Biotech Business Week
Copyright 2006 Biotech Business Week via NewsRx.com

December 25, 2006

Section: Expanded Reporting

University of Chicago, U.S., officials announce the latest developments

University of Chicago, U.S.

University of Chicago, U.S., officials announce the latest developments.

This trend article is an immediate alert from NewsRx to identify the most recent news developments at University of Chicago, U.S.

Report 1: In a new study from Physiological and Biochemical Zoology, researchers from the University of Florida explore wiping behaviors in a tree frog that waxes itself, and test whether these frogs become dormant to conserve energy during dehydration.

Many amphibians have skin that offers little resistance to evaporative water loss. To compensate, these and some other arboreal frogs secrete lipids and then use an elaborate series of wiping motions to rub the waxy secretions over their entire bodies.

"This self-wiping is a complex behavior involving the use of all four limbs to stroke or rub all dorsal and ventral body surfaces, including the limbs," explains Nadia A. Gomez (University of Florida, Gainesville) and her coauthors. They continue: "Thus, the animal is protected from dehydration, provided the external film of lipids is not physically disrupted by movements or other disturbance."

Tree frogs characteristically go into a resting posture after wiping themselves, tucking their limbs tightly against or beneath their body and closing their eyes. The researchers found that this series of actions following "waxing" allows tree frogs (Phyllomedusa hypochondrialis) to limit rates of surface evaporation to as little as 4% of that from a free water surface in the same environment.

Report 2: A study of the sleep characteristics of 669 middle-aged adults found that people sleep much less than they should, and even less than they think.

Published in a recent issue in the American Journal of Epidemiology, the study also found that blacks sleep less than whites, men sleep less than women, and the poor sleep less than the wealthy.

Although participants spent an average of 7.5 hour a night in bed, they spent only 6.1 hours asleep. White women slept the most, 6.7 hours a night, followed by white men at 6.1 hours, black women at 5.9 hours and black men at 5.1 hours. Higher income also was associated with more sleep.

"People don't think they get enough sleep and they get less sleep than they think," said study author Diane Lauderdale, PhD, associate professor of health studies at the University of Chicago. "As we learn more and more about the importance of sleep for health, we find evidence that people seem to be sleeping less and less."

Studies suggest that average sleep times have declined since 1900, when people reported sleeping nine hours a night. Studies from the 1970s reported average sleep times closer to seven hours a night.

"Our study tells that we can't entirely trust those earlier surveys," Lauderdale said, "because people do not know how

much they sleep."

This was one of the first large studies to combine sleep diaries with a technique called wrist actigraphy that uses a motion sensor - worn like a watch - to measure not just when people go to bed but when they fall asleep.

Participants wore the device in the home for three days and nights. They also kept a log of their hours in bed.

Using the Actiwatch and nightly logs, Lauderdale and colleagues recorded how long people spent in bed (on average, 7.5 hours), how long it took them to fall asleep (22 minutes), how long they slept (6.1 hours), and their total sleep "efficiency" - time asleep divided by time in bed (81%).

They found that sleep duration and sleep efficiency were "remarkably lower" than values reported in most previous studies, noted Stuart F. Quan of the University of Arizona in a commentary.

The researchers were particularly surprised by the short span and poor quality of sleep among African-American men - 5.1 hours a night and 73% sleep efficiency.

"Although sleep scientists have generally accepted that the average sleep duration of Americans has been declining in parallel with our transformation to a frenetic 24-hour society," Quan wrote, "most sleep clinicians would consider those values indicative of sleep deprivation even by current standards."

Lack of sleep has long been connected with reduced ability to concentrate, trouble learning, decreased attention to detail and increased risk of motor vehicle accidents. More recent studies have tied chronic partial sleep deprivation to medical problems, including obesity, diabetes and hypertension.

This study may someday connect sleep loss to coronary artery disease. The 669 volunteers, aged 38 to 50, were recruited from the Chicago site (based at Northwestern University) of the CARDIA study, an ongoing project, begun in 1985, designed to assess long-term cardiovascular risk factors.

Although the study found significant variation based on race, sex and income it was not designed to get at the causes of those differences.

"People who make more money may have fewer worries," Lauderdale suggested, "or they may have more control over their sleep environment."

The findings, however, are "consistent with sleep being on the causal pathway between socioeconomic status (or race) and disease risk," the authors conclude.

Report 3: A climate scientist at the University of Chicago and 30 of her colleagues from across North America and Europe are urging the U.S. Fish and Wildlife Service to list the polar bear as a threatened species because global warming is melting its sea-ice habitat.

"As scientists engaged in research on climate change, we are deeply concerned about the effect of Arctic warming on the polar bear habitat," said a letter submitted to the Fish and Wildlife Service. "Biologists have determined that sea-ice is critical in the life cycle of the polar bear and the survival of the polar bear as a species.

Under the Endangered Species Act, the Fish and Wildlife Service is required to list a species for protection if it is in danger of extinction or threatened by possible extinction in all or a significant portion of its range. The ongoing and projected increased loss of sea-ice in the warming Arctic poses a significant threat to the polar bear."

The letter was not a petition, said Pamela Martin, Assistant Professor in Geophysical Sciences at the University of Chicago, who organized the effort. "Rather, it was a letter summarizing some key aspects of the best available science on global warming and, in particular, Arctic warming.

"The polar bear listing petition is really illustrative of the challenge in addressing many environmental problems facing us

as a global community. These problems don't fit squarely within a single scientific discipline-they not only require scientists to talk across disciplines, such as the geophysical and biological sciences as in the case of the polar bear, but also across the larger divide that separates scientists from policy makers."

The non-profit Center for Biological Diversity, based in Tucson, Ariz., filed a scientific petition with the Fish and Wildlife Service on Feb. 16, 2005, to list the polar bear as a threatened species under the Endangered Species Act. In February 2006, the Fish and Wildlife Service announced that it would initiate a status review of the polar bear to determine if the species should be proposed for listing. A 60-day public comment period, later extended, also began on Feb. 9.

Martin wrote and circulated the letter with the help of four colleagues in the University of Chicago Department of Geophysical Sciences: Gidon Eshel, Assistant Professor; David Archer, Professor; Douglas MacAyeal, Professor; and Ray Pierrehumbert, Louis Block Professor.

"Unlike many letters that circulate, this one did not circulate with the names of the signers," Martin said. "Thus, with the exception of the names of my colleagues from this institution, the scientists signed it blind with respect to other signators."

The letter states that "the best available observations demonstrate that Arctic warming is rapid, persistent, and widespread," and that only a reduction of technologically generated greenhouse gases can prevent further Arctic warming and sea-ice melting. The scientists summarized multiple lines of evidence that point to global warming trends, especially in the Arctic:

- An increase in surface temperatures of nearly 1 degree Fahrenheit since the late 19th century

- Warming of the world's oceans over the last 50 years

- Thawing of the northern high latitude permafrost (ground that was formerly frozen year-round)

- Increased evaporation over the tropics and subtropics

- An increase in the rate of sea-level rise

"In the Arctic, evidence from satellite data, submarine data, and oceanographic field observations reveal the diminished areal extent, shorter seasonal duration, and extensive thinning of sea ice," the letter said. "Summer sea ice cover in the Arctic has already been reduced in areal extent by 10-20% over the last 30 years."

The Arctic region is especially sensitive to global warming because of the reflectivity of ice and cloud cover, the scientists said. Despite slight cooling in some pockets of the Arctic, overall the region has experienced substantial warming. Records show that average annual temperatures are 3.5 to 5 degrees Fahrenheit warmer in Alaska and Siberia. Siberian winters and temperatures in the western Canadian Arctic, meanwhile, are 7 degrees warmer than before, the letter said.

The scientists also cited the 2001 Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Pierrehumbert served as lead author of this report, which involved the participation of more than 2,000 scientists from 100 countries. "The IPCC report concluded that the observed global climate changes cannot be accounted for by natural climate forcings alone;" said the scientists in their letter.

Additional research conducted since 2001 has strengthened the IPCC's findings, according to Martin and her colleagues. "In 2005, the Arctic Council, an intergovernmental forum with members from eight nations, including the United States, referenced the findings of the IPCC Third Assessment Report in their Arctic Climate Assessment and added that 'there is new and strong evidence that in the Arctic much of the observed warming over this period [the last 50 years] is also due to human activities."

"Immediate reductions of greenhouse gas emissions well beyond those that may be considered by some measures 'sustainable' emissions rates are therefore imperative. We urge the Fish and Wildlife Service to acknowledge the threat of

Arctic warming on the Polar Bear."

This article was prepared by Biotech Business Week editors from staff and other reports. Copyright 2006, Biotech Business Week via NewsRx.com.