

Health Agencies Update

Warning System Aims to Detect Emerging Trends in Illegal Drug Use

A national surveillance system is being developed to use both traditional data collection strategies and scans of social media and web platforms to identify emerging designer synthetic drugs and their metabolites (<http://1.usa.gov/1mRwIXJ>).

The National Institute on Drug Abuse has given 5 years of funding to the University of Maryland's Center for Substance Abuse Research to develop the National Drug Early Warning System to monitor emerging trends related to illicit drugs.

The early warning system will establish a virtual community of US addiction specialists to detect emerging drug trends using national and local data from surveys, drug-related listservs and networks, and social media and web scans. It will also provide data to help dispatch rapid response teams to respond quickly to local areas found to be "hot spots" and disseminate information to the public using traditional and social media and websites.

Arsenic at Low Levels Linked With Cancer in Rodents

In a study that attempted to duplicate humans' exposure to arsenic throughout their entire lifetime, researchers at the National Institute of Environmental Health Sciences found significant increases in lung tumors in mice exposed to very low levels of arsenic, levels similar to those that humans might encounter (Waalkes MP et al. *Arch Toxicol*. doi: 10.1007/s00204-014-1305-8 [published online July 9, 2014]).

Millions of people obtain their drinking water from private wells, for which there are no established standards. Arsenic levels in public drinking water cannot exceed 10 parts per billion (ppb), but researchers say that because of differing rates of metabolism between humans and rodents, mice must be exposed to greater concentrations of arsenic in drinking water than humans to achieve the same biological dose and similar health effect.

During the study, male and female mice were given arsenic 3 weeks before breeding and throughout pregnancy and lacta-

tion. Arsenic was then given to offspring for up to 2 years at different concentrations, with 40 mice per group. In male offspring mice, 51% of those exposed to 50 ppb of arsenic and 54% of those exposed to 500 ppb of arsenic developed lung tumors (adenomas or carcinomas), compared with 22% of control mice. Interestingly, only 28% of male offspring exposed to 5000 ppb of arsenic developed lung tumors.

The investigators also noted an increase in lung adenomas in the 50-ppb group compared with controls (25% vs 11%) in female offspring.

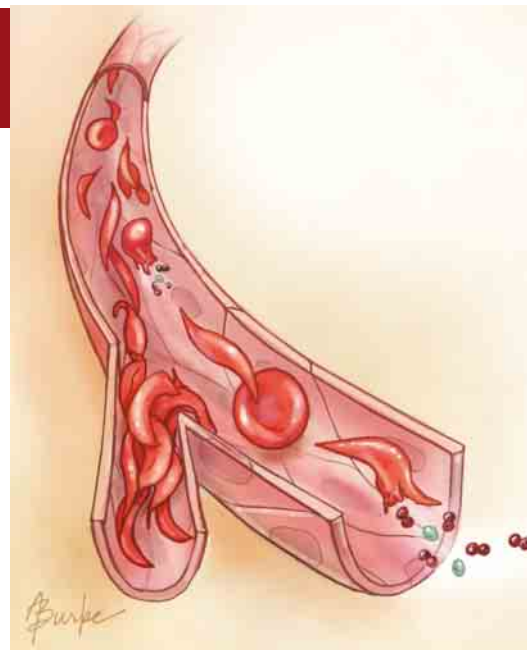
Sickle Cell Drug Candidate Under Development

For the first time, a pharmaceutical company has acquired a drug candidate developed with resources from a National Institutes of Health (NIH) program for rare and neglected diseases (<http://1.usa.gov/1kDK7XW>).

The drug, called Aes-103, treats sickle cell disease by binding directly to hemoglobin and changing its structure, thereby reducing the sickling of red blood cells. It is the first drug specifically developed to target the underlying molecular mechanism of sickle cell disease.

Despite promising data on Aes-103, AesRx, located in Newton, Massachusetts, had difficulty securing private financing. Researchers within NIH's Therapeutics for Rare and Neglected Diseases program signed a collaborative agreement with AesRx in 2010 and established a project team made up of government and industry scientists. The Therapeutics for Rare and Neglected Diseases program exists within NIH's National Center for Advancing Translational Sciences, which aims to bring together the necessary collaborators to overcome obstacles to translating basic research into clinical applications.

After preclinical studies led to an investigational new drug application and clearance with the US Food and Drug Administration, Aes-103 moved into phase 1 and 2 clinical trials. Baxter International recently acquired AesRx and now plans to advance the drug's clinical development.



A drug candidate for sickle cell disease that reduces sickling of red blood cells is entering clinical trials.

FDA Alert on Pure Caffeine Powder

The US Food and Drug Administration (FDA) has issued a warning to consumers about powdered pure caffeine, especially products that are sold in bulk bags over the Internet (<http://1.usa.gov/Ugb7Gn>).

One teaspoon of pure caffeine is roughly equivalent to the amount of caffeine found in 25 cups of coffee, according to the FDA. Symptoms of caffeine overdose may include rapid or dangerously erratic heartbeat, seizures, vomiting, diarrhea, stupor, and disorientation. The FDA is aware of at least 1 death of a teenager who used the products.

The FDA notes that it is nearly impossible to accurately measure powdered pure caffeine with common kitchen measuring tools, making it easy to consume a lethal amount. The agency is also concerned about the increasing amounts of caffeine in various food products and beverages, such as gum and energy drinks, that may be attractive and readily available to children and adolescents.

The FDA considers 400 mg of caffeine per day—approximately 4 or 5 cups of coffee—as an amount that is generally safe for adults. There is no set level of caffeine intake for children and adolescents, but the American Academy of Pediatrics discourages them from consuming caffeine and other stimulants. — Tracy Hampton, PhD