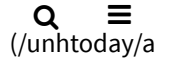




NEWSROOM (//WWW.UNH.EDU/UNHTODAY/NEWS)



New UNH Research Aims to Help Humans Survive Dehydration

Wednesday, September 5, 2018

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DURHAM, N.H.—A grant from the National Institutes of Health (NIH) will help a University of New Hampshire researcher better understand dehydration and ultimately help humans better survive it by studying a tiny desert rodent that’s adapted to survive both acute and chronic dehydration.

“We know that many people suffer from dehydration, from the elderly to soldiers in desert wars to the many people worldwide without access to clean water,” said Matthew MacManes (

MATTHEW MACMANES, ASSISTANT PROFESSOR OF GENOME-ENABLED BIOLOGY AT THE UNIVERSITY OF NEW HAMPSHIRE, RECENTLY WON A FIVE-YEAR, \$1.7 MILLION NIH MAXIMIZING INVESTIGATORS’ RESEARCH AWARD, WHICH WILL ALLOW HIS TEAM TO BETTER UNDERSTAND DEHYDRATION AND HOW HUMANS CAN BETTER SURVIVE IT THROUGH STUDYING A TINY DESERT RODENT THAT’S ADAPTED TO SURVIVE BOTH ACUTE AND CHRONIC DEHYDRATION.

PHOTO CREDIT: JEREMY GASOWSKI, UNH

“Understanding how mice survive dehydration may help us understand why humans don’t survive it, and maybe how we could help them.”

The five-year, \$1.7 million NIH Maximizing Investigators’ Research Award ([“This career-changing NIH grant will significantly advance Matt’s important work in understanding dehydration,” said Jan Nisbet, senior vice provost for research at UNH. “I congratulate him and look forward to the results of his research.”](https://urldefense.proofpoint.com/v2/url?u=https-3A__projectreporter.nih.gov_project-5Finfo-5Fdescription.cfm-3Faid-3D9575647-26icde-3D40766956-26ddparam-3D-26ddvalue-3D-26ddsub-3D-26cr-3D1-26csb-3Ddefault-26cs-3DASC-26pball-3D&d=DwMFaQ&c=c6MrceVCY5m5A_KAUkrdoA&r=43nhFYk7Lgb9QdQ_EwZ2RfOaAn9EEDYKO5BGcXFWdG0&m=dsSI6TQdx7-OB30kfZxbeeW2_d3RoYjh2e8t_X7E_5k&s=bZG-M099Wexs-YpQB7bnvw7sCoLmSqtSYtYwftITRel&e=) will allow MacManes and his team to study the physiology and genomics of cactus mice in the field and the lab.</p></div>
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Field work will take place in the southern California desert, where they'll capture mice and study their physiology — mainly electrolytes and urine concentrations — as well as population genomics to try to understand which parts of the genome are involved in helping the mice adapt to the desert. In the lab, researchers will monitor captive mice's metabolic rates, blood pressure and heart rate under different hydration scenarios for a deeper exploration of the physical response to dehydration. MacManes is looking at how the mice maintain blood pressure in their kidneys when they're severely dehydrated, as kidney failure is a serious impact of dehydration in humans.

"There's a molecule that seems to preserve blood pressure in their kidneys, and we can pharmacologically manipulate this molecule to study its role in protecting the kidneys," he said. He'll also be looking at the influence of diet — proteins and carbohydrates — on dehydration.

"What if we could help soldiers, or other people who have to work in hot, dry environments, survive dehydration by feeding them a particular diet?" MacManes says, about his long-term goals.

MacManes notes that this work is particularly relevant in a changing climate that's predicted to make much of the Earth, particularly North America, hotter and drier. "There are lots of places on the Earth where there will continue to be fresh water, but we can't all move there," he said.

The University of New Hampshire is a flagship research university that inspires innovation and transforms lives in our state, nation and world. More than 16,000 students from all 50 states and 71 countries engage with an award-winning faculty in top ranked programs in business, engineering, law, health and human services, liberal arts and the sciences across more than 200 programs of study. UNH's research portfolio includes partnerships with NASA, NOAA, NSF and NIH, receiving more than \$100 million in competitive external funding every year to further explore and define the frontiers of land, sea and space.

Editor's Notes:

EDITORS: Matt MacManes can be reached at Matthew.MacManes@unh.edu (<mailto:Matthew.MacManes@unh.edu>).

PHOTO FOR DOWNLOAD:

https://www.unh.edu/unhtoday/sites/default/files/media/macmanes_lab.jpg (https://www.unh.edu/unhtoday/sites/default/files/media/macmanes_lab.jpg)

Caption: Matthew MacManes, assistant professor of genome-enabled biology, recently won a five-year, \$1.7 million NIH Maximizing Investigators' Research Award (https://projectreporter.nih.gov/project_info_description.cfm?aid=9575647&icde=40766956&ddparam=&ddvalue=&ddsub=&cr=1&csb=default&cs=ASC&pball=), which will look at dehydration and ultimately help humans better survive it through studying a tiny desert rodent that's adapted to survive both acute and chronic dehydration.

Photo credit: Jeremy Gasowski, UNH

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