A 'Fishy' Study Is Promising for Lung Infections

Here's another reason salmon and sardines can be a boon to human health.

A new study has found that omega-3 fatty acids—like those found in fish—may be key to helping the body combat lung infections.

People with inflammatory diseases like chronic obstructive pulmonary disease, or COPD, often are plagued by a type of bacteria that omega-3 derivatives are effective at clearing.

COPD is most often caused by years of smoking. Quitting smoking can slow its progress, but won't stop it, and anti-inflammatory drugs—the most common treatment—can put people at risk for secondary infections.

In a recent study in the *Journal of Immunology*, Richard Phipps, who holds the Wright Family Research Professorship in the Department of Environmental Medicine; Patricia Sime, chief of pulmonary diseases and critical care and the C. Jane Davis and C. Robert Davis Distinguished Professor of Pulmonary Medicine; and toxicology graduate student Amanda Croasdell tested the effectiveness of an inhalable omega-3 derivative to prevent bacterial lung infections. Unlike other anti-inflammatory drugs, the specialized agent used in the study reduced inflammation without suppressing the clearing of bacteria, and could hasten it.

ALPHA OMEGAS: Omega-3 fatty acids, like those found in fish, may be key to fighting bacteria in lungs.

Further study is needed to determine the effectiveness of the treatment in people, but the approach also shows promise for remedying other infections caused by the bacteria, including bronchitis, pneumonia, and ear infections.

—Susanne Pallo

A Little Bird Told Me …

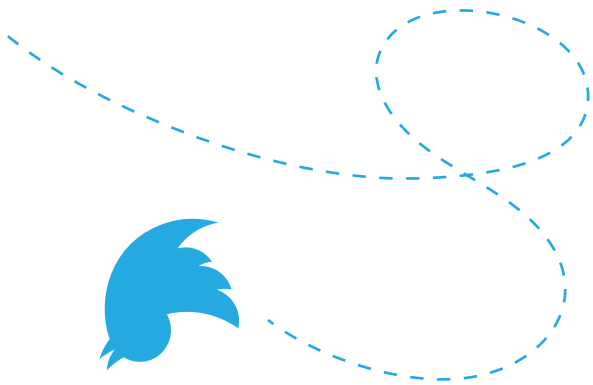
Can a computer tell if you've been drinking when you tweet?

New research suggests that it can. In an innovative test case for analyzing ongoing behavior by Twitter users, computer scientists have investigated drinking in different communities.

Computer science graduate student Nabil Hossain and collaborators taught computers to analyze tweets about drinking in an effort to predict where Twitter users are when they report drinking.

Hossain is a member of the computer science group led by Henry Kautz '87 (PhD), the Robin and Tim Wentworth Director of the Goergen Institute for Data Science.

Hossain is presenting the research at the International AAAI Conference on Web and Social Media, to be held in Germany in May. The paper was also posted on the arXiv.org repository.



An article in *MIT Technology Review* says the work is based on "two breakthroughs."

The first is a technique for training a machine-learning algorithm to differentiate between tweets in which people discuss drinking and tweets in which they indicate that they themselves are currently drinking.

The computers can distinguish between people who are tweeting about an activity in which they're presently engaged and those who have done it in the past or will in the future. The model could be applied to other behaviors.

The second breakthrough is a technique for locating tweeters' homes with greater accuracy than ever before—and thereby determining whether they're at home when they're drinking.

Until now, predicting social media users' home locations was done by establishing the place from which they most often tweet or the common location for their last post of the day.

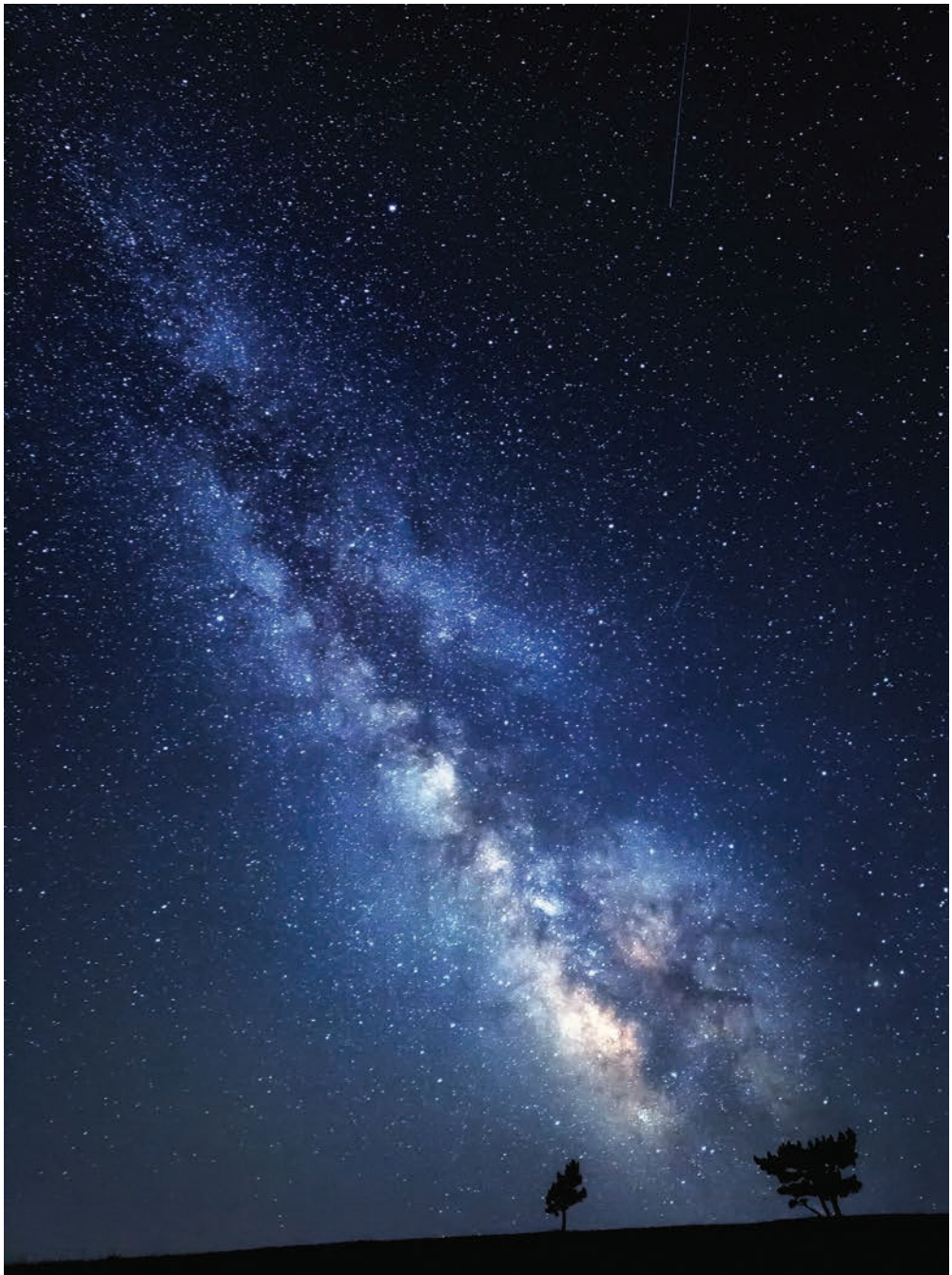
In the new work, researchers applied machine-learning techniques to identify in-the-moment user behavior.

That allowed them to predict users' home locations accurately within 100 meters.

When they combined the tools, researchers were able to discover patterns of alcohol use in urban and suburban settings, information that they hope can have applications for prevention and public health programs.

—Leonor Sierra

ADOBE STOCK (FISH); STEVE BOERNER (TWITTER)



Counting the Ages of Stars?

People tend to get a little set in their ways as they age. So, it turns out, do stars.

As stars grow older, their activity becomes more predictable, researchers have found. In a paper published in *Monthly Notices of the Royal Astronomical Society*, scientists describe a new conceptual framework for understanding how stars similar to the sun evolved. The researchers explain how investigating the physics behind the speeding up or slowing down of a star's rotation, its x-ray activity, and its magnetic field generation can allow scientists to begin to plot the evolution of stars.

Using the sun as the calibration point, the model describes how the sun likely behaved in the past and how it's expected to behave in the future. For stars of similar mass and radius, the model yields useful predictions.

Scientists aren't yet able to accurately predict a star's precise age, but lead author Eric Blackman, a professor of physics and astronomy, says that could be ahead. —Leonor Sierra

Solving a Calcium Mystery

Secretions like saliva and digestive juices are vital to countless activities that keep the human body running. Now a new study has uncovered a previously mysterious process that makes the secretions possible.

At the heart of the study is calcium, which is present in all human cells and acts as a kind of gatekeeper, opening up the channels that are required for the production and secretion of fluids like saliva.

For 15 years, David Yule, who holds the Louis C. Lasagna Professorship in Experimental Therapeutics, has studied calcium's role in disorders like acute pancreatitis and dry mouth conditions in which patients have difficulty chewing, swallowing, and speaking due to a lack of saliva.

In his new study, published in the journal *Science Signaling*, he answers a question that has stumped researchers for years: what does it take for a particularly important calcium channel to open and start secretion processes?

Scientists knew that a specific protein, one that is composed of four identical units, is necessary—but using advanced molecular engineering and gene-editing techniques driven by Kamil Alzayady, a research assistant professor in Yule's lab, the team discovered that all four units that make up the protein must be "turned on" for calcium to increase and start fluid secretion. Yule believes the complexity is likely a safety feature, ensuring that the calcium channel opens only in particular circumstances. That avoids harmful conditions that could result if it opened more easily, as too much calcium is also detrimental.

The team is continuing its research to investigate how genetic diseases affecting the protein result in brain and immune system disorders. —Emily Boynton

ADOBE STOCK