NIDA
NATIONAL INSTITUTE
ON DRUG ABUSE

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NewsScan
NIDA ADDICTION RESEARCH NEWS

NEWS UPDATE

Research News

Researchers Report First "Genome Scan" for Drug Abuse

Results of a genome-wide search, or "genome scan," by a team of researchers led by Dr. George Uhl, from the National Institute on Drug Abuse (NIDA) in Baltimore, Maryland, provide the first evidence that specific regions of the human genome differ between abusers of illegal drugs and nonabusers. The findings of Dr. Uhl and his colleagues are an important step toward identifying genes that affect a person's vulnerability or resistance to substance abuse, and offer hope for identifying individuals at high risk for addiction and matching abusers with the most effective treatments.

The researchers looked for differences in the frequency of 1,494 genetic variants known as SNPs (single nucleotide polymorphisms, or "snips") between DNA samples from 667 unrelated individuals with a history of heavy drug use and 338 individuals with no significant lifetime use of any addictive substance (controls). Using the SNP markers, whose locations in the genome are known, the research team identified more than 40 regions across the genome that differ between drug abusers and controls in DNA samples from both European Americans and African Americans. Eight of these regions previously have been linked to alcohol or nicotine dependence, suggesting that genes in these regions contribute to individual vulnerability to abuse of multiple substances.

Studies have shown that genetic factors account for about half of human drug abuse vulnerability (environmental factors account for the other half), but researchers have not yet identified the individual genes that are involved. "Once you identify the genes, then you can ask, 'What part does this specific gene play in the overall drug abuse problem?'" Dr. Uhl says. He hopes this research will provide "knowledge about this genetic half of the problem that we can use to better match the preventions and the treatments to the people who are most likely to benefit from them."

WHAT IT MEANS: Scientists have known that genetic factors play a role in determining a person's vulnerability to substance abuse. The findings of this study identify specific regions of the human genome that may be involved, narrowing the search for genes that make a person more or less susceptible to addiction. Identifying these genes will shed light on the mechanisms of addiction and may make it possible to target treatments and prevention efforts to those individuals most likely to benefit.

The study by Dr. George Uhl, Dr. Qing-Rong (Tim) Liu, Ms. Donna Walther, and Ms. Judith Hess of the NIDA Intramural Research Program, and Dr. Daniel Naiman of the Johns Hopkins University appears in the December issue of the *American Journal of Human Genetics*.

Newly Discovered Receptor May Be Important In the Development of Antipsychostimulant Medications

Scientists at the Oregon Health and Science University have discovered and characterized a receptor for trace amines that may be instrumental in developing new antipsychostimulant medications.

The investigators characterized a G-protein-coupled receptor called trace amine receptor (TAR) which stimulates the production of cAMP when exposed to the trace amines tyramine, tryptamine, octopamine, and para-tyramine. This latter substance is structurally and functionally related to amphetamines.

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Although TAR is found in humans, the scientists used rats to demonstrate that beta-PEA for beta-phenylethylamine, a substituted amphetamine that represents a class of hallucinogens that include mescaline, MDMA (known on the street as "ecstasy"), and MDA, is the substance that most increased the receptivity of TAR. This finding suggests that the effects of amphetamines may be mediated in part by the TAR receptor.

■ **WHAT IT MEANS**: The results of this study indicate that the activation of TAR may be responsible for some of the psychological effects of psychostimulants; therefore, TAR may represent an important new target for the development of anti-psychostimulant medications.

A research team headed by Dr. David K. Grandy and including James R. Bunzow, and Drs. Susan Amara and Mark Sonders published the study in the December 2001 issue of *Molecular Pharmacology*.

News from NIDA

Dr. Glen Hanson Named Acting Director of NIDA

Glen R. Hanson, Ph.D., D.D.S., has been named the Acting Director of the National Institute on Drug Abuse by Ruth Kirschstein, M.D., Acting Director of the National Institutes of Health (NIH).

Dr. Hanson assumed his duties on December 1, 2001. His appointment follows the resignation of Dr. Alan I. Leshner, who served as NIDA's director since 1994 and who left to become the Chief Executive Officer of the American Association for the Advancement of Science.

Dr. Hanson is recognized as an expert on psychostimulants. He is particularly known for his work on the neurotoxic properties of ecstasy (MDMA) and amphetamines, as well as for his research into the role of brain peptides in psychiatric and neurological functions. As a researcher, he has been supported by grants from NIDA and the National Institute of Mental Health since the early 1980s and in 1998 received a Senior Scientist Award from NIDA. Dr. Hanson has served on several grant review committees for NIH and on the editorial board of the *Journal of Pharmacology and Experimental Therapeutics*. He is a frequent reviewer for most of the major pharmacology and neuroscience journals.

Dr. Hanson joined NIDA in September, 2000 as Director of NIDA's Division of Neuroscience and Behavioral Research. He is a professor in the University of Utah's Department of Pharmacology and Toxicology and holds a D.D.S. from the University of California, Los Angeles, and a Ph.D. from the University of Utah. From 1978 to 1980, Dr. Hanson was a Fellow in the NIH Pharmacology Research Associates Training Program.

Upcoming Events

NIDA Sponsors Blending Clinical Practice and Research Conference in New York City March 14-15, 2002

As in other fields of medicine, a gap exists in the drug abuse treatment field between clinical practice and scientific research. To help close this gap, NIDA is sponsoring a conference, **Blending Clinical Practice and Research: Forging Partnerships to Enhance Drug Addiction Treatment**, at the Grand Hyatt New York on March 14 and 15.

This meeting will provide an important opportunity for clinicians and researchers to examine cutting-edge scientific findings about drug abuse and addiction and their application to clinical practice. Conference participants also will have the opportunity to help determine additional areas in need of research related to drug addiction treatment.

Teams of nationally recognized clinicians and researchers will conduct plenary presentations and workshops on a

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variety of relevant topics, including: innovations in behavioral therapies to treat addiction; development of medications to treat addiction; club drugs; gender issues in addiction; drug abuse and infectious diseases; and craving and relapse.

Drug treatment counselors, social workers, health care providers, criminal justice staff, marriage and family counselors, public health workers, and clinicians are expected to attend. Civic leaders and policymakers who wish to learn more about drug addiction and its treatment also are invited.

Media representatives are invited to attend. For more information, call the NIDA press office at 301-443-6245 or check the conference Web site at **http://www.mac1988.com/BlendingNYC**.

For more information about any item in this *NewsScan*:

- **Reporters**, call **Michelle Muth**, NIDA Press Office, at 301-443-6245
- **Congressional staffers**, call **Mary Mayhew**, NIDA Office of Science Policy and Communications, 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 Infofax* 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**.

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