



**AMERICAN
PSYCHOLOGICAL
ASSOCIATION**
SERVICES, INC.

For more information, contact:
Pat Kobor
pkobor@apa.org

UPDATED: MAY 2023

Animal research* yields crucial understanding of and treatments for Alzheimer's Disease

6.7 MILLION AMERICANS HAVE ALZHEIMER'S DISEASE. AND THIS NUMBER IS PROJECTED TO REACH NEARLY 13 MILLION BY 2050.¹

In the US, 1 in 9 people (11%) over 65 years of age live with Alzheimer's Disease (AD). AD is an incurable, debilitating disease, which is characterized by a progressive loss of memory, reasoning, and other cognitive abilities, as well as disorientation, behavioral, and mood changes.

Years of psychological scientific research has enabled the identification of changes in the brain that lead to these impairments, such as the progressive accumulation of certain proteins, which leads to plaques and tangles and causes degeneration of brain cells and behavior. Although significant progress has been made, there is still much to discover. **Animal research grounded in psychological science is necessary to fill many of the remaining gaps in our understanding of AD and approaches for successful treatment.**

Research with animals is necessary to find treatments for AD.

Psychologists conduct research using animal models to understand the differences between normal aging and pathology—for example, how AD affects memory and cognition; how physical activity may prevent or slow the development of AD; and how social interaction helps maintain brain health. Animal studies allow a level of laboratory control that isn't possible with human participants. These studies shorten the path to results.

Given that cognitive decline is expressed through an individual's behavior, AD cannot be replicated in cell cultures or computer simulations. It requires studying a living, behaving individual over the course of their lifetime and tracking both neurological and cognitive changes.

Animal research goes beyond AD. Findings from basic research with animals have played a vital role in our understanding of neurochemical mechanisms that underlie various conditions, including:

- Depression
- Anxiety
- Schizophrenia
- Substance Abuse
- Parkinson's Disease

This knowledge from psychological science captures the complexity of AD and is critical in the development of both prevention and treatments for such diseases.

Animal welfare is a priority.

Research conducted with animals is regulated at the local, state, and federal levels. A top priority for scientists, veterinarians, animal care personnel, and federally-mandated institutional animal care committees is ensuring the welfare and humane treatment of animals used in ethically and scientifically sound research.

Animal research is overseen at the federal level by the Department of Agriculture and the National Institutes of Health Office of Laboratory Animal Welfare. Voluntary accreditation bodies, such as the Association for Assessment and Accreditation of Laboratory Animal Care International, also set and enforce standards for the use of animals in research. This multi-level system of oversight ensures the highest standards for humane care and treatment of animals in research.

Research Approaches

- **Rodents.** Research in rodents, particularly mouse models of AD, has been critical for identifying the cellular, molecular, and genetic mechanisms of the disease. Mouse models of AD can be engineered to produce plaques and tangles but have limitations with regard to mirroring the full spectrum of the disease in humans. Rodents continue to be important models for basic research on AD,² but their limitations in therapeutic applications have highlighted the need for more translational animal models that better mimic the human symptoms of AD.³
- **Primates.** Primates have brains and behaviors that more closely resemble that of humans. They also live much longer than rodents, which is an important aspect of studying disease progression. Some primates naturally develop plaques and tangles in their brain as they age. Studying animals over their entire lifespan, with simultaneous tracking of changes in the brain, cognition, and behavior, holds tremendous promise for identifying disease culprits and testing interventions to address age-related cognitive decline.⁴
- **Other animal models.** Other species are being considered for AD research. Among them, the companion dog. Pet owners well know that older dogs may develop what is called “Canine Cognitive Dysfunction” (CDD), a syndrome that includes disorientation, increased anxiety, and cognitive decline. Up to 68% of 15- to 16-year-old dogs show signs of CDD.⁵ These changes can cause suffering in the dog and are also quite challenging for their caregivers, sometimes resulting in relinquishment to a shelter or premature euthanasia. As it turns out, the brains of older dogs also show pathology reminiscent of AD. Investigating CDD in dogs, for which extensive health records are available, may therefore provide new clues to the disease.⁶

APA is the leading scientific and professional organization representing psychology in the United States, with more than 146,000 researchers, educators, clinicians, consultants, and students as its members.

Our mission is to promote the advancement, communication, and application of psychological science and knowledge to benefit society and improve lives. We do this by:

- Utilizing psychology to make a positive impact on critical societal issues.
- Elevating the public’s understanding of, regard for, and use of psychology.
- Preparing the discipline and profession of psychology for the future.
- Strengthening APA’s standing as an authoritative voice for psychology.

For questions or more information, please contact Pat Kobor at pkobor@apa.org

*For the purposes of this fact sheet, “animals” and “primates” refer to non-human research subjects.

- 1 2023 alzheimer’s disease facts and figures. (2023). *Alzheimer’s & Dementia*, 19(4), 1598-1695. <https://doi.org/10.1002/alz.13016>
- 2 Götz, J., Bodea, L.-G., & Goedert, M. (2018). Rodent models for alzheimer disease. *Nature Reviews Neuroscience*, 19(10), 583-598. <https://doi.org/10.1038/s41583-018-0054-8>
- 3 Neff, E. P. (2019). Animal models of alzheimer’s disease embrace diversity. *Lab Animal*, 48(9), 255-259. <https://doi.org/10.1038/s41684-019-0377-8>
- 4 Shively, C. A., Lacreuse, A., Frye, B. M., Rothwell, E. S., & Moro, M. (2021). Nonhuman primates at the intersection of aging biology, chronic disease, and health: An introduction to the American Journal of Primatology Special Issue on aging, cognitive decline, and neuropathology in Nonhuman Primates. *American Journal of Primatology*, 83(11). <https://doi.org/10.1002/ajp.23309>
- 5 Neilson, J. C., Hart, B. L., Cliff, K. D., & Ruehl, W. W. (2001). Prevalence of behavioral changes associated with age-related cognitive impairment in dogs. *Journal of the American Veterinary Medical Association*, 218(11), 1787-1791. <https://doi.org/10.2460/javma.2001.218.1787>
- 6 Lee, M. B., & Kaeblerlein, M. (2018). Translational geroscience: From invertebrate models to Companion Animal and human interventions. *Translational Medicine of Aging*, 2, 15-29. <https://doi.org/10.1016/j.tma.2018.08.002>