



The Disease of Addiction: New Strategies for Prevention and Treatment

February 2007

Every year, nearly 4 million Americans receive treatment for substance abuse and addiction. Almost 20 million more need treatment but do not receive it. The medical and social consequences of untreated drug addiction can be devastating. Tobacco use alone kills nearly half a million Americans each year. Other chemical addictions boost the risk for HIV/AIDS, tuberculosis, fetal abnormalities and illness, and can lead to increased crime and violence—problems that can impact individuals, families, and entire communities.

The National Institutes of Health (NIH), principally through its National Institute on Drug Abuse, supports research at the nation's medical schools and teaching hospitals to better understand the disease of addiction and develop more targeted strategies for its prevention and treatment.

Below are examples of recent NIH-funded research advances in the area of addiction:

Understanding Addiction

A population-based study of twins conducted by the **Virginia Commonwealth University School of Medicine** found that genetic factors may play an important role in a person's use/misuse of or dependence on illicit drugs like marijuana, opiates, and cocaine.

Johns Hopkins University School of Medicine researchers have found that men's brains show evidence of up to three times the amount of the brain chemical dopamine as women's brains when exposed to amphetamines. This is the first clinical study to explain why more men than women abuse amphetamines and could lead to tailored treatments for drug abuse and neurological diseases.

Using high-powered imaging techniques, researchers at the **David Geffen School of Medicine at UCLA** proved that there are structural abnormalities in the brains of chronic methamphetamine users.

Researchers at **Emory University School of Medicine** have discovered a key receptor for a brain chemical involved in addiction, obesity, and other neurological processes. This is the first study to find evidence for specific cocaine- and amphetamine-regulated transcript peptide receptor binding.

Progress on New Treatments

Scientists at the **University of Pennsylvania School of Medicine** and **Columbia University College of Physicians and Surgeons** collaborated on a research study that showed the efficacy of a sustained-release, injectable drug called naltrexone as a treatment for opioid dependence.

In animals, vaccines against cocaine and methamphetamine are possible and effective, according to research conducted by **Baylor College of Medicine, Michael E. DeBakey Veterans Affairs Medical Center, and Ben Taub General Hospital**. A vaccine to block the effects of these drugs in the human brain may be a future method of alleviating addiction.

Here are other recent breakthroughs in pioneering NIH-funded research at U.S. medical schools and teaching hospitals:

The Jan. 22, 2007 Fulfilling the Promise Capitol Hill briefing on "The Disease of Addiction: New Strategies for Prevention and Treatment" featured :

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

**Charles O'Brien, M.D.,
Ph.D.**, Kenneth Appel
Professor, University of
Pennsylvania/ Veterans
Affairs Medical Center

View the Webcast at:
www.aamc.org/ftp

Fulfilling the Promise is a special AAMC initiative highlighting the collaboration between U.S. medical schools and teaching hospitals, and the National Institutes of Health (NIH). As research engines of the U.S. health system, the nation's medical schools and major teaching hospitals are awarded more than half of all NIH grants to scientists through its extramural research program. For more than 60 years, this powerful partnership has provided the public with extraordinary advances in medical research and the very best health care.

More information
www.aamc.org/ftp

Watch for information
about the next Hill
briefing in:

Spring 2007

Breakthrough in Alzheimer's genetics research

In January, investigators uncovered a major new gene relating to late-onset Alzheimer's disease. A study conducted at **Case Western Reserve University School of Medicine** identified the gene SORL1—only the second gene discovered for late-onset Alzheimer's (the first was identified in 1993). Variants in SORL1 were found to be more common in people with late-onset Alzheimer's than in healthy people of the same age.

http://mediswww.meds.cwru.edu/communications/news/news_release.cfm?news_id=21

Strep infections may trigger personality changes, nervous tics in children

In an eight-month study of nearly 700 children in a Florida public school system, **University of Florida College of Medicine** researchers found a rise in involuntary movements and disruptive behaviors that corresponded with a rise in strep infections. The research, released this month, adds weight to the notion held by some scientists that tics, personality changes, anxiety, and obsessive-compulsive disorder may be triggered by strep infections in some children. Group A streptococcal infections—which cause strep throat in some people but no symptoms in others—may cause the body's immune system to interact with brain cells to cause the psychiatric symptoms.

<http://www.news.health.ufl.edu/story.aspx?ID=4347>

Adults who live with children eat more fat

Adults living with children consume more saturated fat than those who do not, according to new findings from the **University of Iowa Roy J. and Lucille A. Carver College of Medicine**. Based on data from a federal survey, adults living with children ate 4.9 additional grams of fat daily, including 1.7 grams of saturated fat.

<http://news-releases.uiowa.edu/2007/january/010307adults-fat.html>

Enzyme improves muscle performance

A **Dartmouth Medical School** research team has identified and tested a gene that dramatically alters muscle metabolism and performance in lab mice, and could someday help treat muscle diseases and improve muscle endurance. The enzyme, called AMP-activated protein kinase, or AMPK, is directly involved in optimizing muscle activity.

http://dms.dartmouth.edu/news/2006_h2/14nov2006_witters.shtml

Brain bleeding common in newborns

Researchers at the **University of North Carolina at Chapel Hill School of Medicine** were surprised to discover that MRI scans revealed bleeding in and around the brains of 26 percent of babies born vaginally. However, most of the intracranial hemorrhages were fairly small and easily resolved, with the most probable cause being pressure on the baby's skull during delivery.

<http://www.unc.edu/news/archives/jan07/neonates013007.htm>

See how the NIH budget supports medical research

www.aamc.org/ftp/nih.htm

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