

New Discoveries in the Oldest-Living Dogs: Loss of Gonad Function Earlier in Life Jeopardizes Sturdier Living in Old Age

Latest Research on Linkage Between Hormones and Frailty Lays Groundwork for New Thinking About Healthier Aging: To Fight Late-Life Frailty, Take a Long View

WEST LAFAYETTE, IN, UNITED STATES, December 2, 2025 /EINPresswire.com/ -- Frailty threatens

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The work justifies a more informed focus on hormone history to confront a hidden adversity: Earlier hormone disruption can spell trouble later-in-life.”

David J. Waters, DVM, PhD

older individuals because it increases their vulnerability to detrimental health outcomes, such as falling, longer hospitalization, or even shortened life expectancy. New research exploring the linkage between frailty and mortality risk shows that early-life decisions leading to disruption of the body’s hormonal networks may render frailty more dangerous late-in-life. The work has important implications for healthier aging: Preserving gonad function as a potential strategy to fight late-life frailty.

The study conducted by scientists at the Gerald P. Murphy Cancer Foundation’s Center for Exceptional Longevity Studies was published in the [peer-reviewed scientific journal Scientific Reports](#).

The Gerald P. Murphy Cancer Foundation is a not-for-profit research institute focused on cancer and aging, based at the Purdue Research Park of West Lafayette.

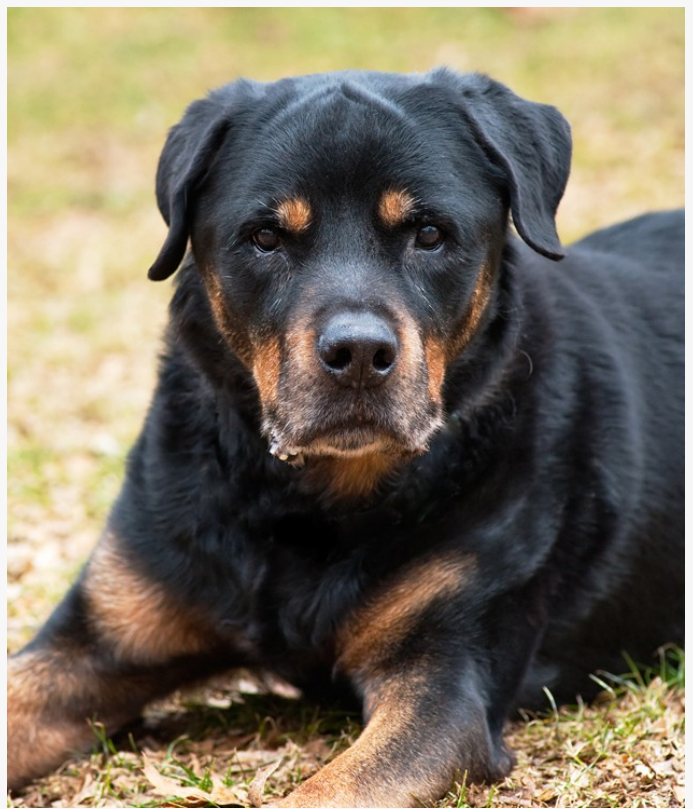
To date, research on physical frailty has focused mainly on understanding factors leading to frailty development to discover strategies that might prevent or postpone frailty. In contrast, relatively little attention has focused on factors that might influence frailty resilience, so that fewer adverse health consequences take place once frailty occurs. The results of the new study suggest that the HPG axis — the body’s system of regulating production of the hormone testosterone — can significantly impact the lethality of late-life frailty.

“Our work provides the first description of the relationship between HPG axis integrity and the mortality risk associated with late-life frailty,” said David J. Waters, DVM, PhD, Director of the [Murphy Foundation’s Center for Exceptional Longevity Studies](#). “Male dogs with the shortest

duration of testis exposure had a very high mortality risk associated with late-life frailty, whereas the mortality consequence of increasing frailty was erased in males with the longest gonad exposure.”

The work is important because it directly addresses a critical question: What factors shape the critical aspects of physiology – the critical context – that can reduce the adverse impact of increasing frailty on health outcomes, including mortality?

“As we turn our attention away from what increases frailty to what amps up its lethality, we pursue a different, more nuanced question,” said Waters, who serves as a Faculty Associate in Purdue University’s Center on Aging and the Life Course. By taking a long view, what scientists refer to as life course perspective, the investigators discovered the linkage between early disruption of hormonal networks and late-life consequences of frailty, exposing a hidden danger that lay dormant in these dogs for more than a decade.



“BORT” (pictured) IS ONE OF THE OLDEST MALE ROTTWEILERS LIVING IN NORTH AMERICA THAT INVESTIGATORS PUT TO WORK TO DISCOVER THE LINKAGE BETWEEN LIFELONG GONAD FUNCTION, LATE-LIFE FRAILITY, AND OVERALL MORTALITY RISK.

The uniqueness of the study was articulated by Markus H. Schafer, PhD, co-author of the study. “The research applies a life course approach to determine whether early-life events, such as endocrine hormone disruption, can buffer against late-life challenges,” said Schafer, who is Professor of Sociology at Baylor University, and whose academic work includes describing the buffering role social connections can exert on the loneliness of people living alone.

“The research reframes the role that gonadal hormones play in frailty development in older men to include a separate, yet complementary consideration — the significant influence gonad function exerts on the adverse consequences of frailty once it occurs,” Schafer continued.

The work is also notable for opening the door to a new research methodology: Enlisting the oldest-living dogs as our greatest teachers, a strategy laid out by Waters in a 12-minute TEDx talk. Waters leads a team conducting the first systematic study of exceptional longevity of companion dogs living in North America.

The Exceptional Aging in Rottweilers Study seeks to better understand highly successful aging and disease resistance through the study of the oldest-living Rottweilers. From this cohort of

dogs who have lived 30% longer than breed average — physiologically equivalent to 100-year-old humans — investigators construct lifetime medical histories using questionnaires, medical records, and phone interviews with dog owners. To capture a more detailed picture, Dr. Waters has conducted in-home scientific visits of over a hundred of these exceptional dogs living in 40 U.S. states and Canada. “In the new study, we capitalize on this lifetime cohort to test our hypothesis on gonad function fighting frailty by generating a frailty score in geriatric male dogs with a broad range of lifetime testis exposure and then following them from frailty scoring until time of death,” Waters said.

“These exceptional dogs offer a unique opportunity to explore the numerous ways that healthy life span can be extended,” said Waters.

The work in canines has already generated important insights into the linkage between ovaries and longevity and the relationship between early endocrine disruption and risk of cruciate ligament rupture. The new findings extend the investigators’ [recently published work on gonad function](#) and the likelihood of late-life robustness that are challenging conventional thinking about the health consequences associated with spaying or neutering companion dogs.

Waters put the Exceptional Aging in Rottweilers Study in perspective, noting that for centuries dogs have enriched people’s lives in important ways as our pets and our companions. Now, for the first time, the oldest-living dogs are being investigated with the hope that their extreme natural biology will offer up fresh scientific clues to advance geroscience.

To Waters, dogs stepping up to contribute a deeper understanding of what hormones mean to healthy aging makes perfect sense.

“In past decades, dogs have played a pivotal role in endocrine hormone research, including the discovery of insulin and the shrinkage of prostate cancers using androgen ablation,” stated Waters, who is Professor Emeritus, Department of Veterinary Clinical Sciences in Purdue’s College of Veterinary Medicine. “Our work signals an important step toward better understanding frailty resilience, advancing the prospect that by avoiding HPG axis deterioration we might retain an internal hormonal environment that buffers the adverse impact of deficit accumulation in old age.”

Waters points to the growing scientific interest in harnessing the domesticated dog population to pursue these kinds of underexplored research questions in the field of geroscience.

“We’ve identified a special group of dogs that can help to inform us about future research directions that will benefit companion dogs and people,” said Waters. “Our message to these dogs is simple: We’re ready to listen.”

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