

Hope for healthy hearts revealed in naked mole rat studies

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Naked mole rats such as this one have excellent cardiovascular health to old age, shows a new study from the Barshop Institute for Longevity and Aging Studies at The University of Texas Health Science Center at San Antonio. Credit: UT Health Science Center San Antonio

Cardiovascular disease is the greatest killer of humans the world over, presenting huge financial and quality-of-life issues. It is well known that

the heart becomes less efficient with age in all mammals studied to date, even in the absence of overt cardiac disease. However, scientists still don't have a good understanding of how to prevent these functional declines that ultimately may lead to debilitating cardiovascular disease.

The longest-lived rodent, the naked mole rat, beats these odds and escapes cardiovascular aging, at least to ages equivalent to 92-year-old humans, according to researchers from the School of Medicine at The University of Texas Health Science Center at San Antonio.

Kelly Grimes, a graduate student in the lab of Rochelle Buffenstein, Ph.D., at the Health Science Center's Barshop Institute for Longevity and Aging Studies, conducted the first studies of naked mole rat cardiovascular function. Her findings support earlier studies that this species resists the common signs of aging.

Grimes found that, at rest, the [heart](#) of the naked mole rat beats very slowly (250 beats per minute). The rodent should have a heart rate twice as high for its body size. How much blood the heart pumps, how hard it contracts to pump the blood, and blood pressure in [naked mole rats](#) also are very low. "However, if they need to, for example during exercise, naked mole rats can ramp up their cardiac function with ease," Grimes said. "Their entire cardiovascular system seems to be optimized."

These data are from two papers recently published by Grimes and Dr. Buffenstein as part of a study supported by the American Heart Association. Dr. Buffenstein emphasized that the naked mole rat is unlike any other cardiovascular aging model studied.

"It looks like the naked mole rat maintains heart function at youthful levels at least till age 90," Dr. Buffenstein said. "Clearly these animals hold the secret to healthy hearts in aging humans."

Why do humans, rats, mice, monkeys, dogs and other animals show declines, but not the naked mole rat? Grimes is studying molecular mechanisms that might be protecting the naked mole rats' cardiovascular structure and function. The researchers think these protective mechanisms may be closely linked to the naked [mole rats](#)' natural habitat underground and exceptional stress resistance.

The two papers are in the *American Journal of Physiology - Heart and Circulatory Physiology* published by the American Physiological Society.

Provided by University of Texas Health Science Center at San Antonio

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