

RESEARCH NEWS

Progress Made in Understanding Neurobiological Basis for Relapse to Cocaine Abuse

Researchers from the Albert Einstein College of Medicine and NIDA's Intramural Research Program have made a major advance in understanding the neurobiological basis for cocaine abuse relapse. It had been known previously that the learning of associations between environmental cues and taking drugs occurs in the hippocampus and that these cues are a major cause of relapse to drug-taking behavior. Now scientists have pinpointed the region (the ventral subiculum area) of the hippocampus and the neurobiological factors (glutamate neurotransmission) that may play an integral role in cocaine abuse relapse.

To arrive at these findings, the researchers first conditioned rats to obtain cocaine by pushing a lever (cocaine-seeking behavior). After this behavior had been well established, saline solution was substituted for cocaine. When the rats no longer received cocaine by pushing the lever, they greatly decreased their lever pushing. The investigators electrically stimulated and injected pharmacological compounds into rats' brains to regenerate cocaine-seeking behavior, and then mapped those brain areas involved in the animals' revived interest in seeking the drug (as measured by increased lever pushing).

■ **WHAT IT MEANS:** The findings from this study suggest that agents based on glutamate are promising candidates as potential medications for cocaine addiction, particularly in preventing environmental cue-induced relapse.

The study is published by lead investigator Dr. Stanislav R. Vorel in the May 11, 2001, issue of *Science*. It is available online at the journal's Web site www.sciencemag.org.

Study of Nearly 60,000 Drug Users Shows that Regular Drug Abuse Treatment Coupled with Outpatient Medical Care Helps Cut Hospitalization

Drug users are twice as likely to visit an emergency room and nearly seven times more likely to be hospitalized than comparably aged persons who do not use illicit drugs.

Researchers who studied hospitalization rates for nearly 60,000 drug users—almost 20 percent of whom were infected with HIV—found that hospitalization rates were lower for those receiving regular outpatient and drug abuse treatment.

The University of Pennsylvania-based researchers looked at the medical and drug treatment services received by 58,243 drug users enrolled in the New York State Medicaid program from Federal fiscal year 1996 through 1997; 11,556 were infected with HIV. Data were obtained from Medicaid claims for all ambulatory services from physicians, clinics, and drug abuse treatment providers.

Each drug user's pattern of outpatient care based on Medicaid claims in 1996 was categorized as regular drug abuse care only, regular medical care only, both, or neither. Regular drug abuse care was defined as care from a single methadone or drug-free treatment program for at least six contiguous calendar months in 1996. Approximately 40 percent of the study population had regular drug abuse care alone or with regular medical care in 1996, but a higher proportion of HIV+ drug users had regular care of both types.

A regular source of medical care was defined as a clinic or physician visited at least twice as an outpatient during 1996. Over half of the study population had regular medical care.

The following year, 1997, more than half (55.6 percent) of the HIV+ group and one-third (37.5 percent) of the HIV- group had at least one hospitalization. Those who were hospitalized spent nearly one month as outpatients over the course of the year. In both groups, those with regular drug abuse care only, or with regular medical care, had the lowest proportions of hospitalization in 1997. For HIV+ drug users, regular drug abuse care coupled with regular medical care was associated with a nearly 25 percent reduction in their predicted rates of hospitalization. Among HIV- drug users, regular drug abuse treatment alone or with regular medical care was associated with more than a 25 percent reduction in predicted rates of hospitalization.

In both groups, the likelihood of hospitalization was greater for persons with drug abuse or medical complications during 1996. Acute alcoholism-related complications were associated with the greatest increase in the likelihood of hospitalization.

- **WHAT IT MEANS:** Medical and drug abuse treatment in ambulatory services may have substantial benefits beyond reducing medical and drug-abuse related complications. Efforts to promote access to and retention in medical care and drug abuse treatment appear to be attractive strategies for improving the health of this medically complex population.

The study was published by lead investigator Dr. Barbara Turner in the May 9, 2001, issue of the *Journal of the American Medical Association*. The paper can be viewed online at the journal's Web site <http://jama.ama-assn.org>.

NEW PUBLICATIONS

New Research Report Available on Hallucinogens and Dissociative Drugs, Including LSD, PCP, Ketamine, Dextromethorphan

Drugs with street names like acid, angel dust, and vitamin K distort the way a user perceives time, motion, colors, sounds, and self. These drugs can disrupt a person's ability to think and communicate rationally, or even to recognize reality, sometimes resulting in bizarre or dangerous behavior. Hallucinogens such as LSD cause emotions to swing wildly and real-world sensations to assume unreal, sometimes frightening aspects. Dissociative drugs like PCP and ketamine may make a user feel disconnected and out of control.

In addition to their short-term effects on perception and mood, LSD is associated with psychotic-like episodes that can occur long after a person has taken the drug, and PCP and ketamine can cause respiratory depression, heart rate abnormalities, and a withdrawal syndrome. Use of LSD and other hallucinogens by secondary school students has declined since 1998, but ketamine and LSD are becoming more widely used at dance clubs and all-night raves by older teens and young adults.

NIDA research is developing a clearer picture of the dangers of these mind-altering drugs. The scientific information in this report was compiled to inform readers and to strengthen prevention and treatment efforts. Topics covered in the report include the following:

- What are hallucinogens?
- What are dissociative drugs?
- What are the facts about dissociative drugs?
- Where can more scientific information on hallucinogens and dissociative drugs be found?

Hallucinogens and Dissociative Drugs, Including LSD, PCP, Ketamine, Dextromethorphan is the newest publication in NIDA's Research Report series.

It can be downloaded from NIDA's Web site at www.drugabuse.gov or ordered by writing the National Clearinghouse for Alcohol and Drug Information, P.O. Box 2345, Rockville, MD 20852, or calling 1-800-729-6686.

UPCOMING EVENTS

- July 19-20, 2001: MDMA (Ecstasy) Research: Advances, Challenges, and Future Directions, William H. Natcher Conference Center, NIH Campus, Bethesda, MD.
- August 9-10, 2001: 2nd National Conference on Drug Abuse Prevention Research: A Progress Report, Omni Shoreham Hotel, Washington, DC
- September 24-26, 2001: Bridging the Power of Science and Culture to Improve Drug Abuse Research in Minority Communities, Wyndham Franklin Plaza Hotel, Philadelphia, PA.

Watch upcoming issues of *NewsScan* for more information on these events, or call NIDA at 301-443-6245.

For more information about any item in this NewsScan:

- Reporters, call Michelle Muth at 301-443-6245 in the NIDA Press Office.
- Congressional staffers, call Keith Van Wagner, NIDA Congressional Affairs Office, at 301-443-6071.

The National Institute on Drug Abuse is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports more than 85 percent of the world's research on the health aspects of drug abuse and addiction. The Institute carries out a large variety of programs to ensure the rapid dissemination of research information and its implementation in policy and practice. Fact sheets on the health effects of drugs of abuse and other topics can be ordered free of charge in English and Spanish by calling NIDA Infobox at 1-888-NIH-NIDA (644-6432) or 1-888-TTY-NIDA (889-6432) for the deaf. These fact sheets and further information on NIDA research and other activities can be found on the NIDA home page at <http://www.drugabuse.gov>.