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Nicotine May Have More Profound Impact Than Previously Thought

Article adapted from sciencedaily.com and was originally published April 4, 2009.

Nicotine isn't just addictive. It may also interfere with dozens of cellular interactions in the body, new-Brown University research suggests. Conversely, the data could also help scientists develop better treatments for various diseases. Pharmaceutical companies rely on basic research to identify new cellular interactions that can, in turn, serve as targets for potential new drugs.

"It opens several new lines of investigation," said lead author Edward Hawrot, professor of molecular science, molecular pharmacology, physiology and biotechnology at Brown University.

Hawrot's research is highlighted in a paper published April 3 in the *Journal of Proteome Research*. He and a team set out to provide a more basic understanding of how nicotine affects the process of cell communication through the mammalian nervous system.

The Brown University researchers looked at a specific receptor (alpha-7 nicotinic acetylcholine receptor) in mouse brain tissue. A very similar receptor exists in humans. This receptor is the most perplexing of the so-called "nicotinic" receptors, so named because nicotine binds to them when it is introduced into the body. Most receptors are on the surface of cells and are sensitive to small signaling molecules such as the neurotransmitter acetylcholine, which is the naturally occurring signal the body uses to activate alpha-7 receptors.

Their discovery: 55 proteins were found to interact with the specific (alpha-7 nicotinic) receptor. Scientists had not previously known of those connections.

"This is called a "nicotinic" receptor and we think of it as interacting with nicotine, but it likely has multiple functions in the brain," Hawrot said. "And in various, specific regions of the brain this same alpha-7 receptor may interact with different proteins inside neurons to do different things."

One in particular — the G alpha protein — was among the most unexpected proteins to be identified in the study, as it is usually associated with a completely different class of receptors.

This finding is significant because G alpha proteins are involved in many different biochemical and signaling processes throughout the brain and the rest of the body. An example of the importance of G alpha proteins is that 40 percent of all currently used therapeutic drugs target a member of the large GPCR family of receptors.

The new finding suggests that the alpha-7 receptors have a much broader role in the body than previously suspected and that the newly identified associated proteins could also be affected when nicotine binds to the alpha-7 receptor. Nicotine may affect bodily processes — and perhaps the actions of other commonly used drugs — more broadly than was previously thought.

This advance could lead to the development of new treatments to combat smoking addiction. At the same time, the finding could also have future implications for diseases such as schizophrenia, Hawrot said.

Recent genetic studies have suggested that some cases of schizophrenia are associated with deletions where a block of genes, including the gene for the alpha-7 receptor, is missing. Hawrot said the connection, while not conclusive, offers hope for new strategies in the development of treatments for those suffering from the disorder.

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Researchers have found that a certain receptor, a site known to bind with nicotine, interacts with 55 different proteins. Nicotine may affect bodily processes — and perhaps the actions of other commonly used drugs — more broadly than was previously thought.

Flipping The Brain's Addiction Switch Without Drugs

Adapted from the original May 28, 2009 article on sciencedaily.com

When someone becomes dependent on drugs or alcohol, the brain's pleasure center gets hijacked, disrupting the normal functioning of its reward circuitry. Researchers investigating this addiction "switch" have now implicated a naturally occurring protein, a dose of which allowed them to get rats hooked with no drugs at all.

"If we can understand how the brain's circuitry changes in association with drug abuse, it could potentially suggest ways to medically counteract the effects of dependency," said Scott Steffensen, a neuroscientist at Brigham Young University who co-authored the study with two of his undergraduate students, one of his grad students, and a team of researchers at the University of Toronto.

Chronic drug users, as noted by previous research, can experience an increase of a naturally-occurring protein called BDNF (brain-derived neurotrophic factor) in the brain's reward circuitry, a region scientists call the ventral tegmental area. In this study, the researchers took the drugs out of the equation and directly infused extra BDNF onto this part of the brain in rats.

The Toronto team noted that a single injection of BDNF made rats behave as though they were dependent on opiates (which they had never received). Though rats instinctively prefer certain smells, lighting and texture, these rats left their comfort zone in search of a fix.

"This work may reveal a mechanism that underlies drug addiction," said lead author Hector Vargas-Perez, a neurobiologist at the University of Toronto.

The BYU team confirmed that the protein is a critical regulator of drug dependency. After the BDNF injection, specific chemicals that normally inhibit neurons in this part of the brain instead excited them, a "switch" known to occur when people become dependent on drugs.

Steffensen, who teaches in BYU's psychology department, says this work suggests that BDNF is crucial for inducing a drug dependent state, one important aspect of drug addiction.

Researchers Say Smokers Cost Employers in Missed Work Days, Poor Performance

Article taken from www.jointogether.org/news/research/summaries/2007/researchers-say-smokers-cost.html and was published on April 2, 2007

- A pair of new studies find that smokers take many more sick days annually than nonsmokers and perform worse when they are on the job
- Bloomberg News reported March 29.
- A Swedish study by Petter Lundborg and colleagues from Free University of Amsterdam found that smokers took an average of 34 sick days per year, compared to 20 per year for people who never smoked and 25 per year among former smokers.
- Sweden has one of the highest rates of sickness absence in the industrialized world; in the U.S., the average worker takes off nine days annually for illness. "The results suggest that policies that reduce and/or prevent smoking may also reduce the number of days of sick leave," wrote Lundborg.
- In a study of women in the U.S. Navy, San Diego State University researcher Terry Conway and colleagues found that smokers were more likely to be discharged for medical reasons, bad behavior, misconduct, drug misuse and personality disorders. Smokers also were more apt to resign from the Navy before serving their full terms, and were paid less.
- However, noted Conway, "Cigarette smoking might simply be a marker for other underlying factors such as nonconformity and high risk-taking, that contribute to poorer performance."

Smoking Bans Don't Hurt Bar, Restaurant Business

Article taken from www.jointogether.org/news/research/summaries/2009/study-smoking-bans-dont.html and was published on May 28, 2009

- Hospitality jobs are not affected by widespread indoor-smoking bans, according to a new report that says there is no economic justification for exempting bars and restaurants from smokefree-spaces laws.
- AHN reported May 20th that the study by Elizabeth Klein of Ohio State University and colleagues compared employment data from eight Minnesota cities that had implemented a variety of indoor-smoking bans to two cities that had no bans. The three-year study concluded that even the most restrictive laws did not cause job losses.

• "In the end we can say there isn't a significant economic effect by type of clean indoor air policy, which should give us more support for maintaining the most beneficial public health policies," said Klein. "The public-health benefit clearly comes from a comprehensive policy where all employees are protected from exposure to environmental tobacco smoke."

The National Children's Study launches in Waukesha County!

Information taken from www.nationalchildrensstudy.gov

On Monday, May 11, 2009 the National Children's Study Center for Waukesha County began knocking on doors in eligible neighborhoods in Brookfield, Dousman, Hartland, Oconomowoc, Pewaukee and the City of Waukesha. Haven't heard about the National Children's Study? Here is some information about the program.

The National Children's Study will examine the **effects of environmental influences on the health and development of 100,000 children across the United States**, following them from before birth until age 21. Waukesha County children have been chosen to participate in this project. The goal of the Study is to improve the health and well-being of children.

The Study defines "environment" broadly and will take a number of issues into account, including: natural and man-made environmental factors, biological and chemical factors, physical surroundings, social factors, behavioral influences and outcomes, genetics, cultural and family influences and differences geographic locations. Researchers will analyze how these elements interact with each other and what helpful and/or harmful effects they might have on children's health.

By studying children through their different phases of growth and development, researchers will be better able to understand the role of these environmental factors on health and disease. The Study will also allow scientists to find the differences that exist between groups of people, in terms of their health, health care access, disease occurrence, and other issues, so that these differences or disparities can be addressed.

The National Children's Study will be one of the richest research efforts geared towards studying children's health and development and will form the basis of child health guidance, interventions, and policy for generations to come. It is anticipated that the preliminary results from the first years of the Study will be available in 2011.

If you want more information about the National Study, visit the website, www.nationalchildrensstudy.gov or for information on the Study taking place in Waukesha County and how to participate, please contact:

Katie Miller, Community Liaison

National Children's Study Waukesha Vanguard Center
21075 Swenson Drive Suite 900
Waukesha, WI 53186



ARC Staff to Attend State Prevention Conference

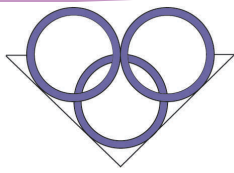
This year Jim Pearson and Brianna Duffy of the ARC staff will be attending the three-day State Prevention Conference in Stevens Point. The Wisconsin State Prevention Conference provides an unique opportunity for learning, sharing, and networking for the ARC staff as well as prevention professionals, educators, coalition members, law enforcement, juvenile justice workers, youth development providers, tobacco control advocates, public health and human service providers, mental health providers, and faith-based leaders and community members.

The conference offers a cross-cultural environment that provides innovative environmental strategies, evidence-based programs, and the latest research in the prevention field. The conference focuses on sustainability, capacity building, and fundraising, while providing an opportunity for new partnerships and networking among various systems and communities. Programs are designed to promote best practices, evidence-based programs, and innovative sustainability strategies, along with other environmental approaches, to help maintain prevention efforts throughout the state.

This 2009 State Prevention Conference is entitled, *Sustaining the Momentum of Change — Building Capacity through Evidence-Based Prevention* and will feature several keynote speakers, break out sessions as well as the SCAODA Public Forum, the Wisconsin Prevention Network Annual Meeting and the Alliance Regional Prevention Centers Meeting. The ARC staff will be attending several breakout sessions including, *Effective Planning for Prevention, Alcohol, Drugs and the Teenage Brain, Ethics in Prevention, Poverty Awareness for Community Engagement, Growing and Maintaining Strong Coalitions, Youth Voice—Best Practices and Emerging Evidence, From a Nudge to Changing Policy and The Role of Law Enforcement in Reducing Underage Drinking in Wisconsin*. The ARC staff is looking forward to the conference and is ready to implement new prevention strategies to strengthen and sustain its programs.

Information taken from the Wisconsin State Prevention Conference website:
<http://wch.uhs.wisc.edu/12-PrevConf/12-PrevConf-Main.html>

Since 1971, the Addiction Resource Council, Inc. has been providing affordable, cost-effective solutions to help address substance abuse and dependence problems.



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FOR AN ORDER FORM**

Upcoming Council Events

Addiction: Why Can't They Just Stop?



**July 6, 13, 20 and 27 (Monday
Evenings) from 6-8pm at**

**ProHealth Care
D.N. Greenwald Center
Education Room
240 Maple Ave
Mukwonago, WI 53149**

**No registration required. Call
262-524-7921 with questions.**

La Casa de Esperanza's 2009 Children's Summer Meal Program

June 15th - August 31 at

**La Casa de Esperanza
410 Arcadian Ave, Waukesha**

**FREE nutritious breakfast and
lunch served Monday through
Friday to anyone age 18 years
and under (21 years and under
for persons with disabilities.)**

Breakfast: 8:30-9:30 am

Lunch: 12:00 - 1:00 pm

**No registration is required. Call
262-542-3045 with questions.**