supports exceptional investigators who wish to pursue independent research directly after completion of their terminal doctoral/research degree or clinical residency, thereby forgoing the traditional post-doctoral training period and accelerating their entry

into an independent research career. Open date(s): December 31, 2013. Letter of intent due date(s): December 31, 2013. Application due date(s): January 31, 2014, by 5:00 PM local time of applicant organization. AIDS application due date(s): Not applicable.

On August 19, 2013, the NIH Common Fund issued a Roadmap RFA entitled **Library of Integrated Network-Based Cellular Signatures (LINCS): Perturbation-Induced Data and Signature Generation Centers (U54) RFA-RM-13-013.** This FOA seeks to fund large-scale data production efforts that will enhance the existing LINCS resource while addressing the following: use of a broader range of cell types and assays than used in the existing LINCS resource, improved multidimensional data integration, some new technology development, user-interfaces needed by the typical biomedical scientist, and dissemination of the LINCS approach to study a broad range of disease biology and mechanisms. The outcomes of the research solicited by this FOA are expected to be highly synergistic with those of other research programs. Letter of intent due date(s): November 19, 2013. Application due date(s): December 19, 2013. AIDS application due date(s): Not applicable.

New RFAs Issued by Other NIH/HHS Components in which NIDA is a participant

On May 3, 2013, NIDA, in collaboration with numerous other NIH components, issued an RFA entitled **Short Courses on Innovative Methodologies in the Behavioral and Social Sciences (R25) RFA-OD-13-009**. This RFA invites Research Education Grant (R25) applications to develop, implement, evaluate and disseminate short courses in innovative methods for behavioral and social sciences research (BSSR). Methodological domains include but are not limited to experimental design, data collection, measurement, and data analysis and visualization. Open date: (New Date **October 14, 2013** per **NOT-OD-13-073**), originally June 3, 2013. Letter of Intent due date(s): (New Date **October 14, 2013** per **NOT-OD-13-073**), originally June 3, 2013. Application due date(s): (New Date **November 14, 2013** per **NOT-OD-13-073**), originally July 3, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): (New Date **January 7, 2014** per **NOT-OD-13-073**), originally July 3, 2013, by 5:00 PM local time of applicant organization.

On May 6, 2013, NIDA, in collaboration with numerous other NIH components, issued an RFA entitled **Integration and Analysis of Diverse HIV-Associated Data (R03) RFA-MH-14-200.** This RFA aims to stimulate the integration of data across HIV research networks and cohorts as well as the development, adaptation and application of state-of-the-art analytic methods to achieve a better understanding of the various factors that characterize neurobehavioral and psychosocial functioning of people living with HIV or those at risk for HIV. Open date: July 19, 2013. Letter of Intent due date(s): July 19, 2013. Application due date(s): August 19, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): August 19, 2013, by 5:00 PM local time of applicant organization.

On May 17, 2013, NIDA, in collaboration with numerous other NIH components, issued an RFA entitled **Research on the Role of Epigenetics in Social, Behavioral, Environmental and Biological Relationships, throughout the Life-Span and across Generations (R21) RFA-TW-13-002**. This RFA encourages exploratory and developmental grant applications to lay the foundation for innovative and collaborative basic research on the role of epigenetics in social, behavioral, environmental and biological relationships, throughout the life-span and across generations. Open date: October 13, 2013. Letter of Intent due date(s): October 13, 2013. Application due date(s): November 13, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): November 13, 2013, by 5:00 PM local time of applicant organization.

On June 19, 2013, NIDA, in collaboration with numerous other NIH components, issued an RFA entitled **Person-Centered Outcomes Research Resource (U2C) RFA-CA-13-008.** The purpose of this RFA is to support the creation of a research resource infrastructure for the administration of research investigations using person-centered health outcomes, further referred to as the Person-Centered Outcomes Research Resource (PCORR). The overarching goal for the PCORR will be to facilitate person-centered outcome research by supporting the use and enhancements of the following four measurement information systems, currently funded as separate NIH programs: the Patient Reported Outcomes Measurement Information System® (PROMIS®: http://www.nihpromis.org/); the NIH Toolbox for Assessment of Neurological and Behavioral Function (NIH Toolbox: http://www.nihtoolbox.org/); the Quality of Life (QOL); Outcomes in Neurological Disorders (Neuro-QOL: http://www.neuroqol.org/); and the Adult Sickle Cell Quality of Life Measurement Information System (ASCQ-Me: http://www.air.org/files/4_pager_AIR_Health_Polict_2011_V10F.pdf). Open date: August 26, 2013. Letter of Intent

due date(s): August 26, 2013. Application due date(s): September 26, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): not applicable.

On July 1, 2013, NIDA, in collaboration with numerous other NIH components, issued an RFA entitled **Health Services and Observational Studies of Non-Pharmacological Approaches to Managing Pain and Co-Morbid Conditions in U.S. Military Personnel, Veterans, and their Families (R01) RFA-AT-14-005**. This RFA seeks applications proposing Health Services research or Observational studies focused on the use of non-pharmacological approaches to symptom management for pain and associated problems (e.g., post-traumatic stress disorder (PTSD), traumatic brain injury (TBI), substance use disorder (SUD), depression, anxiety, and sleep disturbances) among U.S. military personnel and Veterans. Open date: September 11, 2013. Letter of Intent due date(s): September 11, 2013. Application due date(s): October 11, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): not applicable.

On July 1, 2013, NIDA, in collaboration with numerous other NIH components, issued an RFA entitled **Studies of Non-Pharmacological Approaches to Managing Pain and Co-Morbid Conditions in U.S. Military Personnel, Veterans, and their Families RFA-AT-14-003 (Clinical Trials and Interventional Studies - R01), RFA-AT-14-004 (Pilot and Feasibility Studies - R34), RFA-AT-14-005 (Health Services and Observational Studies – R01).** These RFAs seek applications proposing clinical trials/interventional research, preliminary clinical studies or health services research/observational studies focused on non-pharmacological approaches to symptom management for pain and associated problems (e.g., post-traumatic stress disorder (PTSD), traumatic brain injury (TBI), substance use disorder (SUD), depression, anxiety, and sleep disturbances) among U.S. military personnel and Veterans. Open date: September 11, 2013. Letter of Intent due date(s): September 11, 2013. Application due date(s): October 11, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): not applicable.

On July 22, 2013, NIDA, in collaboration with numerous other NIH components, issued an RFA entitled **Centers of Excellence for Big Data Computing in the Biomedical Sciences (U54) RFA-HG-13-009**. This RFA supports Big Data to Knowledge (BD2K) Initiative Centers of Excellence to conduct research advancing the science and utility of Big Data in the context of biomedical and behavioral research, and to create innovative new approaches, methods, software, tools, and related resources. Open date: not applicable. Letter of Intent due date(s): October 20, 2013. Application due date(s): November 20, 2013. AIDS application due date(s): November 20, 2013.

New PAs Issued with Other NIH/HHS Components in which NIDA is a participant

On May 30, 2013, NIDA, in collaboration with numerous other NIH components, issued a PA entitled **Reissue PHS 2013-02 Omnibus Solicitation of the NIH for Small Business Technology Transfer Grant Applications (Parent STTR [R41/R42]) PA-13-235**. This PA reissued by the National Institutes of Health (NIH) invites eligible United States small business concerns (SBCs) to submit Small Business Technology Transfer (STTR) grant applications. Open date: July 5, 2013. Letter of Intent due date(s): not applicable. Application due date(s): Standard dates apply, by 5:00 PM local time of applicant organization. AIDS application due date(s): Standard AIDS dates apply, by 5:00 PM local time of applicant organization.

On May 30, 2013, NIDA, in collaboration with numerous other NIH components, issued a PA entitled **Reissue PHS 2013-02 Omnibus Solicitation of the NIH, CDC, FDA and ACF for Small Business Innovation Research Grant Applications (Parent SBIR [R43/R44]) PA-13-234**. This PA reissued by the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA) and the Administration for Children and Families (ACF) invites eligible United States small business concerns (SBCs) to submit Small Business Innovation Research (SBIR) grant applications. Open date: July 5, 2013. Letter of Intent due date(s): not applicable. Application due date(s): Standard dates apply, by 5:00 PM local time of applicant organization. AIDS application due date(s): Standard AIDS dates apply, by 5:00 PM local time of applicant organization.

On May 31, 2013, NIDA, in collaboration with numerous other NIH components, issued a PAR entitled **Native American Research Centers for Health (NARCH) (S06) PAR-13-239**. The purpose of this PAR is to encourage grant applications for new or continued Native American Research Centers for Health (NARCH). The NARCH program supports opportunities for conducting research and research training to meet the needs of American

Indian/Alaska Native (AI/AN) communities. Open date: not applicable. Letter of Intent due date(s): July 6, 2013. Application due date(s): August 6, 2013. AIDS application due date(s): not applicable.

On July 24, 2013, NIDA, in collaboration with numerous other NIH components, issued a PAR entitled **Development and Application of PET and SPECT Imaging Ligands as Biomarkers for Drug Discovery and for Pathophysiological Studies of CNS Disorders (R21) PAR-13-282**. This PAR invites research grant applications from organizations/institutions that propose the development of novel radioligands for positron emission tomography (PET) or single photon emission computed tomography (SPECT) imaging in human brain, and that incorporate pilot or clinical feasibility evaluation in pre-clinical studies, model development, or clinical studies. Open date: September 16, 2013. Letter of Intent due date(s): not applicable. Application due date(s): Standard dates apply, by 5:00 PM local time of applicant organization. AIDS application due date(s): not applicable.

On August 2, 2013, NIDA, in collaboration with numerous other NIH components, issued a PA entitled **NIH Small Research Grant Program (Parent R03) PA-13-304.** This PA supports small research projects that can be carried out in a short period of time with limited resources. The R03 activity code supports different types of projects including pilot and feasibility studies; secondary analysis of existing data; small, self-contained research projects; development of research methodology; and development of new research technology. Open date: August 7, 2013. Letter of Intent due date(s): not applicable. Application due date(s): Standard dates apply, by 5:00 PM local time of applicant organization. AIDS application due date(s): Standard AIDS dates apply, by 5:00 PM local time of applicant organization.

On August 2, 2013, NIDA, in collaboration with numerous other NIH components, issued a PA entitled **NIH Exploratory/Developmental Research Grant Program (Parent R21) PA-13-303.** The R21 activity code is intended to encourage exploratory and developmental research projects by providing support for the early and conceptual stages of these projects. These studies may involve considerable risk but may lead to a breakthrough in a particular area, or to the development of novel techniques, agents, methodologies, models, or applications that could have a major impact on a field of biomedical, behavioral, or clinical research. Open date: August 7, 2013. Letter of Intent due date(s): not applicable. Application due date(s): Standard dates apply, by 5:00 PM local time of applicant organization. AIDS application due date(s): Standard AIDS dates apply, by 5:00 PM local time of applicant organization.

On August 2, 2013, NIDA, in collaboration with numerous other NIH components, issued a PA entitled **Research Project Grant (Parent R01) PA-13-302**. The Research Project Grant (R01) supports a discrete, specified, circumscribed project to be performed by the named investigator(s) in areas representing the specific interests and competencies of the investigator(s). The proposed project must be related to the programmatic interests of one or more of the participating NIH Institutes and Centers (ICs) based on descriptions of their programs. Open date: August 7, 2013. Letter of Intent due date(s): not applicable. Application due date(s): Standard dates apply, by 5:00 PM local time of applicant organization. AIDS application due date(s): Standard AIDS dates apply, by 5:00 PM local time of applicant organization.

On August 2, 2013, NIDA, in collaboration with numerous other NIH components, issued a PA entitled **Behavioral and Social Science Research on Understanding and Reducing Health Disparities (R01) PA-13-292 (R21) PA-13-288.** This PA encourages behavioral and social science research on the causes and solutions to health and disabilities disparities in the U.S. population. Emphasis is placed on research in and among three broad areas of action: 1) public policy, 2) health care, and 3) disease/disability prevention. Particular attention is given to reducing "health gaps" among groups. Open date(s): September 5, 2013 (**PA-13-292**) September 16, 2013 (**PA-13-288**). Letter of Intent due date(s): not applicable. Application due date(s): Standard dates apply, by 5:00 PM local time of applicant organization. AIDS application due date(s): Standard AIDS dates apply, by 5:00 PM local time of applicant organization.

On August 8, 2013, NIDA, in collaboration with numerous other NIH components, issued a PAR entitled **Increased Knowledge and Innovative Strategies to Reduce HIV Incidence–iKnow Projects (R01) PAR-13-323.** The purpose of this PAR is to promote innovative research that addresses one or both of the following objectives: 1) Devise optimal strategies to improve the identification of persons unaware of their HIV-1 infection and successfully link them to HIV testing, treatment, and prevention interventions. 2) Develop and examine the feasibility and acceptability of novel integrated interventions of biomedical and behavioral strategies that substantially reduce the

likelihood of onward HIV transmission in these populations. Open date(s): December 7, 2013. Letter of Intent due date(s): not applicable. Application due date(s): January 7, 2014; January 7, 2015; January 7, 2016, by 5:00 PM local time of applicant organization. AIDS application due date(s): January 7, 2014; January 7, 2015; January 7, 2016, by 5:00 PM local time of applicant organization.

New NIH FOAs Issued in Collaboration with the FDA Center for Tobacco Products

On June 20, 2013, NIDA, in collaboration with numerous other NIH components, issued an RFA entitled **Tobacco Control Regulatory Research RFA-OD-13-012 (R03) RFA-OD-13-011 (R01) RFA-OD-13-010 (R21).** The purpose of this RFA is to encourage biomedical, behavioral, and social science research that will inform the development and evaluation of regulations on tobacco product manufacturing, distribution, and marketing. Open date: December 15, 2013. Letter of Intent due date(s): December 15, 2013; May 17, 2014; December 16, 2014. Application due date(s): January 15, 2014; June 17, 2014, January 16, 2015, by 5:00 PM local time of applicant organization. AIDS application due date(s): not applicable.

On June 28, 2013, NIDA, in collaboration with numerous other NIH components, issued an RFA entitled **Tobacco Control Regulatory Research RFA-OD-13-016 (K99/R00 Pathway to Independence Award), RFA-OD-13-014 (K01 Mentored Research Scientist Career Development Award), RFA-OD-13-015 (K22 Transition Career Development Award), RFA-OD-13-013 (K08 Mentored Clinical Scientist Research Career Development Award).** The purpose of these RFAs are to increase and maintain a strong cohort of new and talented independent investigators conducting research that will inform the development and evaluation of regulations on tobacco product manufacturing, distribution, and marketing. Open date: September 2, 2013. Letter of Intent due date(s): September 2, 2013. Application due date(s): October 2, 2013, by 5:00 PM local time of applicant organization. AIDS application due date(s): not applicable.

COLLABORATIVE RESEARCH ON ADDICTION AT NIH (CRAN) ACTIVITIES

NIDA and NIAAA co-sponsored the collaborative workshop **"Building the Next Generation of Integrative Approaches for Understanding Comorbid Alcohol, Drug Abuse, and Attention Disorders"** on May 13-14, 2013 in Rockville, MD. The meeting focused on understanding developmental pathways involved in risk for alcohol use and drug abuse disorders for comorbid sub-populations and the development of integrative models of risk and novel approaches that may be more generalizable to health care providers, researchers, and policy makers. Drs. Karen Sirocco, NIDA, Cheryl Anne Boyce, NIDA, and Mariela Shirley, NIAAA, served as the joint institute co-chairs of this meeting.

On March 13, 2013, NIDA, in conjunction with NIAAA, NICHD, NIMH and NINDS, held **"Views By Two: Addressing Health Disparities Through Neuroscience"** with speakers Drs. Guillermo Bernal (University of Puerto Rico) and Patricia Molina (Louisiana State University Health Sciences Center), who presented on the topic "Is Evidence-Based Medicine Generalizable to all Races and Ethnicities?" The goal of the series is to increase awareness of health disparities relating to neuroscience through a collegial discussion between 2 renowned scientists on a shared topic. Flair Lindsey, Program Analyst, Special Populations Office, represents NIDA on this inter-agency planning committee.

Ivan Montoya, Medical Officer of NIDA DPMC was re-appointed Chair of the Addictions IRB, which serves the Intramural Research Programs of NIDA and NIAAA.

COMMUNICATIONS

Publications and Online Resources

NIDA Notes (now online only)

Thirteen new articles have been posted on the NIDA Notes homepage. These articles included the first NIDA@Work video, featuring Redonna Chandler, PhD., Health Services Research Branch. The NIDA Notes Glossary was activated, allowing readers to click on hyperlinks to get definitions of technical terms used in the newsletter.

CTN-Related Resource

Data from 27 CTN studies are now available on the NIDA Data Sharing website http://datashare.nida.nih.gov/. Over 2,000 data sets have been downloaded by researchers from 45 countries. These data sets are in compliance with HIPAA and CDISC (Clinical Data Interchange Standards Consortium) standards in support of the interoperability required by the NIH Roadmap. The CTN Data Share is also part of the Neuroscience Information Framework (NIF), which is a dynamic inventory of Web-based neuroscience resources: data, materials, and tools accessible via any computer connected to the Internet.

International Program-Related Publications/Online Initiatives

NIDA International Program E-News

- *June 2013* – This issue highlighted the binational agreement between NIDA and Inserm, collaboration between the Mexican Instituto Nacional de Psiquiatria Ramón de la Fuente and the CTN Florida Node Alliance, and a new IP webinar that explores the role of research in drug policy. Other stories reported on the impact of NIDA- and Fogarty International Center-funded research in Bulgaria, and graduation ceremonies for NIDA Hubert H. Humphrey Drug Abuse Research Fellows at Virginia Commonwealth and Johns Hopkins universities.
- *April 2013* – The E-News described new funding opportunities and the participation of NIDA Director Nora D. Volkow, M.D., in a roundtable discussion by National Institutes of Health leaders during the Consortium of Universities for Global Health conference, held March 14–16, 2013, in Washington, DC. Other stories summarized drug abuse research efforts in Saudi Arabia that include NIDA grantees, presentations by NIDA fellows at the March 14 CTN Steering Committee Meeting, and the appointment of former INVEST/CTN fellow Amit Chakrabarti, M.D., to the National Institute of Occupational Health in India.

Webinar Explores Role of Research in Drug Policy

The latest NIDA International Program webinar, Understanding the Relationships Between Policy and Research, is now available for viewing. Alison Ritter, Ph.D., who directs the Drug Policy Modelling Program at the University of New South Wales, Australia, provides viewers with a broad overview of the drug policy process. Building on her extensive experience in Australian and international settings, Dr. Ritter focused on the interaction among multiple players—including politicians, the media, and drug abuse researchers—who define drug problems and identify and evaluate potential solutions.

Community and Press Events

NIDA Participates in ONDCP's Unveiling of 2013 National Drug Control Strategy

April 24, 2013. ONDCP Director Gil Kerlikowske, Dr. Nora Volkow, and Baltimore Police Commissioner Tony Batts, spoke at a press conference held at Johns Hopkins University School of Medicine regarding ONDCP's release of the 2013 National Drug Control Strategy, the Obama Administration's primary blueprint for drug policy in the United States.

Dr. Volkow Receives ASAM Award

April 25-28, 2013. Dr. Volkow attended the American Society of Addiction Medicine (ASAM) 44th Annual Medical-Scientific Conference in Chicago, Illinois, where she was presented with the John P. McGovern Award. This award was established in 1997 to recognize and honor an individual who has made highly meritorious contributions to public policy, treatment, research, or prevention which has increased our understanding of the relationship of addiction and society. Dr. Volkow also addressed the gathering with the Lecture on Addiction and Society.

Dr. Nora Volkow participated in the World Science Festival
May 2013. Dr. Volkow attended the World Science Festival *Pioneers in Science* program where she participated in two town-hall style sessions each with groups of 50 high school students - one in English and the other in Spanish. She was videotaped answering questions from high school students from the New York area, with selected schools around the world tuning in remotely via Google Hangouts. *Pioneers of Science* is an annual program that allows students to interact with world-renowned scientists. The event was moderated by *WABC News*, who also interviewed Dr. Volkow. The previous night, Dr. Volkow participated in *The Moth Mainstage* event in which she was one of five storytellers who told a personal story on the theme *What Lies Beneath: Stories of Discovery*.

Dr. Nora Volkow participated in Child Mind Institute Webinar
May 6, 2013. Dr. Nora Volkow participated in a Speak Up for Kids video webinar for the Child Mind Institute. She spoke about "*Raising Drug-Free Kids: How Can the Science of Addiction Help Us?*"

Dr. Nora Volkow selected as a Sammies finalist
June 2013. Dr. Volkow was named one of 31 finalists for the Samuel J. Heyman Service to America Medals, also known as the Sammies, which recognizes outstanding service and are considered among the most prestigious available to federal workers. Dr. Volkow was recognized as a finalist for the "Science and Environment" medal.

Press Releases

May 17, 2013 - Study of "screen time" on mood, memory, and cognition wins top NIH Addiction Science Award.

Meetings/Conferences

Select Meetings and Conferences in which NIDA played a significant role

On April 25-26, 2013, NIDA's Special Populations Office hosted a two-day **Special Populations Research Development Seminar Series workshop** in Bethesda, Maryland. Chaired by Flair Lindsey, Program Analyst, this workshop convened 10 new substance abuse investigators and NIDA-supported faculty mentors in an intensive grants development workshop setting, and culminated in a mock review of research grant applications submitted by the new investigator participants.

On April 25-28, 2013, NIDA organized and presented several symposia on important topics at this year's **ASAM Annual Conference** annual conference in Chicago. (1) Dr. Jag Khalsa of DPMC, Dr. Geetha Subramanian of CCTN, and Dr. Gavin Bart of ASAM presented the symposium "**Buprenorphine: New Formulations, Medication Combinations, Indications and Longitudinal Effects**"; (2) Dr. Khalsa and Dr. Marc Galanter of ASAM, in collaboration with ISAM, organized/presented the symposium "**International Perspectives on Addiction Medicine**"; (3) Dr. Khalsa and Dr. Jeffrey Samet of ASAM presented on "**Addressing Care for Hepatitis C Virus Infection I the Addicted Patient: The Dawn of a New Era in Screening and Treatment**"; and (4) Dr. Khalsa, Dr. Guifang Lao and Dr. Shwe Gyaw of DPMC presented on "Substance Abuse and Post-Traumatic Stress Disorder (PTSD): Chicken first or an Egg?"

On May 18-22, 2013, NIDA presented a special research track at the **American Psychiatric Association (APA) Annual Meeting in San Francisco, California.** NIDA participated in a number of sessions on topics unique to addiction science. NIDA Director Nora Volkow gave a Frontiers of Science Lecture on new scientific findings and therapeutic opportunities to address substance use disorders. There were sessions on the clinical implications of changes in the revised DSM-5; comorbid psychiatric and substance use disorders (SUDs) and the implications for early

identification and treatment; and advances in pharmacotherapies for SUDs. Symposia and lectures provided an update to participants on areas critical to psychiatric practice, including a session on risk assessment and treatment of cannabis use in youth and another on prescription opioid abuse and treatment options. A special forum of NIDA's *Addiction Performance Project* was also featured at this year's meeting.

On June 11-12, 2013, Drs. Jessica Chambers and Lisa Onken, DCNBR, held a NIDA-sponsored meeting on **Future Directions for Developing Behavioral Treatments for Adolescent Drug Abuse,** in Rockville, MD**.** The primary focus of this meeting was on improving the community-friendliness of existing evidence based treatments and the next generation of adolescent drug abuse treatments.

On June 15-20, 2013, at the **Annual Meeting of the College on Problems of Drug Dependence (CPDD)** in San Diego, CA, NIDA held a **Grant-Writing and Career Workshop** and the **NIDA/CPDD Training Networking Event**. The Grant-Writing and Career Workshop provided information on NIDA research priorities, program interests and funding opportunities, review procedures, and training on grantsmanship and other career-building skills. Presenters included Drs. David Shurtleff and Kevin Walton, Linda Cottler (University of Florida), Steffanie Strathdee (University of California, San Diego) and Thomas Patterson (University of California, San Diego). The Training Networking Event provided a forum for training directors and trainees to learn about NIDA's training programs and for trainees to network with NIDA staff and find future training and employment opportunities. In addition, NIDA's Women & Sex/Gender Differences Research Program awarded 28 **Women & Gender Junior Investigator Travel Awards** to promote entry of junior investigators into drug abuse research on women and sex/gender differences. NIDA also awarded 20 **Director's Travel Awards** for the National Research Service Award (NRSA) trainees and fellows, and Diversity Supplement recipients to present at the CPDD meeting and attend the NIDA Grant-Writing and Career Workshop.

On June 27, 2013, Dr. Yu (Woody) Lin organized a symposium entitled "**fMRI-based Biomarkers for Clinical Pain and Analgesia,"** held at NIDA. It was co-sponsored by DCNBR, the NIDA Prescription Opioid and Pain Workgroup, and the NIH Pain Consortium.

On July 11-12, 2013, Dr. Vishnu Purohit and Dr. Rao Rapaka organized a NIDA symposium on the **Role of Cannabinoids in Drug Addiction** in Rockville, MD.

On July 26, 2013, Drs. Rao Rapaka, Vishnu Purohit and Hari Singh organized a conference entitled **"Emerging trends in the Abuse of Designer Drugs and Their Catastrophic Health Effects: Update on Chemistry, Toxicology, Addiction Potential and Treatment"** in Rockville, MD.

On July 29, 2013, Drs. Rao Rapaka and Vishnu Purohit organized a conference entitled **"TRPs as Probes and Medications for CNS Disorders: Focus on the Trptome, Trptomics, Addiction and Pain"** in Rockville, MD.

On July 31 – August 4, 2013, NIDA organized a program at the **2013 American Psychological Association (APA) Annual Meeting** in Honolulu, HI**.** A number of NIDA staff were involved in the planning of sessions on a wide range of topics related to addiction research. NIDA also co-sponsored an Early Career Investigator Poster Session with APA's Divisions 28 and 50 and the National Institute on Alcohol Abuse and Alcoholism (NIAAA) as part of the two Divisions' Social Hour.

Upcoming Conferences/Exhibits

Society for Neuroscience (SfN) Annual Meeting – San Diego, CA - November 9-13, 2013.

- November 8, 2013 - NIDA is planning to hold **Frontiers in Addiction Research Mini-convention** at the Westin Hotel in the Gas Lamp Quarter in San Diego (pending official approvals) as a Satellite Session of the SfN. The proposed sessions include: Emerging and Novel Aspects of Neuronal Transmission; the Jacob P. Waletzky Memorial Lecture; Extracellular RNAs in Neuroscience: Biology, Biomarkers, and Therapeutics; Advances in High Resolution and Large Scale Imaging of Brain Networks and Circuits; and the Role of the Basal Ganglia in Addiction.
- November 9-13, 2013 - NIDA will be participating in the **NIH Neuroscience exhibit booth**.
- November 11, 2013 - NIDA will be holding the workshop **Transitioning Beyond the Postdoc: Workshop for Early Career Investigators.**

- November 12, 2013 – NIDA will be hosting the mini-symposium **New Insights into the Specificity and Plasticity of Reward and Aversion Encoding in the Mesolimbic System**.

American Academy of Child and Adolescent Psychiatry (AACAP) Annual Meeting - Orlando, Florida - October 22-27, 2013.
NIDA involvement at AACAP provides staff the opportunity to share and discuss cutting-edge addiction science information with child and adolescent psychiatrists, medical students and residents from around the country and across disciplines. These collaborations further our public health goals of broadly disseminating research results to improve substance use prevention and treatment in adolescents. NIDA is participating in several sessions at this year's meeting, including topics on understanding ADHD and smoking; medication therapies for youth with alcohol and other substance use disorders as well as a grant writing workshop.

GRANTEE HONORS AND AWARDS

Dr. Karen Bierman, Professor, The Pennsylvania State University, received the 2013 Prevention Science Award from the Society for Prevention Research, in recognition of her work developing and testing prevention strategies.

Dr. Eric Brown, Research Assistant Professor, University of Washington, received the 2013 International Collaborative Prevention Research Award, for his contributions to the field of prevention science in the area of international collaboration.

Dr. Ben Cravatt was the recipient of the International Cannabinoid Research Society (ICRS) Mechoulam Award for 2012 and was presented with the honor at the 2013 Symposium as he was not able to attend the meeting in 2012.

Dr. Mahmoud ElSohly received the Lifetime Achievement Award, 2013 from the International Cannabinoid Research Society.

Dr. Brian Flay, Professor, Oregon State University, received the 2013 Friend of ECPN (Early Career Preventionist Network) award from the Society for Prevention Research, in recognition of his support and encouragement of early career prevention scientists or issues.

Dr. Mark Greenberg, Professor, The Pennsylvania State University, received the 2013 Presidential Award of the Society for Prevention Research, in recognition of his lifetime contribution to prevention science research.

On June 6-8, 2-13, **Dr. Brian M. Hicks**, Research Assistant Professor of Psychiatry at the University of Michigan, was recognized with the Early Career Contributions Award at the 5th biennial meeting of the Society for the Scientific Study of Psychopathy that met in Washington, DC.

Dr. Aron Lichtmann was the recipient of Mechuolam Award for the ICRS 2013.

Dr. Louise Rohrbach, Associate Professor, University of Southern California and **Dr. Richard Spoth**, Senior Prevention Scientist, Iowa State University, were named the 2013 co-recipients of the Service to SPR Award, in recognition of their outstanding service to the organization, which involved co-chairing the Mapping Advances in Prevention Science (MAPS) Type 2 Translational Research Task Force.

Dr. Helene White, Professor, Rutgers University, received the 2013 Translational Science Award from the Society for Prevention Research, in recognition of her contributions to the field of prevention science in the area of Type 1 or Type 2 translational research.

The entire inaugural cohort of **Fellows of the Society for Prevention Research** included current or past NIDA grantees. Fellows were accepted in recognition of their distinguished record of research reflecting a body of work that has had a broad and significant impact on prevention science. Nine Fellows were accepted into the 2013 inaugural cohort: **Dr. Gilbert Botvin**, Professor Emeritus, Weill Cornell Medical College; **Dr. Patricia Chamberlain**, Senior Research Scientist, Oregon Social Learning Center; **Dr. J. David Hawkins**, Professor, University of Washington; **Dr. Sheppard Kellam**, Professor Emeritus, Johns Hopkins University; **Dr. David MacKinnon**, Professor, Arizona State University; **Dr. David Olds**, Professor, University of Colorado, Denver; **Dr. Irwin Sandler**, Professor, Arizona State University; **Dr. Zili Sloboda**, Consultant, JBS International, Inc.; **Dr. Patrick Tolan**, Professor, University of Virginia.

Dr. Patricia Penn, a long-time member of the CTN Western States Node (and of the original California-Arizona Node) was the recipient of a Let's Get Better Together Lifetime Achievement Award from the LGBTQ Behavioral Health Coalition of Southern Arizona and the LGBTQ Consortium.

Dr. Antoine Douaihy of the CTN Appalachian Tri-State Node was chosen by the current students of the University of Pittsburgh School of Medicine to receive the Charles Watson Teaching Award. This award was presented at the AOA Induction Banquet on April 23, 2013.

Researchers from the CTN Florida Node Alliance (FNA) led by Executive Director, **Dr. Viviana Horigian**, were recognized by the National Institute of Psychiatry in Mexico for successfully completing the first phase of a groundbreaking collaboration involving the transfer of technology for clinical trials implementation.

STAFF CHANGES

New Employees

Lisa Coleman joins the NIDA COAC as the Deputy Director, OA, NIDA from NCI. Ms. Coleman has been a highly regarded Contracting Officer at NIAID, NICHD, and NCI. Ms. Coleman will assist the Director, OA, NIDA in overseeing COAC Acquisition Policy, Operations & Oversight.

Sean Dalenberg joined NIDA's Office of Acquisitions (OA) as a contract specialist in the NCATS Section of OA in July 2013. Sean comes to us from the DHHS Program Services Center (PSC) with several years of contracting experience as both a Contracting Officer and a Contracting Officer's Representative (COR).

Paula Peltier joined the Administrative Management Branch (AMB) in July 2013 as an Administrative Specialist. Paula is the new NIDA HQ point of contact for purchasing, payments, and policy guidance. She comes to us with over 20 years of experience in the administrative/procurement field, most recently with the NCI OD.

New Appointments/Transfers

Dr. Dave Thomas of the Division of Basic Neuroscience and Behavioral Research (DBNBR) is joining the Division of Clinical Neuroscience and Behavioral Research (DCNBR) as the Deputy Director. Dr. Thomas began his career at the National Institutes of Health (NIH) in 1984, working in the intramural pain research program at the then National Institute on Dental Research (now NIDCR) where he studied opioids, pain and analgesia in monkeys and rats, using behavioral, pharmacological and electrophysiological approaches. In 1995, Dr. Thomas joined the National Institute on Drug Abuse where he worked in the DBNBR. His program areas included pain and analgesia, opioids technologies and the abuse liability of analgesics. He is co-chair of NIDA Prescription Opioids and Pain workgroup, which fosters pain and opioid research and education. He is also an original and current member of the NIH Pain Consortium, which promotes pain research across the NIH, and he leads the NIH Pain Consortium's Centers of Excellence in Pain Education program, which promotes pain education in medical, nursing, pharmacy and dental schools. He will bring these many skills with him to DCNBR and will work to enhance interactions with the other Divisions and to promote the mission of NIDA.

Dr. Albert Avila is serving as Acting Director, Special Populations Office.

Dr. Minna Liang, OEA, was promoted to NIDA Referral Officer in July 2013.

Departures

Afomeya Agonafer, OD, left NIDA on July 27, 2013 to become a Secretary for the Deputy Director of NCCAM in the Office of the Director. Afomeya began her career at NIDA in 2002 in the Office of the Director/Executive Secretariat and in 2011, her exceptional administrative management skills were recognized by senior staff, which led to her serving as Secretary in the OD to the NIDA Deputy Director from 2011-2013. Afomeya is known for her superb organizational skills, poise and professionalism.

Tanya Barnett joined NIDA OEA as an extramural support assistant (ESA) in 2006 and progressed to Task Leader within DEAS and to Lead ESA position in 2012. She left NIDA for the Office of Disease Prevention (NIH OD) as Program Specialist in June 2013. Tanya served as ESA for NIDA Centers reviews and for many other complex NIDA reviews. Her professionalism, general good nature, writing, editing and database skills will be missed.

Dr. Kate Bent joined NIDA in late February 2013 as Deputy Director of NIDA OEA. She came to NIDA from CSR, where she had served as Chief of the Health Care Delivery and Methodologies IRG and more recently as Senior Advisor to the CSR Director. At NIDA OEA, Kate served as Acting Referral Officer, Privacy Act Coordinator, and clinicaltrials.com representative. Kate joined the FDA in July 2013 as an Assistant Commissioner for Policy.

Sonya Freeman who joined NIDA OEA as an ESA in 2006, was ESA for NIDA's training committee, aided many other NIDA reviews and also served as the office Purchasing and Travel specialist. In June 2013, she joined NHLBI's Office of Committee Management. Sonya was especially known for her work ethic, notable attention to details, organizational skills and persistence, as well as her marvelous laugh.

Khaled Gohar joined NIDA's Office of Acquisitions (OA) in February 2013 and transferred to SAMHSA in September 2013. During his tenure, Khaled worked for the NIMH Section of OA as a Contract Specialist.

Dr. Takato Hiranita, of the Molecular Targets & Medications Discovery Branch, of NIDA's Intramural Research Program (IRP), has accepted the position of Pharmacologist at the Food and Drug Administration, National Center for Toxicological Research, Jefferson, Arkansas

Dr. Diane Lawrence, former Associate Director of NIDA's AIDS Research Program, joined the National Institute of Allergy and Infectious Diseases' Pathogenesis and Basic Research Branch in June 2013. At NIAID she is managing grants and contracts that support basic and applied preclinical research.

Dr. Michael McDannald, of the Cellular Neurobiology Research Branch of NIDA's IRP, a recent K99 recipient, has received a tenure-track offer from MCG.

Bridget McDonald, an Administrative Services Agent in the Office of Management/Administrative Management Branch resigned on August 1, 2013.

Dr. Mary Ellen Michel, former Deputy Director of the CCTN, joined the National Center for Medical Rehabilitation Research (NCMRR) program at the National Institute of Child Health and Human Development (NICHD) in June 2013. At NICHD, she is managing clinical programs on head injury, stroke and rehabilitation. Dr. Petra Jacobs is serving as Acting Deputy Director, CCTN.

Fabienne Saint-Preux, IRP, has left the Molecular Neuropsychiatry Section as a Post-baccalaureate IRTA to attend medical school at Saint Louis University. Fabienne participated in NIDA IRP's Scientific Director's Fellowship for Diversity in Research (SDFDR). She started at NIDA-IRP in August 2011 and published a first author paper in April 2013.

Dr. Mariela Shirley, NIAAA, has served for over one year on a part time detail to facilitate collaborative initiatives on child and adolescent research and comorbidity with DCNBR and NIDA's Child and Adolescent Workgroup. She has recently taken a new position with NIH's Office of Women's Health as the Associate Director of Special Projects and Centers.

Dr. David Shurtleff, Acting Deputy Director, left NIDA on June 1, 2013 to become the Deputy Director of NCCAM. In his new position, he will play an important role in directing NCCAM's scientific, programmatic, and administrative initiatives. David's 18-year career at the NIH began at NIDA as a health scientist administrator in the Behavioral Sciences Research Branch. Within DBNBR, he served in various leadership roles: Acting Deputy Director of NIDA's Division of Neuroscience and Behavioral Research; the Division's Deputy Director; and from 2001 to 2011, he served as the Director of NIDA's Division of Basic Neuroscience and Behavioral Research. In January 2011, David assumed the position of Acting Deputy Director of NIDA and during his tenure, played an important role in the development, implementation, and management of the Institute's broad grant portfolio covering basic cellular, molecular, and systems neurobiology as well as behavior, treatment, medication development, clinical neuroscience, clinical trials, prevention, and health services research.

Dr. Jonathan Slezak, of the Molecular Targets & Medications Discovery Branch, IRP, has accepted the position of Assistant Professor at the Department of Psychology in the School of Natural Science and Mathematics at Mount St. Mary's University, Emmitsburg, Maryland.

Ingrid Tulloch, IRP, has left the Molecular Neuropsychiatry Section as a Postdoctoral Fellow to teach as a full-time Assistant Professor at Stevenson University in the Psychology Department.

Dr. Louise Wideroff of the Division of Basic Neuroscience and Behavioral Research has accepted a position for a promotion at the National Eye Institute where she will oversee programs in epidemiology. While at DBNBR, Dr. Wideroff handled a portion of the statistical genetics portfolio, coordinated the DBNBR SBIR program, and was the NIDA representative to the H3Africa program.

Retirements

Dr. Tom Aigner of the Division of Basic Neuroscience and Behavioral Research has retired after 31 years of federal government service. Dr. Aigner earned his B.S. degree in psychology/statistics and his M.S. in pharmacology at the University of Houston. He earned his Ph.D. in Pharmacology at the Medical College of Virginia. He was a postdoctoral fellow and research associate at the University of Chicago where he worked in the Department of Psychiatry under Charles Schuster and Chris Ellyn Johanson and then as a research associate in the Department of Surgery under Chris Zarins, M.D. Tom joined NIH in 1982 as an intramural staff scientist in Mortimer Mishkin's NIMH Laboratory of Neuropsychology. In 1995, Tom moved to his present position as a Health Scientist Administrator at NIDA, where he administers a portfolio of grants in neuroimaging in animals and nanotechnology. Dr. Aigner has published widely in the area of drug abuse and addiction with significant contributions in studies of the neuropsychopharmacology of memory and visual recognition in rats and non-human primates. Along with Weiss, S.R.B., and Post, R.M., Dr. Aigner holds Patent No. 4,942,182, (Treatment for cocaine addiction). Tom has represented NIDA on many NIH committees and work groups, has contributed a great deal to DBNBR and has been a creative presence in the division.

Garveyette Brown retired after a Federal career spanning thirty-nine years. Since 1965 she has held a wide variety of positions including Clerk-Typist at the U.S. Civil Service Commission, secretary at the U.S. House of Representatives and the U.S. Senate, Communications Industry Analyst at the Federal Communications Commission (FCC), and teacher of second and third grade students in the District of Columbia. Following all these positions, Garveyette joined the Federal Government, accepting a position as Program Assistant with NIDA/OSPC/PILB and NIDA/DESPR/OD where she has served until her retirement on August 31, 2013.

Dr. Teresa Levitin joined NIDA in 1996 as Deputy Director of the Office of Extramural Program Review after positions with NIMH and CSR. She became Director of OEPR (which was later renamed OEA) in 1997 and retired from federal service in February 2013. Teri's many contributions to NIDA included her numerous activities within NIDA OEA, across NIDA, and across NIH. Among many and various responsibilities, she served as Executive Secretary for NIDA Council, NIDA Research Integrity Officer, NIDA's EPMC representative, and as advisor and friend to many in the NIDA and NIH community. Teri's positive outlook, ability to create a nurturing and supportive workplace, focus on the quality of the work product, and her remarkable verbal, writing and editing skills, were gifts she willingly shared and will long be remembered for.

Donna Tolson, a Lead Administrative Officer in the Office of Management/Administrative Management Branch retired on May 31, 2013 after 36 years of service, the last 26 of which were with NIDA. During her tenure at NIDA, Donna made many significant administrative contributions, and received multiple awards and recognition for leading several IC initiatives and for her support of the NIDA Office of the Director.