Columbine Health Systems
Center for Healthy Aging
COLORADO STATE UNIVERSITY

Annual REPORT

FISCAL YEAR 2024

Columbine Health Systems
Center for Healthy Aging
COLORADO STATE UNIVERSITY

Advancing

longevity, health,
and well-being through

science, education,
and community

MISSION

We unite and facilitate research teams across CSU's colleges and programs to bring convergence to the grand challenge of global aging.

VISION

We are a transdisciplinary catalyst and nationally recognized resource for the discovery and application of research on biological, cognitive, psychological, social, and behavioral factors that lead to healthy and successful aging.

What's INSIDE

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ON THE COVER: This poster, created by Ali Pierce for the CSU Center for Healthy Aging's *Look Into Your Heart: Art and Aging Exhibition* (learn more on pg. 13) was inspired by the center's research on cardiovascular disease prevention. CVD is the leading cause of mortality in the U.S. and it is currently predicted that 40% of American adults will have some form of CVD by 2030. The poster is titled "Vastacular," combining the words "vascular" and "spectacular" to attest to the positive benefits of CVD prevention methods such as aerobic exercise. In tandem with this title, Pierce depicted someone swimming in a river that replicates the intricate system of veins within humans. Pierce's poster won first in the Center's juried exhibition and was purchased for their permanent collection.

DIRECTOR

NICOLE EHRHART, V.M.D., M.S.

Columbine Health Systems
Center for Healthy Aging
COLORADO STATE UNIVERSITY

Dr. Nicole Ehrhart is the director of the Columbine Health Systems Center for Healthy Aging at Colorado State University, where she leads an interdisciplinary research effort to identify basic and translational mechanisms that promote healthy aging.

Ehrhart holds the Ross M. Wilkins, M.D. Limb Preservation Foundation University Chair in Musculoskeletal Biology and Oncology. She is a board-certified veterinary surgeon (Diplomate ACVS; ACVS Founding Fellow in Surgical Oncology), a professor of surgical oncology in the Department of Clinical Sciences in the College of Veterinary Medicine and Biomedical Sciences, and a research faculty member at CSU's Robert H. and Mary G. Flint Animal Cancer Center. In her research lab, the Laboratory of Comparative Musculoskeletal Oncology and Traumatology, Ehrhart conducts translational aging, limb preservation, tissue engineering, and sarcoma research. Ehrhart holds joint faculty positions in the School of Biomedical Engineering, the Cell and Molecular Biology program, the Gates Regenerative Medicine Center at the University of Colorado, and the University of Colorado Cancer Center.

A NOTE FROM THE DIRECTOR

Dear Friends, Supporters, and Colleagues,

I am honored to share with you the Columbine Health Systems Center for Healthy Aging's Fiscal Year 2024 Annual Report. As you explore its contents, I invite you to learn about the remarkable accomplishments, exciting growth, and deep community engagement that have defined our work over the past year.

This year, our Center has continued to push boundaries in healthy aging research, education, and outreach. We have expanded interdisciplinary collaborations, strengthened campus connections, and deepened our engagement with the broader community. Through new initiatives, impactful events, and innovative programming, we are advancing our mission to improve the quality of life for aging individuals–locally and globally.

Our success would not be possible without the unwavering support of our friends, donors, faculty, students, and partners. Your belief in our work inspires us every day to strive for excellence and innovation. Together, we are building a brighter future where healthy aging becomes a reality for all.

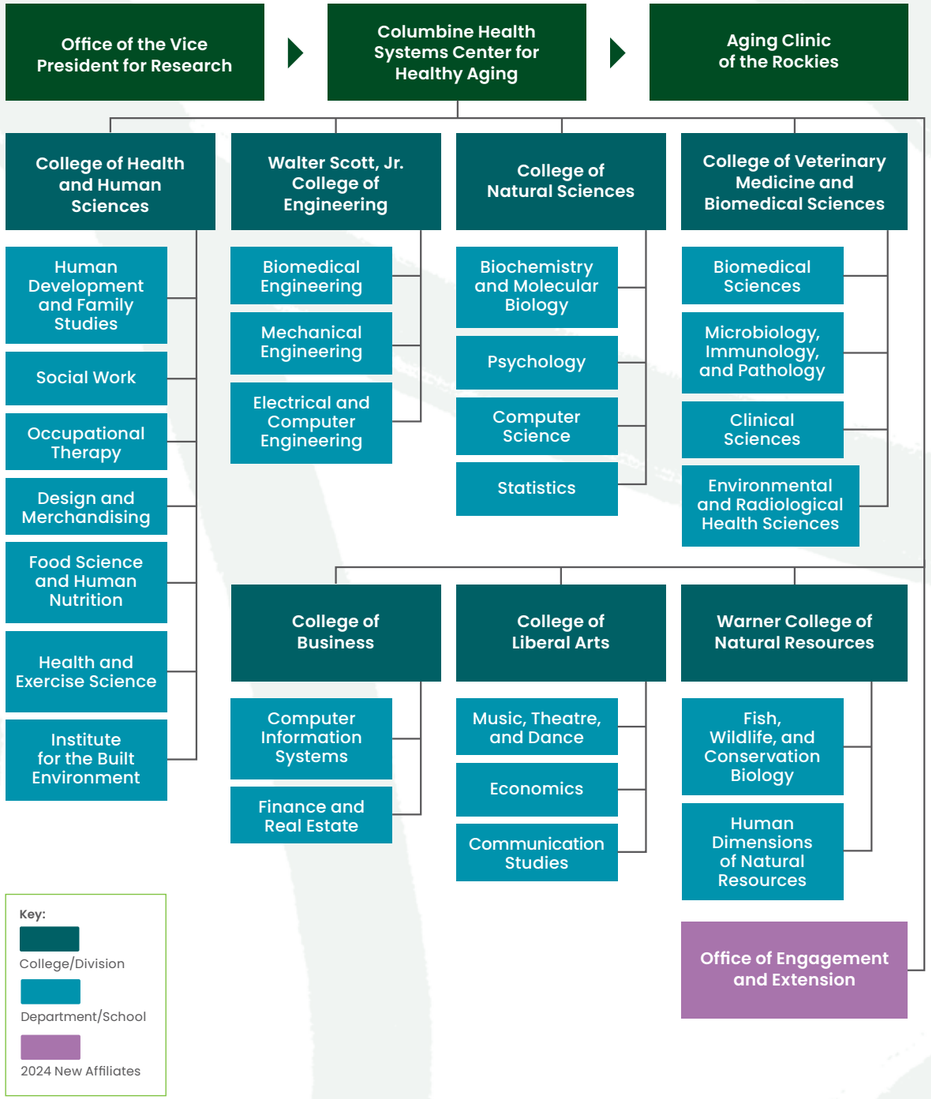
Thank you for being an essential part of our journey. We look forward to continuing this work together and achieving even greater milestones in the years to come.

With gratitude and warm regards,

ABOUT the CENTER

CENTER STRUCTURE

Currently, 90 faculty members across eight colleges/divisions and 26 departments are affiliated with the Center.



LEADERSHIP

KARYN HAMILTON, R.D., Ph.D.

Associate Director; Professor, Health and Exercise Science

Karyn L. Hamilton, R.D., Ph.D., is a professor and the director of CSU's Translational Research on Aging and Chronic Disease laboratory in the Department of Health and Exercise Science at Colorado State University. She also has the privilege of serving as an associate director of CSU's Columbine Health Systems Center for Healthy Aging. The overall objective of the TRACD laboratory is to understand the role of adaptation to stresses and maintenance of a functional mitochondrial proteome in the context of extending healthspan and maintaining function with aging. To accomplish this objective, she uses models of long life and increased healthspan, including exercise, nutritional, pharmacological, and genetic models. In the TRACD lab, they enjoy using a highly collaborative approach and employ in vitro systems, in vivo animal models, and human participants to help identify mechanisms of healthspan extension and to translate their findings.

DEANA DAVALOS, Ph.D.

Associate Director; Professor, Psychology

Deana Davalos, Ph.D., is a licensed psychologist, director of the Aging Clinic of the Rockies, associate director of the Columbine Health Systems Center for Healthy Aging, and a professor in the Cognitive Neuroscience program in the Department of Psychology at CSU. She has published on issues surrounding cognitive aging and the neurophysiology of aging and is part of a multidisciplinary research team focused on developing community-based interventions for individuals with dementia-related diseases and their caregivers.

TOM LAROCCA, Ph.D.

Center Faculty Member; Assistant Professor, Health and Exercise Science

Tom LaRocca, Ph.D., is an assistant professor and director of the Healthspan Biology Lab in CSU's Department of Health and Exercise Science. He is also a faculty member at the Center for Healthy Aging. His laboratory studies the molecular biology and physiology of aging, and he is particularly interested in translational research (using laboratory science to develop practical applications or treatments that can help people). Current projects are focused on finding biology-based ways to increase healthspan, the period of life during which we are healthy and productive. LaRocca is also a former high school chemistry teacher and college instructor, so he enjoys bringing his interests into the classroom.

NICCOLE NELSON, Ph.D.

Center Faculty Member; Assistant Professorm Psychology

Niccole Nelson is an assistant professor in the Department of Psychology at Colorado State University. A lifespan developmental psychologist by training, she aims to identify biological, psychological, and social resources that help individuals thrive through older adulthood. She is particularly interested in the ways in which modifiable, short-term experiences such as stress and emotion regulation relate to longer-term, developmental trajectories of cognitive ability, psychological well-being, and physical functioning. Nelson holds a Ph.D. in research and experimental psychology from the University of Notre Dame. She brings valuable experience as a former postdoctoral associate in UND's Adult Development and Aging Lab and is excited to engage in interdisciplinary collaborations and community outreach as a Center faculty member.

STAFF

ALI MURPHY

Administrative Assistant

Allison Murphy, or Ali as she likes to be called, is the administrative assistant at the Center for Healthy Aging. She recently moved to Fort Collins from northern Virginia where she worked for a law firm specializing in special needs trusts, estates, and adult guardianship. Murphy is excited to facilitate faculty in all aspects of Center engagement and to be the friendly face you see when walking into the Center between 8 a.m. and 5 p.m. Please contact Murphy for help with directing clinical trials' participants, room reservations, website update requests, office needs, mailing, Center AV issues, scheduling, and events planning.

ANNETTE FOSTER, CPA

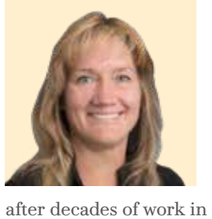
Business Operations and Research Administration Manager

Annette Foster joined the Columbine Health Systems Center for Healthy Aging in late January 2020 as the business operations and research administration manager. She plays a vital role in helping to facilitate grant submissions, post-award support, and overall operations of the Center's facilities and is providing invaluable leadership and vision during CHA's growth phase. Foster is a graduate of Colorado State University's College of Business, a CPA, and a former financial auditor and sole proprietor. Prior to joining the Center for Healthy Aging team, she served as a research project manager for CSU's Department of Atmospheric Science. She brings her extensive experience from these various roles to contribute to the success of the Center.

HANNAH HALUSKER

Communications Lead

As the communications lead, Hannah Halusker develops multimedia communications and plans outreach events to help amplify the research and programming offered by the Center for Healthy Aging. She comes to the Center from South Carolina, where she received her B.S. in genetics (2017) and M.A. in communication, technology, and society (2020) from Clemson University. At Clemson, Halusker served as a science writer in the College of Science and then as the director for a science and arts festival in nearby Greenville, South Carolina. She is thrilled to bring her passions for science communication and engagement to her role at the Center.



LAURA THORNES

Assistant Director of Development

Laura Thornes comes to the Center for Healthy Aging as part of the Vice President for Research Advancement team. Her focus is on raising funds for the Center through philanthropic giving. She is passionate about furthering important research and learning, which benefit individuals and communities and have a global impact. She comes to this role after decades of work in international education and 10 years as CSU's director of Education Abroad. She received her bachelor's in secondary education with German and Spanish from the University of Arizona and master's in educational psychology from Northern Arizona University.

NATHAN LARSON

Bioarchivist

Nathan Larson joined the Columbine Health Systems Center for Healthy Aging at the start of Fall 2023 to work as the Center's bioarchivist. In this role, Larson is responsible for managing the Center for Healthy Aging's Longitudinal COVID-19 biobank. This valuable and unique asset is helping researchers learn how respiratory viruses spread within senior living communities thereby providing vital information that will help in future outbreaks. Before this role, Larson obtained his B.S. in biological science from Colorado State University with a concentration in pre-health studies. During undergrad, he worked at CSU's Veterinary Diagnostic Laboratories as a necropsy hourly, working with pathologists in their diagnosis and study of diseases.

STUDENT AMBASSADORS

The Center's newly developed student ambassador program aims to enhance CHA's connection to the University and broader Fort Collins community, supporting on-campus partnerships and those with local organizations serving older adults. The program was launched in Summer 2023 with the goal of strengthening CHA's tie to CSU's undergraduate student population and the College of Health and Human Sciences' Gerontology Club.

RACHEL WASHBURN

Major: Health and Exercise Science; Minor: Gerontology

Rachel Washburn is president of the CSU Gerontology Club and serves as a student ambassador at the Center for Healthy Aging. In these roles, Washburn coordinates opportunities for students to learn more about aging and working with older adults. She also collaborates with the Fort Collins Senior Center to teach a technology class designed for older adults. Washburn is majoring in health and exercise science with a minor in gerontology. After graduating, she plans to pursue a degree in occupational therapy.

BROOKE ZARECKI

Major: Biomedical Sciences; Minor: Spanish

Brooke Zarecki is a senior at Colorado State University, majoring in biomedical sciences with a minor in Spanish. Her future goals are to become a physician's assistant. As a Center for Healthy Aging Student Ambassador, Zarecki works to engage students at CSU with the aging community. With an interest in health care, she is determined to provide resources for older adults and opportunities for her peers. She is also the vice president of the Gerontology Club, where she sets up meetings and volunteer events and identifies opportunities for intergenerational connections between older adults and the CSU community.

STUDENT AMBASSADOR PROGRAM

In FY 24, the Center continued it's highly successful student ambassador program in partnership with Assosciate Professor Allyson Brothers from the Department of Human Development and Family Studies, who also advises CSU's undergraduate Gerontology Club. The ambassador program strengthens CHA's connections across CSU and the Fort Collins community, supporting partnerships with campus groups and local organizations that serve older adults, while fostering closer ties with CSU's undergraduate population. The first of these ambassadors were Rachel Washburn and Brooke Zarecki, co-Presidents of the Gerontology Club.

As CHA's inaugural ambassadors, Washburn and Zarecki developed the Center's "Careers in Aging" materials, including flyers and slide decks illustrating how various CSU majors lead to careers in healthy aging. They enhanced the Center's aging blog content, contributed ideas for new programming, represented CHA at community events, and provided extensive communications and events support to Communications Lead Hannah Halusker. The FY24 launch of CHA's Tech Skills for Older Adults class and online resource was a direct result of Washburn's contributions as an ambassador, with Zarecki assisting by translating written technology guides into Spanish. Washburn and Zarecki's leading contributions to this new program will continue to impact our community for years to come.

Photo from Gerontology Club

ENGAGEMENT

COMMUNITY AND CIVIC ENGAGEMENT

Government Relations Faculty Ambassadors Initiative

Nicole Ehrhart; Jennifer Barfield; Chris Funk; Peter Harris; Caroline Havrilla; Kelly Martin; Nathaniel Riggs

CHA Director Nicole Ehrhart participated in the prestigious Government Relations Faculty Ambassadors Initiative, a two-year program hosted by CSU's Office of the Vice President for Research. As one of only seven faculty members selected, Dr. Ehrhart engaged in specialized training to bridge the gap between science and policy. The initiative prepares faculty to serve as expert resources for lawmakers, effectively communicate research findings, and advocate for evidence-based policies that impact communities on a state and national level.

"I am deeply committed to ensuring that science serves as the foundation for policies and programs that address the critical challenges of an aging population," Ehrhart emphasized. "By fostering meaningful partnerships between academic leaders and policymakers, we can drive transformative research, secure vital funding, and shape a future where our University leads in advancing aging-related education, advocacy, and innovation."

Speaking Engagements

As director, Ehrhart is the Center's key spokesperson, responsible for growing its local, regional, and national presence in healthy aging research, industry, and services. Below is a sampling of speaking opportunities she completed in FY24:

The Emperor of All Maladies: Intersecting Cancer and Aging

Women in Science Symposium

March 6, 2024

Colorado State University

Great Danes & Granddads: How the Companion Dog is Moving the Needle in Longevity Interventions

CAN Summit Meeting

April 12, 2024

Lake Geneva, Switzerland

Addressing Musculoskeletal Disease Through Targeting Fundamental Drivers of Aging

Vail Scientific Summit

June 30, 2024

Vail, Colorado

Interested in attending one of the Center's healthy aging events? Contact Ali Murphy at Ali.Murphy@colostate.edu.

EVENTS

Look Into Your Heart: Art and Aging Exhibition

In Jan. 2024, the Center hosted Look into Your Heart: An Art and Aging Exhibition, featuring artwork by students in Assistant Professor Roberto Muntoreanu's Fall 2023 Advanced Typography and Design class. These students created poster zines (short magazines that fold out into a poster) inspired by interviews with CHA researchers and local older adults and covering topics such as cognitive health, cardiovascular health, behavioral aging studies, advice for healthy aging, life trajectories, and personal experiences with the aging process. Students were able to exhibit their zines and the top three were purchased by the Center for permanent display. The top four posters are displayed throughout the annual report; page numbers and designers are listed below.

Photo from the Look Into Your Heart: Art and Aging Exhibition

1st place: Ali Pierce, depicting Dr. Tom LaRocca's research (cover).

2nd place: Grace Carter, depicting Lisa Morgan's Moving Through Parkinson's program (page 25).

3rd place: Peyton Anderson, depicting Dr. Christine Fruhauf's research (page 32).

4th place: Emma Sherrets, depicting Dr. Deana Davalos's research (page 43).

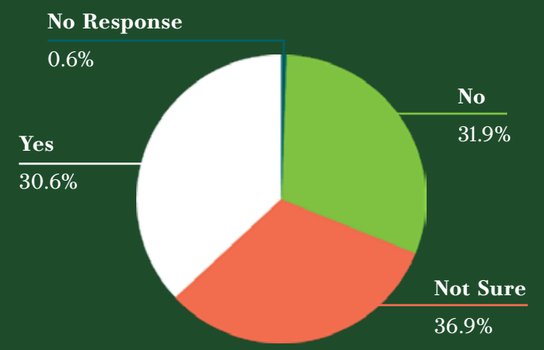
SHOULD THERE BE AGE LIMITS FOR POLITICIANS?

How old is too old to run for elected office? Why does the United States have one of the oldest Congresses among industrialized nations? Is it time for younger representatives and fresh perspectives in government?

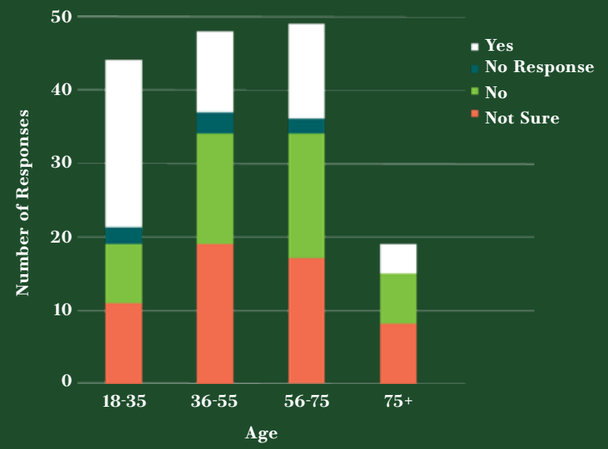
CSU's Center for Healthy Aging hosted a panel discussion on the topic on President's day—February 19. 2024—to delve into this topic.

PUBLIC OPINION BASED ON 161 SURVEY RESPONSES

In your opinion, should there be a maximum age limit for individuals running for the presidency or other high-level political offices?



Should people running for elected positions have to take a cognitive test, and should their results be shared with the public?



Columbine Health Systems Center for Healthy Aging
COLORADO STATE UNIVERSITY

CSU | YEAR OF DEMOCRACY

SCAN FOR FULL STUDY RESULTS ›

Tour Tuesdays

Tour Tuesdays returned to the Center for Healthy Aging in Fall 2023 and Summer 2024. These tours offered a behind the scenes look at the Center, showcasing CSU's aging initiatives and the wide range of programs and services offered at the Center for Healthy Aging, to CSU faculty and students as well as the greater community.

Garage Talks

The CHA's Garage Talks series delved into the "garage of your minds" to explore exciting research ideas. From those who had projects they were working on where feedback was desired to those who had ideas but were unsure about potential grant mechanisms or experimental designs, this mixer provided a collaborative, laid-back setting to workshop ideas and receive input from peers.

Some topics that were discussed included:

Exploring faculty's interest in an Interventions Testing Program involving dogs, and the role CHA could play in championing such an initiative.

Reimagining graduate student training in an inter/transdisciplinary environment.

Aspen Club Events

In the fall of 2023, the Center for Healthy Aging proudly partnered with UCHealth's Aspen Club to enrich the lives of adults over 50 in Larimer County. For more than 35 years, Aspen Club has been a trusted resource, offering health-related programs and services designed to empower older adults to age healthfully and maintain their independence.

This partnership has been a game-changer, enabling Aspen Club to tap into Colorado State University's cutting-edge expertise in healthy aging. At the same time, it provides the Center for Healthy Aging's faculty and students a unique opportunity to share groundbreaking research with the community.

The three talks detailed below sparked meaningful conversations on topics ranging from the effects of aging on motor coordination to the critical role of sleep in maintaining metabolic health.

Looking ahead, we are thrilled to continue partnering with Aspen Club to bring even more valuable resources to our community. In the coming months, the Center will host bi-monthly balance screenings and a diverse lineup of talks led by experts. Topics will include sleep management, medications and supplements, caregiver stress management, and much more.

We invite you to explore these opportunities and join us in fostering a community dedicated to healthy aging. Visit our website for details on upcoming events, locations, and registration.

Age-related decline in bimanual dexterity: Looking beyond the role of motor functions

Presenter: Prakruti Patel

The ability to use both hands simultaneously in skilled, bimanual tasks, such as tying shoe laces or buttoning a shirt, is crucial for independent living. Age-related decline in bimanual dexterity is well-known. Presented by Prakruti Patel, a postdoctoral researcher in CSU's Movement Neuroscience and Rehabilitation Laboratory, this talk focused on whether decline in bimanual dexterity is related to motor functions, such as grip strength and force accuracy, and/or cognitive functions, such as attention and processing speed.

www.research.colostate.edu/healthyagingcenter/events

Aspen Club Events Continued

Viral infections and Parkinson's disease: What are the risks?

Presenter: Ron Tjalkens

Most cases of Parkinson's disease (PD) have no known origin. However, age, genetics and environmental factors all play a role in determining whether an individual will develop this neurodegenerative disorder. Viral infections, especially those that infect neural tissues such as COVID-19 can negatively impact the brain and serve as a potential risk factor for PD and other neurodegenerative disorders. This has raised many questions about the potential long-term effects of such infections. Ron Tjalkens, a professor of toxicology at CSU, discussed how viral infections can impact brain function related to PD and highlighted why the immune system may be the balance point between protection and disease.

Photo from Sophie Seward's Presentation

Sleep and circadian disruption impair cardiometabolic health

Presenter: Sophie Seward

Sleep and circadian disruption is highly prevalent in the United States and is associated with heightened risk for Type 2 diabetes and cardiovascular disease. Limited strategies or countermeasures exist to prevent the impact of sleep and circadian disruption on these health conditions. Sophie Seward, a third-year Ph.D. candidate in the CSU Sleep and Metabolism Laboratory, guided participants in understanding how sleep and circadian disruption impair metabolism and whether improving timing of sleep and eating can improve health.

Columbine-CHA Health Fair
Windsor, CO.

The Center for Healthy Aging partnered with Columbine Health Systems to host a vibrant Health Fair for the residents of Windsor Independent Living. This collaboration brought together CSU's leading aging researchers, Columbine staff, and community partners to create a day dedicated to wellness, education, and empowerment for older adults.

The event featured a variety of interactive booths offering valuable services and resources:

Walker Maintenance and Repair: Ensuring residents' mobility aids were in top condition.

Flu Shots and Vision Tests: Promoting preventative care for optimal health.

Balance and Mobility Testing: Led by CSU's research faculty and students in the Department of Health and Exercise Science and Occupational Therapy faculty, participants had balance assessments and were provided insights into fall prevention and stability improvement.

Cognitive Health Screenings: Offered by the Aging Clinic of the Rockies and Brain Health Center of the Rockies, providing critical resources on cognitive decline.

Center for Healthy Aging Outreach: Sharing information on our latest research, projects, and opportunities to join our research registry.

The Health Fair drew dozens of enthusiastic participants, who engaged with screenings and services designed to support their well-being. Residents left equipped with actionable insights about their health and practical steps to maintain it, while our team cherished the chance to connect directly with the community, share our mission, and showcase the impactful work happening at the Center.

We are proud to collaborate with partners like Columbine Health Systems to bring meaningful, hands-on opportunities to older adults in our community. Together, we're fostering a healthier future for all.

Photo from Columbine-CHA Health Fair

Photo from Columbine-CHA Health Fair

ACoR

The Aging Clinic of the Rockies (ACoR) is a non-profit organization established for the purpose of helping older adults and their families adjust to challenges that come with aging. The mission is to improve the quality of life for older adults and their loved ones, through the promotion of dignity and overall well-being. The Center takes a holistic approach to Client-Centered Care that includes counseling services that are tailored to meet each individual's needs.

During the past year, the Center has offered services focusing on the Caregiver Support Program, Counseling Program and Neuropsychological Assessment services. The Center's Caregiver Support Program is funded through a grant from Larimer County Office on Aging which offers free or donation-supported caregiver counseling sessions to caregivers in Larimer County. Topics generally include coping skills, education, connecting to community resources, help making decisions, addressing self-care, and finding support. The Center's Counseling Program addresses a variety of issues, including life changes, relationships, depression, anxiety, age-related concerns (like coping with pain or cognitive decline), feeling lonely or isolated, and end-of-life concerns. These therapy services are offered to community members on an affordable sliding fee scale based on their gross annual family income and the number of dependents in their family. Last, the Center's Neuropsychological Assessment services evaluate an individual's functioning across a variety of different domains including cognitive, memory, language, motor, executive, emotional, and adaptive functioning. These assessments help to evaluate if there is a problem, the extent of the problem, potential causes of the problem, and to inform individualized treatment recommendations based on results. These assessment services are offered to community members on an affordable sliding fee scale.

The sliding scale services provided by ACoR are in line with the university's mission to provide public service and promote civic responsibility. In addition, ACoR serves an important role within the university, specifically the Counseling Psychology program in the Department of Psychology by providing supervised training of individuals interested in geropsychology.

HEALTHY AGING SPEAKER SERIES

This series spotlights a different CHA research area each semester, featuring guest lecturers from across the country for an invited lecture, campus tour, and social experience with CSU faculty and students. In its face-to-face format, the goal of the series is to bring renowned aging researchers to CSU, foster collaboration among institutions, and raise the profile of CSU's own aging research.

OCTOBER 2023

Genes, Environment and Health. Most cases of Parkinson's disease are sporadic (not hereditary) and involve interactions of age, genetics and environmental exposures. Heavy metals are one class of environmental agents to which everyone is exposed – and manganese, in particular, causes a PD-like disorder in high doses. It has been recognized since the 1850s that essential metal manganese induces these Parkinson-like motor deficits, but remarkably, the first hereditary disorder of manganese neurotoxicity (due to mutations in the SLC30A10 gene) was only identified in 2012.

Mukhopadhyay's presentation focused on functional and mechanistic studies of SLC30A10 performed over the last decade that have transformed scientists' understanding of manganese homeostasis and its induced neuromotor disease. Understanding how this environmental agent is linked to long-term changes in the brain is highly relevant to understanding general mechanisms by which genetics and environment interact to promote neurological disease.

MAY 2024

Nature, Aging and Virtual Reality. Sharde Johnson, lab manager for Assistant Professor Sara LoTemplio's RAAIN Lab, delivered a research presentation at the Center discussing the use of nature as a strategy to promote cognitive performance, recovery from stress, and mood. This research collaboration was led by LoTemplio, CHA Associate Director Deana Davalos, and Assistant Professor Francisco Ortega. For further details about the project, read this feature over on SOURCE.

The global population of adults ages 65 and older is growing faster than in the past. Considering that this demographic faces an increased risk of developing Alzheimer's disease and related dementias (ADRD), the prevalence of ADRD is also likely to increase as the number of older adults grows. Without the existence of a cure, varied and creative interventions need to continue to be developed and tested. In this presentation, Johnson discussed a recent study by researchers at Colorado State University and collaborating universities that examined the effects of real-world and virtual reality nature on older and younger adults' cognition, stress, and mood. Results offer insights about using nature-based interventions to support health and well-being.

CHA comms lead, Hannah Halusker, records an episode with Assistant Professor Stephen Aichele.

PODCAST CORNER: Season 4 of *living healthy longer* premiered in March 2024. Twelve episodes were released every other week. To stay updated, listeners can subscribe on various podcast platforms including Apple Podcasts, Spotify, or Amazon Music. Learn more about the podcast on SOURCE: **col.st/7yk1k**.

Podcast Analytics

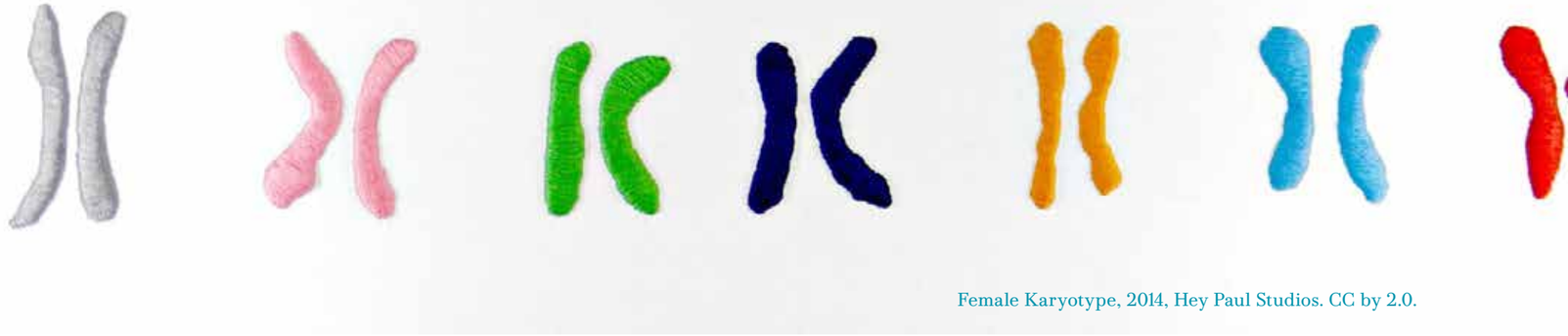
TOP EPISODES (July 2023 – June 2024)

GUEST	EPISODE TITLE	PUBLISHED DATE	# PLAYS
Season 3, All Guests	Challenges to Advancing Aging Research: Season 3 Finale	07/11/23	249
Ava Segal, Founder and CEO of Steadi Systems	Balance Fitness for Longer Healthspan	5/22/23	105
Kate E. Creevy, Professor at Texas A&M University and Chief Veterinary Officer of The Dog Aging Project	The Dog Aging Project	6/19/23	94
Greg Gahm, Associate Professor at CU Anschutz and Corporate Medical Director for Vivage Senior Living	Shifting Dynamics of Long-Term Care	4/1/24	89
Karrin Anderson, Moderator and Professor of Communication Studies; Manfred Diehl, University Distinguished Professor of Human Development and Family Studies; Christine Fruhauf, Professor of Human Development and Family Studies; Lucas Brady Woods, State Capitol Reporter at KUNC; Nick DeSalvo, ASCSU President and Political Science student.	Should There Be Age Limits for Politicians? A Panel Discussion	3/13/24	77

living healthy longer analytics as of 6/30/24: **TOTAL DOWNLOADS: 8,921** *(23.1% increase from prior year)*

BLOG

Why Do Females Tend To Outlive Males



Female Karyotype, 2014, Hey Paul Studios. CC by 2.0.

by Brooke Zarecki

Across both the human world and the animal kingdom, research consistently shows that, on average, females tend to outlive males. This widely observed phenomenon could offer valuable insights into the mechanisms of aging, though scientists still don't fully understand why these differences exist. Experts think factors, such as vulnerability to environmental hazards (like air pollution, tobacco smoke, pesticides), patterns of parental care, the intensity of sexual selection, hormone variations, and the way chromosomes pass from parent to child might all play a part.

While almost all studied animal species have differences in how long males and females live, these differences are largely conditional and will change depending on what's happening around them. Humans are the only species where women almost always live longer than men. However, because women tend to live longer, they are more likely to get sicker, especially in later life.

GENETIC EXPLANATIONS

In genetic terms, most females have two X chromosomes, and most males have one X and one Y chromosome. X chromosomes contain hundreds of protein-encoding genes, which are essential for life and performing various functions in the body. In contrast, Y chromosomes carry fewer protein-coding genes, primarily focused on male sex determination and development. Among these is the SRY gene, responsible for triggering the development of testes, which produce male reproductive cells and the hormone testosterone. Other genes on the Y chromosome play vital roles in male fertility, enabling men to father biological children.

A study conducted in 2018 used genetic manipulation to generate XX and XY mice, with either testes or ovaries: the reproductive glands where the egg forms and the hormones estrogen and progesterone are produced. Their findings showed that mice with both XX chromosomes, regardless of their reproductive organs, had a normal lifespan and were less likely to succumb to early death. However, if the mice had both XX chromosomes and ovaries, they experienced extended life and outlived other mice in the study. This result implies that both genetic makeup and hormonal profile play an important role in longevity. Additionally, researchers have noticed that it is beneficial to have two X chromosomes because if one X chromosome becomes damaged, the other can take over – a process known as X-inactivation – potentially contributing to better aging outcomes.

HUMANS' EXCLUSIVITY

Humans are unique in the abundance of data showing that women generally live longer than men. This survival advantage for females is evident across all stages of life, from birth and maybe even slightly before. Understanding the mechanisms driving this early survival trend could offer insights into lifelong differences between the sexes.

However, as previously mentioned, females are more likely than men to suffer health limitations later in life due to their extended lifespans. This is a phenomenon known as the morbidity-mortality complex, and as of now, humans are the only species in which this phenomenon is observed.

Science has proposed several explanations for this paradox. One hypothesis is that because men die at higher rates than women throughout life, the men who survive are more likely to have superior physical health that allows them to live longer (essentially, survival of the fittest.) This could explain conditions like heart disease, where men die at a higher age-adjusted rate from the disease compared to women (mortality), but women experience higher rates of disease (morbidity).

Another explanation focuses on health issues prevalent in the later life of humans. For example, women are more prone to severe joint and bone problems, such as osteoarthritis, osteoporosis, and idiopathic back pain compared to men.

These hypotheses suggest that while men may be physically stronger and report fewer diseases, women often have more disabling conditions, highlighting the complexity of sex differences in health and function across diverse populations and age groups.

SEX-SPECIFIC LONGEVITY IN ANIMALS

In the animal kingdom, many species exhibit female-biased lifespans and slower aging, but the longevity differences are more complicated, and exceptions do exist. For example, American beavers have similar lifespans regardless of sex, and in some bat species, males live longer than females.

Studies like "Sex-specific aging in animals: Perspective and future directions" and "Sex Differences in Lifespan" have highlighted that these differences often depend on various factors, such as diet changes, reproductive status, stress levels, and environmental conditions. Increased survival and extended lifespan in females may be impacted by evolutionary pressures that enhance their ability to care for offspring and ensure reproductive success. Alternatively, shorter male lifespans might benefit future generations by reducing competition for resources and mates.

Environmental factors significantly influence lifespan differences between sexes. For instance, hotter environments can reduce male fertility in mammals, prompting males to prioritize reproduction over maintaining bodily functions, which accelerates aging compared to females. And, male competition in many species often leads to higher risks of injury or death, again resulting in shorter lifespans for males.

In conclusion, investigating sex differences in lifespan offers important insights into how genetics, physiology, and the environment interact to shape longevity across species. By unraveling these complexities, we can enhance our understanding of aging processes and potentially develop strategies to promote healthy aging and longevity in both humans and animals.

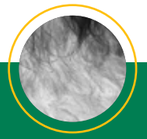
WEBSITE TRAFFIC

TOP WEBPAGES from July 2023 – June 2024

186,024
TOTAL PAGE VIEWS
62% increase from previous year

24,588 VIEWS
How to Rewire Your Brain

22,331 VIEWS
Body Temperature



23,319 VIEWS
The Science of Gray Hair

POPULAR POSTS FROM JULY 2023 - JUNE 2024

SOCIAL MEDIA @CSUHealthyAging

251%
REACH INCREASE
from previous year

MAY 30, 2024
Summer Tour Tuesdays Post

JUNE 20, 2024
Post about Grace Borlee's podcast episode about intergenerational learning

JUNE 5, 2024
Aga Burzynska's "Myelin and Memory" podcast promotion

JUNE 20, 2024
Post about Grace Borlee's podcast episode about intergenerational learning

DECEMBER 8, 2023
Ray Miller SOURCE article about economic inequality

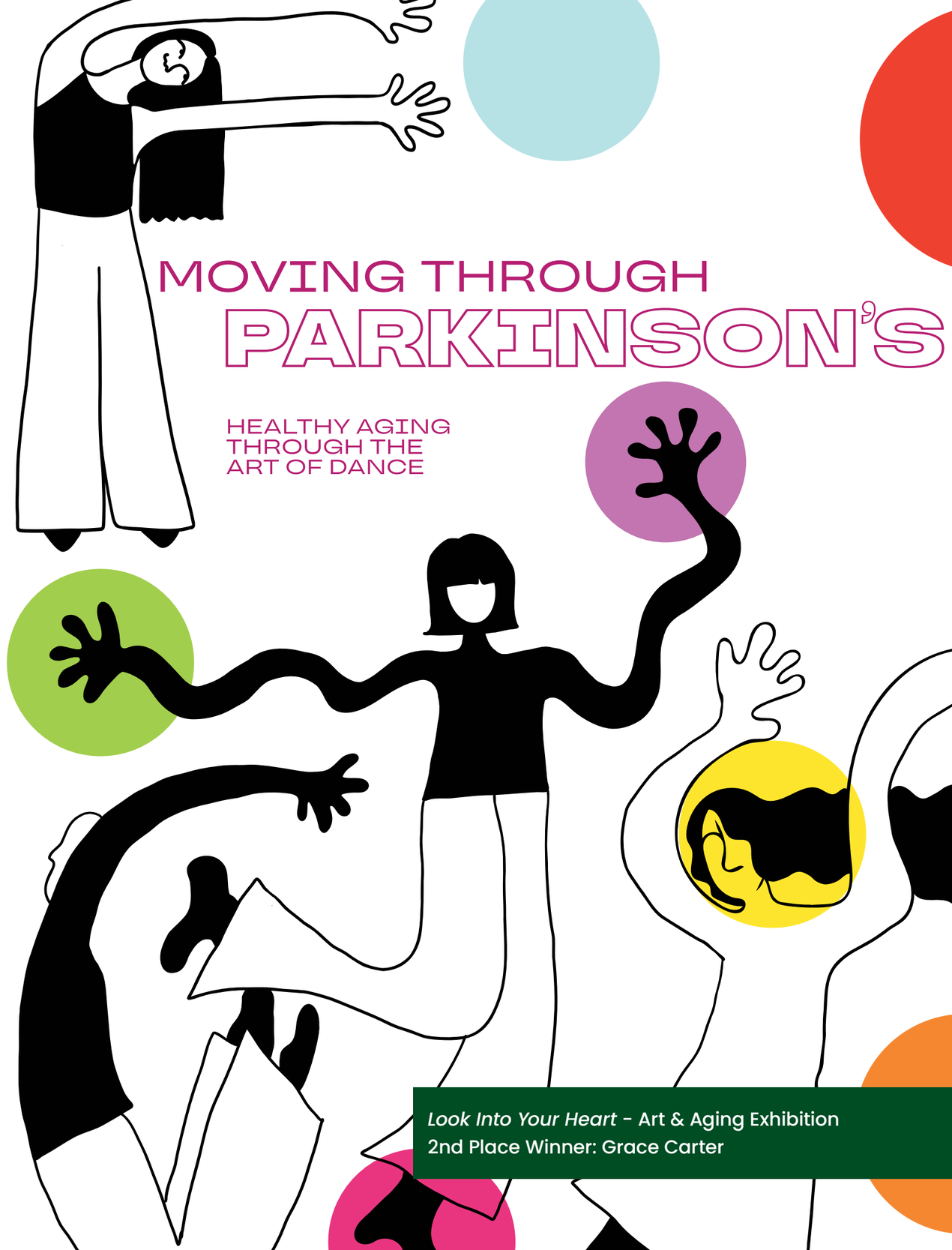
SEPTEMBER 2023
Meara Faw & Michelle Matter's publication about dementia care partners

JUNE 2024
Post about Grace Borlee's podcast episode about intergenerational learning

NOVEMBER 2023
Recapping the Columbine/CHA Health Fair in Windsor

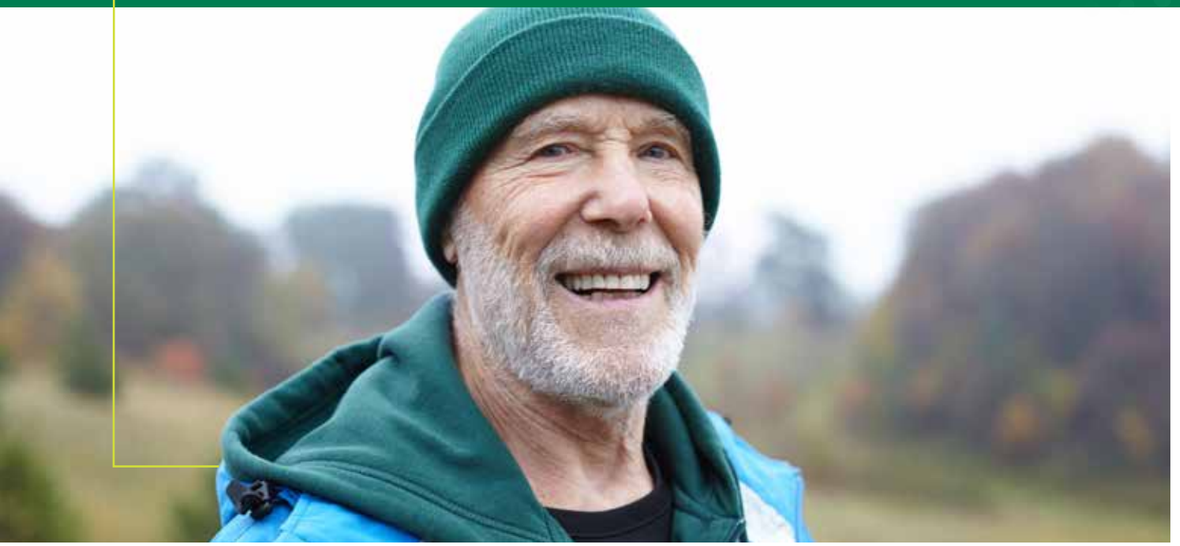
MOVING THROUGH PARKINSON'S

HEALTHY AGING THROUGH THE ART OF DANCE



Look Into Your Heart - Art & Aging Exhibition
2nd Place Winner: Grace Carter

EDUCATION



CERTIFICATE PROGRAM

Transitions in Aging Community Certificate

The Transitions in Aging Certificate Program has attracted community members, students and informal care providers of older adults who are interested in learning more about healthy aging topics. The certificate aims to build shared knowledge of the aging process: myths and misconceptions about aging, experiences of older people and caregivers, and common age-related diseases and conditions. And, it encourages participants to engage in lifestyle practices that support healthy aging. The certificate's modules incorporate a mix of CHA original content (blogs, SOURCE articles, podcasts, webinars, research participation opportunities) and programming from local community partners, such as the Alzheimer's Association of Colorado, Senior Access Points of Larimer County, Fort Collins Senior Center, and more.

The Transitions in Aging Community Certificate is one forward step in the Center's goal to introduce various educational programs. Ongoing discussions involve the development of additional tracks centered around topics of aging in rural locations, interdisciplinary aging studies, and student-to-clinical professional trainings. The program is customizable for each participant and is offered at little to no cost.

THE GRADUATE STUDENTS OF HEALTHY AGING

The Center has 90 faculty affiliates across eight colleges/divisions and 26 departments, which equates to lots of graduate students who are directly or indirectly associated with the Center. Below is a Q&A with a few of these students.

KATE WILLIAMS

DVM/Ph.D. Candidate in Clinical Sciences

ADVISERS:
Nicole Ehrhart
Karyn Hamilton

What is your research focus?

I am a dual DVM/PhD student in Nicole Ehrhart's Laboratory, and my PhD research investigates strategies to improve skeletal muscle regeneration. As we age, our muscles lose their ability to repair themselves. This contributes to frailty, prolonged recovery after surgery or injury, and muscle weakness contributing to risk of future injury. My research investigates how mechanical forces, such as those experienced during exercise, affect small particles called extracellular vesicles (EVs) that are released by muscle cells. My work suggests that EVs produced by muscle cells under mechanical strain alter the function and growth of other muscle cells that take up the EVs. Therefore, EVs produced by muscle cells are promising candidates as a therapeutic to target age-related muscle decline in regenerative capacity.

What are your career goals?

I want to become an academic professor and veterinary clinical pathologist leading a research lab focused on regenerative medicine and healthy aging. By combining my passion for translational research and teaching, I hope to develop novel regenerative therapeutics that improve the health and quality of life for both animals and humans.

How has being affiliated with CSU's Center for Healthy Aging helped your research?

My affiliation with CSU's Center for Healthy Aging has allowed me to broaden my research interests by collaborating with researchers who study diverse aspects of healthy aging. I have had many opportunities to network with other professors associated with the CHA who have provided valuable insight into my PhD research. My graduate committee mainly consists of researchers affiliated with the CHA who have helped guide my research over the past several years.

SYDNEY RISEN

Ph.D. Candidate in Toxicology

ADVISER:
Julie Moreno

What is your research focus?

My research aims to unravel the mechanisms driving neurodegenerative disease progression, with a focus on identifying therapeutic targets and evaluating the efficacy of novel drug candidates. My recent work involves investigating glial cells—critical support cells in the brain—in canine cognitive dysfunction, a naturally occurring model that closely parallels human neurodegenerative diseases. By examining the cellular and molecular changes associated with this condition, I strive to enhance our understanding of disease processes and their broader implications. My motivation lies in addressing the urgent need for earlier diagnosis and more effective treatments for neurodegenerative diseases, which have profound impacts on patients and their families. Through the unique insights provided by comparative models, my goal is to translate these findings into impactful therapies that improve quality of life for both humans and animals.

What are your career goals?

My career agoal is to become a Medical Science Liaison in the area of neurodegenerative disease treatments. Through my research on disease mechanisms, therapeutic targets, and drug efficacy, I have developed a strong foundation in translating scientific discoveries into actionable insights. As an MSL, I aim to act as a key communicator between researchers, healthcare providers, and pharmaceutical teams, ensuring that scientific innovations are translated into effective patient care. I am deeply motivated by the opportunity to contribute to advancing therapies that address the profound challenges posed by neurodegenerative diseases, improving not only outcomes but also quality of life for patients and their families. My vision is to be a trusted resource and advocate in this field, working to bridge the gap between discovery and treatment delivery.

How has being affiliated with CSU's Center for Healthy Aging helped your research?

Being affiliated with CSU's Center for Healthy Aging has been instrumental in advancing my research. The Center's interdisciplinary approach has connected me with investigators across campus, fostering collaborations that have enriched my work on neurodegenerative diseases. These partnerships have allowed me to integrate diverse perspectives and methodologies, enhancing the depth and scope of my studies. Additionally, the Center's focus on evidence-based outreach and education has provided a broader context for my research, helping me consider how biological, cognitive, and behavioral factors influence aging and disease progression. This affiliation has not only supported my specific research goals but also encouraged me to approach my work with a more holistic and community-focused mindset, aligning my efforts with broader initiatives in healthy and successful aging.

RANDY GRANT

Ph.D. Candidate in Human Bioenergetics

ADVISER:
Thomas LaRocca

What is your research focus?

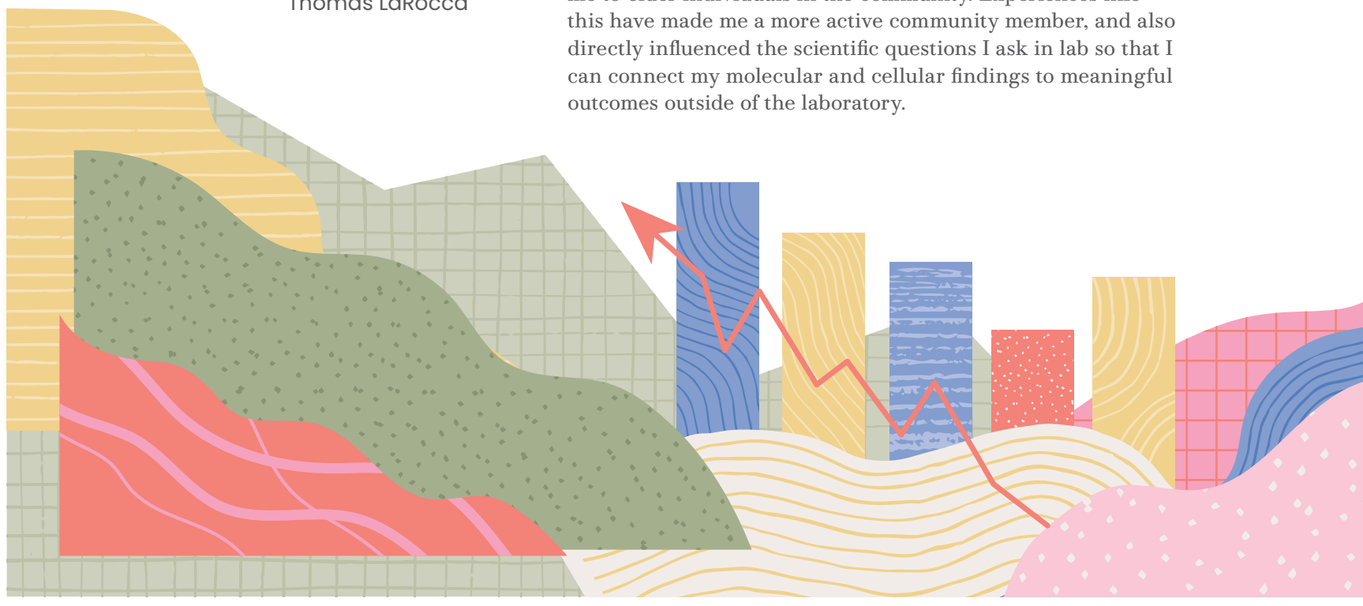
My research focuses on the biological mechanisms that underlie brain aging and neurodegenerative diseases like Alzheimer's disease. Specifically, I use translational research approaches (different "models" like cells, mice and human samples) in conjunction with bioinformatics (high-performance computer analyses) to better understand how aging impacts the regulation of genes in the brain to predispose individuals to neurodegeneration and disease.

What are your career goals?

My career goal is to become an independent investigator focused on understanding the dynamic events occurring in the genome of immune cells in the context of brain aging and Alzheimer's disease. Ultimately, I hope to contribute to the development of novel therapeutics that improve the quality of life for individuals affected by disease while minimizing the burden it puts on our healthcare system and society.

How has being affiliated with CSU's Center for Healthy Aging helped your research?

Being a part of CSU's Center for Healthy Aging has significantly enhanced the impact my research has on our community. For example, writing articles for the Center's blog has allowed me to communicate my research to a wider audience and has connected me to older individuals in the community. Experiences like this have made me a more active community member, and also directly influenced the scientific questions I ask in lab so that I can connect my molecular and cellular findings to meaningful outcomes outside of the laboratory.



TECH SKILLS FOR OLDER ADULTS

In an increasingly digital world, personal devices like smartphones and tablets have become essential for communication, information access, financial management, and entertainment. However, older adults often struggle with the rapidly evolving technology, frequently turning to family members for help – a process that, according to a 2019 study by CSU's Christine Fruhauf and CU Denver's Jennifer Dickman Portz and colleagues – can lead to frustration on both sides.

Recognizing this challenge, former Center for Healthy Aging Student Ambassador Rachel Washburn launched a technology education initiative, called 'Tech Skills for Older Adults,' that returned in-person this fall at CSU's Center for Healthy Aging. In partnership with the Osher Lifelong Learning Institute, the program offered a weekly series of classes covering: Smartphone Accessibility, Texting with Smartphones, Clipping Coupons with the King Soopers App, Facebook Marketplace on the Facebook App, Kanopy App, and the New York Times Games App.

This series built on the success of an earlier version of the program, which Washburn first introduced at the Fort Collins Senior Center in February 2023.

The program, then titled 'Explore & Learn: Tech Skills for Older Adults,' offered an encouraging environment where seniors could gain confidence using smartphone apps, with guidance from student volunteers.

"Rachel and her team of CSU students have implemented a technology program unlike anything we've had before at the Fort Collins Senior Center," said Ashley Ruffer, senior recreation coordinator. "The one-on-one attention that each participant gets helps them achieve their goals, and we have had nothing but great response from our community. Each class is full, with a waitlist of 10 or more, so demand for this program continues to be very high."

In each technology class, participants receive step-by-step instructional handouts and are paired with CSU student volunteers to guide them through the tutorial and answer any questions about the day's topic.

Washburn decided to take 'Tech Skills' online after a year of teaching at the Senior Center, where participants frequently requested extra copies of the handouts to share with friends and family.

Senior centers, libraries, and community organizations consistently see a high demand for technology classes and resources as digital tools take on a more vital role in daily life. At

Colorado State University, the need for technology education is growing similarly, with rural health specialists from CSU Extension frequently receiving community feedback calling for 'technology 101' resources across the state.

Motivated by this feedback, Washburn was inspired to develop a free, user-friendly 'Tech Skills' website, making her handouts available to those in and outside of Fort Collins.

"I wanted to create an age-friendly website where these materials could be easily downloaded and printed, ensuring access for older adults unable to attend in person," Washburn said.

"It was important to me that the website's design was accessible to people of varying technology skill levels," she added. "As I guide users through each step, I include 'Tech Tips' to highlight important icons or gestures that might not warrant a separate step but are crucial for navigating the app." For example, Washburn might demonstrate how to use the "Back" icon or how to operate a slider tool by swiping horizontally.

By the end of spring 2024, Washburn had developed 15 video tutorials and supplemental guides, covering existing topics from her in-person classes as well as new tutorials, such as finding friends, chatting online, and interacting with online communities using the Facebook app. Each tutorial begins with app download instructions and progresses to navigating key features.

Donna Richardson, a community member and regular attendee of Washburn's classes, shared the website with her family in Florida.

"Rachel's voice quality and pace is reassuring to older adults and the content is so useful," Richardson said.

Look Into Your Heart - Art & Aging Exhibition
3rd Place Winner: Peyton Anderson

RESEARCH

LONGITUDINAL COVID-19 SURVEILLANCE IN LONG-TERM CARE STUDY

The Center's COVID-19 surveillance testing project, funded by a $20.3 million grant from the state of Colorado, concluded in 2023. The project resulted in a vast longitudinal specimen archive, comprising more than 250,000 nasal swab samples from approximately 8,000 staff and residents in long-term care communities. CHA leaders believe that this rare and unique samples set is the largest longitudinal archive of COVID-19 samples, not only in the U.S. but also possibly worldwide.

In FY24, the Center focused on continuing to catalogue this valuable asset for global investigators. Efforts included hardening infrastructure to ensure sample integrity and creating sample and data management workflows to link each anonymized sample to its metadata.

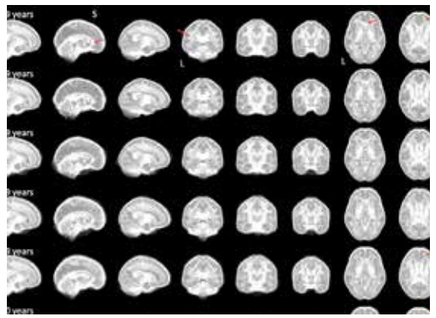
This crucial resource is now aiding investigators in understanding the spread of COVID-19 in long-term care facilities (LCTFs) and in developing strategies to safeguard the safety and well-being of residents and staff in these communities. Well-curated biorepositories, like the one established through this project, play a pivotal role in pandemic readiness and predicting future disease emergence in vulnerable populations, such as those in LTCFs.

The availability of genetic material from COVID-19 and related viruses, along with positive and negative tissue/fluid samples, is essential. Researchers need ready access to these resources to expedite the development of diagnostics, surveillance tools, and therapeutics, ultimately preventing the global spread of diseases.

Nathan Larson (pictured) serves as the Center's bioarchivist, playing a crucial role in safeguarding invaluable data. The Center's extensive archive, containing COVID specimens and data from over 8,000 individuals in senior living communities, is now being analyzed to drive life-saving insights. This research is essential in developing strategies to protect vulnerable residents and dedicated staff from future respiratory virus outbreaks, ultimately strengthening public health resilience and preparedness.

Special report excerpts from SOURCE

AGING & BRAIN HEALTH



The war against Alzheimer's disease is more important than ever, and newly published research from Colorado State University' Center for Healthy Aging affiliate faculty member, Dr. Aga Burzynska is providing new pathways to explore.

Burzynska's recent research indicates a link between metabolic health and brain health that could lead to clues about age-related cognitive decline and dementia.

In two recent studies about risk factors in healthy adults and correlations within the brain's wiring published by ScienceDirect.com, Burzynska's team found that a greater risk of metabolic syndrome – especially greater combined body mass index (BMI) and waist circumference – correlates with lower brain myelin, the part of our brain's tissue that allows fast conduction of electrical signals.

THE KEY TO HEALTHY AGING

Henry Thompson, director of Colorado State University's Cancer Prevention Laboratory, joined the College of Agricultural Sciences more than 20 years ago, and has been researching the healthy benefits of dry beans just about ever since. "We should be having beans in everything," he said. "Bean smoothies, bean bread, bean muffins."

It was a colleague who first suggested Thompson look into the benefits of the dry, edible seeds of legume plants known as pulses. (In addition to beans, other types of pulses include chickpeas, lentils and dry peas.) Since then, Thompson has traveled the world preaching the dry-bean gospel. Among other findings, Thompson noted that pulse consumption appears to lower cardiovascular disease biomarkers, suggesting it may be a cost-effective dietary strategy to help prevent the disease.

Read the full SOURCE articles on healthy aging

HEALTHY COMPETITION

Whether it's an Apple Watch, a Fitbit, a Garmin or even a Oura ring, wearable health trackers are big business right now. A $54 billion business.

These devices monitor everything from how many steps we take in a day to how many calories you burn during a workout, to how well we sleep at night. But does this technology actually encourage better health? Does hearing that little voice declare "exercise ring closed" actually motivate people to work out? Find out by scanning the QR code.

VIRTUAL REALITY'S HEALTH BENEFITS

Stepping out on a nature trail in the mountains can be invigorating for both the mind and body, but not everyone can make it to a trailhead or the peak. Older adults may be homebound or limited in their mobility – potentially preventing them from accessing a valuable resource to support their mental and physical health late in life.

A team of researchers at Colorado State University is working to better understand the potential health benefits they may be missing out on and how a carefully crafted virtual reality environment could be leveraged instead of the real thing to help lower stress and improve cognitive ability. Their early work collecting data on campus in fall 2023 is informing future research on the benefits of nature intervention in older individuals.

LIVING LONGER, HEALTHIER, HAPPIER

Because Colorado's population is shifting, Engagement and Extension has prioritized healthy aging in recent years, with more programs in the works and an infusion of funding from the Colorado State University System Board of Governors through the Rural Initiative.

"We know that the demographics are moving toward an older population, especially in our rural communities," said Sue Schneider, state health specialist with the Office of Engagement and Extension, "We need to make sure we're responding, providing resources and engaging older adults in the work that we're doing." Read more about how the Office of Engagement and Extension is taking action by using the QR code.

HELP US DEVELOP OUR UNDERSTANDING OF AGING

JOIN *our* RESEARCH REGISTRY

We are seeking to collect names and contact information from individuals of all ages who are interested in participating in research at CSU on healthy aging and age-related conditions. Your contact information will be stored in a secure database and limited to Center for Healthy Aging faculty upon request. You may choose the type of study for which you are interested in being contacted. CSU researchers who are recruiting participants for studies that align with your chosen interests may contact you to gauge your interest and eligibility for a specific research study. Choosing to join the research registry does not obligate you to participate in research or guarantee eligibility.

If you are a researcher with participants who agree to be contacted for future studies or a community member interested in participating in research:

col.st/p9xxg

(970) 495-2528

CHAResearchRegistry@colostate.edu

STUDIES SUPPORTED IN 2024

The Center also supports studies conducted by its affiliate faculty members who use Center facilities or the administrative support of Center staff. The following is a partial list of studies supported in FY 2024:

Aging Naturally: Understanding How Spending Time in Nature Affects Older Adults' Health and Well-Being

PIs: Sara LoTemplio, Department of Human Dimensions of Natural Resources); Deana Davalos, Department of Psychology; Francisco Ortego, Department of Computer Science

In FY24, this research team completed pilot data to determine whether exposure to natural environments enhances cognition, mood, and stress in older adults compared to a control environment, including virtual reality for those unable to participate in nature therapy. They gathered data from 60 participants (35 young adults and 26 older adults), finding nonsignificant trends that virtual reality improved some cognitive outcomes more than real-world nature, while real-world nature more effectively reduced perceived stress. The team presented their findings at the 2024 IEEE VR conference in Orlando, where they won the Best Poster award. A manuscript, led by Sharde Johnson, was submitted at the end of 2024, and follow-up data is being collected to address limitations of the initial study.

Biological Age: Health of Your Cells vs. Your Age in Years

PIs: Tom LaRocca, Department of Health and Exercise Science

The Bio-Aging Study investigates how cellular stress, gene expression, and repetitive DNA elements in the genome relate to age-related inflammation, potentially revealing new biomarkers to better understand and track the human aging process. As part of the study, participants complete surveys about their health, undergo cognitive and physical function tests, and provide blood samples. To date, researchers have studied 62 subjects and have one manuscript in progress based on initial findings.

Biomarker Research in Aging Dogs

PIs: Stephanie McGrath, Department of Clinical Sciences, and Julie Moreno, Department of Environmental and Radiological Health Sciences

The BIORAD study entered its 3rd year in FY2024. This study focuses on dogs with Canine Cognitive Decline (CCD), a disease that is remarkably similar to Alzheimers Disease in humans. The study compares pet dogs with CCD and similar aged pet dogs without CCD using cognitive behavioral testing, biomarker analysis and specialized MRIs (magnetic resonance imaging) to help canine patients with CCD and hopes to translate those findings to meaningful opportunities to stop Alzheimer's Disease progression in humans as well.

STUDIES SUPPORTED IN 2024 CONTINUED

Dementia Care Partners Experiences and Communication

PIs: Meara Faw and Michelle Matter, Department of Communication Studies

Faculty researchers received IRB approval to examine the experiences of dementia care partners, focusing on how they navigate support needs, manage challenges, and find successes in providing care for a person with dementia. They trained all team members, including graduate and undergraduate researchers, in interview techniques and conducted 36 in-depth interviews with participants, nine of which were recruited directly from CHA. The team is now transcribing and analyzing data, with conference presentations and publications planned for 2025.

The Dog Aging Project: Genetic and Environmental Determinants of Healthy Aging in Companion Dogs

Co-Directors: Daniel Promislow and Matt Kaeberlein, University of Washington; Chief Veterinary Officer: Kate E. Creevy, Texas A&M University

The Dog Aging Project is a long-term study launched in 2018 to investigate healthy aging in companion dogs, aiming to uncover the genetic and environmental factors that shape aging and inform potential interventions for humans. The project has successfully enrolled nearly 50,000 dogs, collecting owner-reported data, biospecimens, and environmental information to support research on aging. It focuses on defining aging through new indices of frailty, discovering influencing factors, and conducting the first double-blind veterinary trial on rapamycin's effects on canine health and lifespan. Funded by U19 grant AG057377 from the National Institute on Aging and private donations, the project promises to advance geroscience and veterinary science while engaging the public in its mission.

Evaluating Yoga Intervention Induced Changes in Performance and Neurophysiology in Adults with Chronic Human Brain Injury A Pilot RCT

PI: Jaclyn Stephens, Department of Health and Exercise Science; Co-I: Arlene Schmid, Department of Occupational Therapy

This study aims to see if group yoga provides greater benefits than group low-impact exercise for adults with long-term brain injuries. Specifically, the research team is testing for improvements in balance, nervous system function, and quality of life. In Fall 2023, researchers enrolled 17 adults in their second study cohort and published their protocol paper in Frontiers in Human Neuroscience. By Spring 2024, they completed data collection and analysis and published primary findings in the journal Sensors, and shared results at two conferences. The research team currently has multiple abstracts under review for international conferences and is preparing four additional manuscripts, with five early-career trainees as co-authors, highlighting the project's strong training and mentoring opportunities.

Female Sex Hormones and Neuromuscular Function

PIs: Brett Fling and Kristin A. Johnson, Department of Health and Exercise Science

This research examines how brain and muscle function, walking, and balance performance vary across different phases of the menstrual cycle. It seeks to fill the research gap on how hormonal fluctuations (such as estrogen and progesterone) affect women's brain and motor function, particularly during significant life stages, like pregnancy and menopause. Researchers obtained IRB approval in Spring 2024, with data collection starting in Summer 2024. In this longitudinal study, each participant completes four test visits; currently, two participants have finished all visits, while three are still undergoing testing. By the end of FY24, Johnson used preliminary data to submit two grant applications and began collaborating with neurologist Dr. Anna Shah at CU Anschutz to recruit women with multiple sclerosis.

Future Brains: Cognitive Engagement in Aging

PI : Michael Thomas, Department of Psychology

The Future Brains study launched in Summer 2023 to explore how education and occupation relate to cognitive aging. So far, 89 participants have enrolled, completing a prescreening phone call, a one-hour online survey, and if eligible, in-person cognitive testing and an MRI scan.

Malleability of Brain Systems that Mediate Wisdom and Reflective Thinking (Wisdom Study)

PI : Michael Thomas, Department of Psychology

This project seeks to assess brain indicators of healthy aging. Its broad aim is to determine whether brain systems that mediate wisdom and reflective thinking are affected by mindful meditation, thereby providing specific targets for interventions aimed at improving wisdom and overall mental health. Data collection has been completed and analyses are ongoing.

Strengthening Capacity to Promote Healthy Behaviors and Improve Quality of Life for Older Adults in Rural Colorado

PIs : Sue Schneider and Ginger Williams, CSU Extension; Evaluation Lead: Christine Fruhauf, Department of Human Development and Family Studies

CSU Extension received a $350,000, three-year grant from the USDA's National Institute of Food and Agriculture through its Rural Health and Safety Education Competitive Grants Program to support healthy aging initiatives in Colorado. The funding will expand training for Extension professionals and community partners through a new "Advancing Healthy Aging" webinar series, provide facilitator training for the Aging Mastery Program, and offer technical assistance, including Spanish-language support, for new host sites to implement AMP in their communities.

IN-REACH PILOT PROJECT UPDATES

In January 2023, the Center awarded four research teams a total of $200,000 for pilot research projects that involve inter/transdiciplinary approaches to societal, behavioral, environmental, and biological aspects of healthy aging. The funding opportunity was named the INterdisciplinary REsearch into Aging CHallenges Pilot Grant Program and its objective was to support the creation of new, interdisciplinary research teams and preliminary data that will position CHA's affiliate faculty and their research teams to be competitive for follow-up funding in novel, transdiciplinary aging research. We are proud to announce that the projects are now complete and the awardee's have reported their results. Thus far, the pilot grant funding has resulted in the publication of 4 manuscripts, the submission of three large proposals to federal funding agencies and numerous conference presentations. We are now exploring topics for the next round of pilot grants with a goal to open applications in August 2025.

STEPHEN AICHELE

Assistant Professor, Department of Human Development and Family Studies

"The influence of air pollution exposure on cognitive decline, cognitive impairment, and dementia risk in middle-aged and older adults."

TOM LAROCCA

Assistant Professor, Department of Health and Exercise Science

"The healthspan van: A mobile research unit for identifying mediators of health and aging across diverse Colorado communities."

JULIE MORENO

Assistant Professor, Department of Environmental and Radiological Health Sciences

"Acute peripheral infection and associated greater long-term risk of neurodegenerative pathologies: A pilot study of urinary tract infection in a natural model of age-related neurodegeneration."

TIANJIAN ZHOU

Assistant Professor, Department of Statistics

"Creating a pragmatic decision-making tool to guide the delivery of rehabilitation services."

BLOG

Aging Your Way with Smart Home Technology

by Rachel Washburn

Aging in place, the concept of growing older within the comfort of one's familiar home, is increasingly sought after as the U.S. population ages. Rather than moving to a senior living community or long-term care facility, a growing number of older adults are choosing to age in place. AARP estimates the number of people ages 65 and older who choose to age in place will increase from 34 million today to 48 million by the year 2050.

For some, a wave of innovative, assistive technologies is making aging in place even more desirable. Assistive technologies can include any device that accommodates a disability to complete a task. In a previous blog, we explored the use of assistive robots to promote healthy behaviors and communication. Today, we will expand on an evolving field within assistive tech, called smart home technology, and how it can support aging in place.

SMART HOME TECHNOLOGY

Welcome to the future of home living, where the touch of a smartphone or tablet is all it takes to manage your household devices. Many smart home products can provide up-to-date information that can typically be viewed on the same app. For example, a schedule to turn on a smart home sprinkler system can be adjusted remotely using an app. The same app may also suggest schedule changes based on weather patterns or alert the homeowner if there is

something preventing the sprinkler system from working properly. Below are some smart home products that can support aging in place with food preparation and medication management.

IN THE KITCHEN

Many adults experience a decreased ability to taste and smell in older age, which limits their ability to prepare meals safely and independently. Impaired taste and smell may lead to consuming spoiled or undercooked ingredients, resulting in gastrointestinal illnesses. Some smart home ovens help prevent the consumption of raw meat by including a meat thermometer. When the meat has reached a safe temperature for eating, the oven's app can notify the user.

In addition to a meat thermometer, some smart ovens add an extra layer of safety via stove sensors. A stove sensor will turn off the stove if it does not detect bodily movement in front of it after five minutes. If an older adult is planning on leaving the stove for more than a few minutes, they can use an app that is connected to the stove sensor to tell it when they plan on returning. Food preparation is one important task that smart home technology can assist with, but it can also help with managing medications.

MEDICATION MANAGEMENT

Some older adults, particularly those living with mild cognitive impairment or early stages of dementia, may have difficulty self-administering the right medication at the correct time at home. Popular medication management strategies include using a pill organizer and following a consistent daily routine. Some older adults rely on a care partner to safely take their medications.

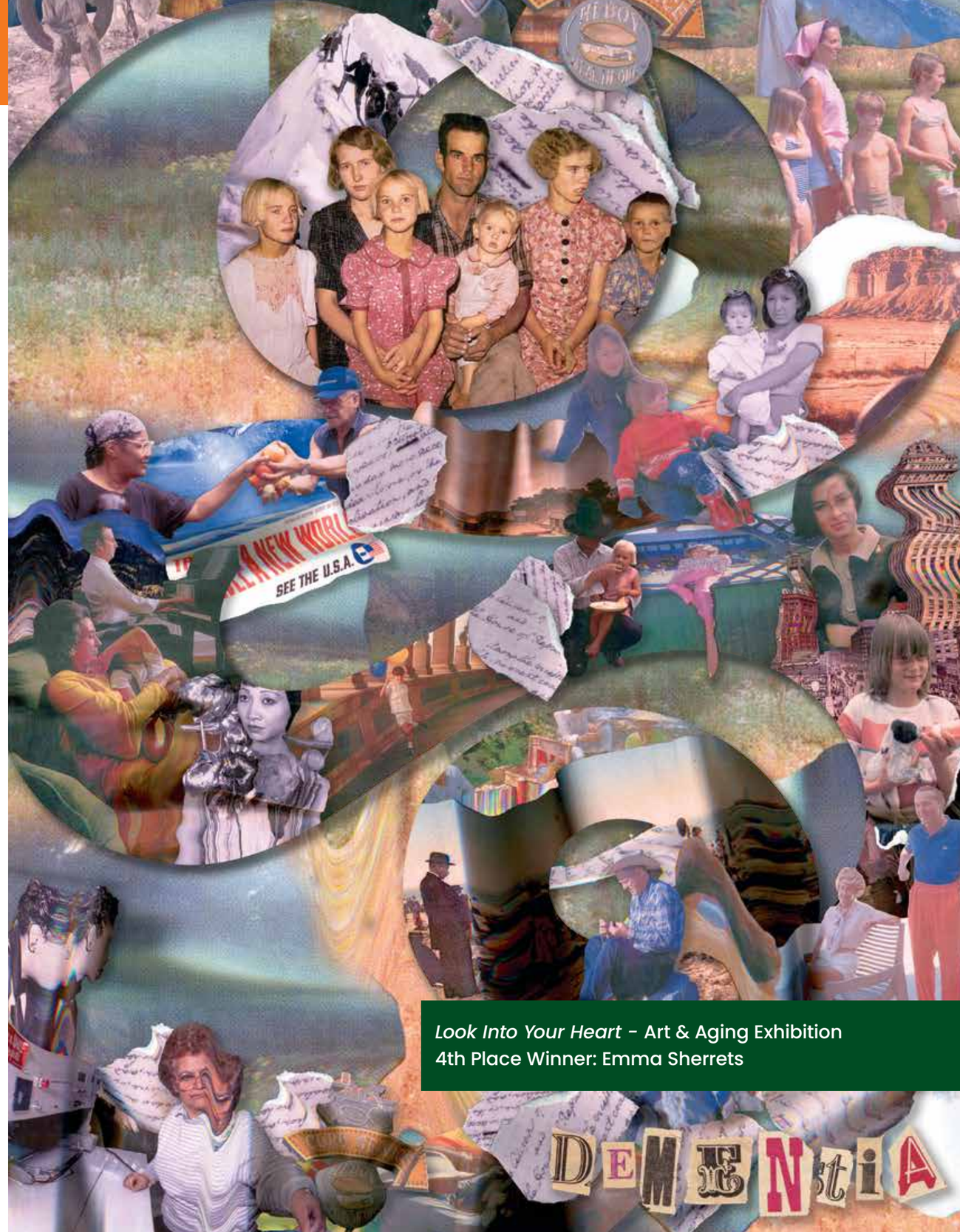
An automated medication dispenser utilizes smart home technology to administer medication at the right time. The dispenser machine audibly notifies the older adult with a loud sound, while an app wirelessly connected to the dispenser can also provide notifications that a medicine has been dispensed. As an older adult removes medication from the dispenser's tray, the machine records the exact time of medication intake in the app for future reference. Family members and care providers can also use the app on their phones to ensure the medication dispenser is being used properly. The smart home medication dispenser may also alert the older adult's pharmacy to mail a refill if a medication is running low. Although the dispenser can assist with managing multiple medications, an older adult may need some assistance with setting up the dispenser and refilling it.

CONCERNS AND HESITATIONS

Although technology can support some aspects of aging in place, some are hesitant to integrate smart home technology in their homes.

In a study conducted by the University of Bristol, researchers installed a series of motion sensors that can contact emergency services and family members if a fall is detected. Older adult participants expressed a need for more instruction on using the device. The participants also wanted to know how much information the device needed to detect a fall and the likelihood of a false positive response. Participants also disclosed that gradual adoption of smart home technology makes them more comfortable to use it, compared to having many devices installed in their homes in a short amount of time.

Smart home technology is a new and developing field with unique products being introduced to the public frequently. Consumers should research if certain smart home devices are suitable for their needs before they tap into this advancing field.



Look Into Your Heart - Art & Aging Exhibition
4th Place Winner: Emma Sherrets

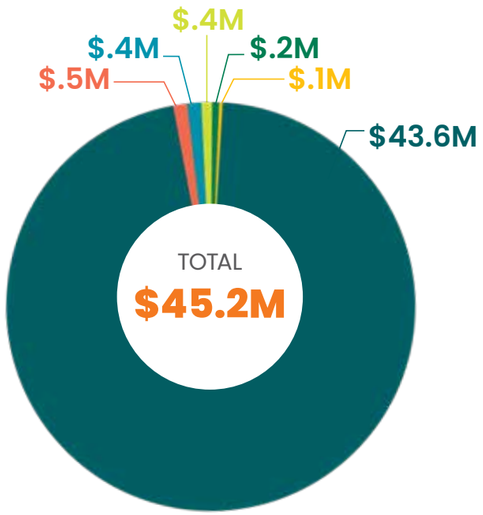
FINANCIAL Report

FY24 SUMMARY OF PROPOSED AND AWARDED FUNDING FOR AGING-RELATED RESEARCH

PROPOSALS SUBMITTED
62

PROPOSAL FUNDING REQUESTED
$45.2M

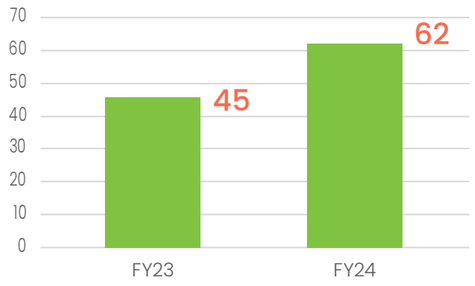
$6.9 *MILLION*
TOTAL ACTIVE AWARDS



AGING-RELATED RESEARCH PROPOSALS
Totals By Sponsor Type

- Federal
- Domestic Commercial
- Domestic Nonprofit
- Domestic Foundation
- State of Colorado
- State of Colorado Higher Ed

AGING-RELATED RESEARCH PROPOSALS: TOTAL # SUBMITTED



TOTAL OPERATING EXPENSES

FY24	$579,907
FY25 projected	$586,346
FY26 projected	$586,963

EXTERNAL FUNDING

Aging research at CSU spans eight colleges/divisions and 26 departments and is funded by federal grants, industry partnerships, and philanthropic foundations.

$406,535 9/29/22 TO 5/30/24	**A Novel Approach to Study Mechanisms of Age Related Dysfunction in Hypoxia-Induced Erythrocyte ATP Release** *(PI, Daniel Lark)* HHS-NIH-National Institutes of Health
$60,000 2/22/24 TO 02/27/26	**A Novel Gene Therapeutic Approach to Osteoarthritis in Companion Animals** *(PI, Laurie Goodrich)* Colorado Office of Economic Development and Inernationall Trade
$1,131,713 9/14/22 TO 05/30/27	**Age-Related Repetitive Element Dysregulation, Neuroinflammation and Alzheimer's Disease** *(PI, Thomas LaRocca)* HHS-NIH-National Institutes of Health
$2,000 4/30/19 TO 04/29/24	**Antihypertensive and Vascular-Protective Effects of Wild Blueberries in Middle-Aged/Older Men** *(PI, Sarah Johnson)* Wild Blueberry Association of North America
$2,016 4/30/23 TO 4/29/24	**Building Community Capacity for Healthy Aging Research and Programming in Northeastern Colorado** *(PI, Christine Bubien)* University of Colorado at Denver; HHS-NIH-National Institutes of Health
$39,706 6/30/23 TO 6/29/26	**Role of ADAR1 and dsRNA in Age-Related Neuroinflammation and Alzheimer s Disease** *(PI, Thomas LaRocca)* HHS-NIH-National Institutes of Health
$60,359 4/30/19 TO 4/29/24	**Cannabis Use among Older Adults: Potential Risks and Benefits to an Aging Population** *(PI, Brian Tracy)* University of Colorado; HHS-NIH-National Institutes of Health
$300,000 1/01/23 TO 12/31/25	**Co Activation of Selective Nicotinic Acetylcholine Receptors Improves Hippocampal Inhibitory Activity and Oscillations in Alzheimer's Disease** *(PI, Seonil Kim)* BrightFocus Foundation
$269,213 7/01/22 TO 6/30/24	**Evaluation of High Energy Focused Shock Wave Therapy for Treatment of Osteoarthritis and Prevention of Contralateral Stifle Injury in Dogs** *(PI, Felix Duerr)* Zomedica
$173,903 10/31/20 TO 10/30/24	**Evaluation of the Effect of Intra-Articular Injection of a Proprietary Extracellular Matrix for Osteoarthritis-Associated Pain in Dogs** *(PI, Felix Duerr)* PetVivo Holdings, Inc.
$368,549 1/31/22 TO 1/30/24	**Evaluation of Two Joint Supplementation Formulas for the Treatment of Naturally-Occurring Canine Osteoarthritis** *(PI, Felix Duerr)* Zoetis

$13,029 9/17/23 TO 8/30/25	**Exercise Adherence and Cognitive Decline: Engaging with the Black Community to Develop and Test a Goal-Setting and Exercise Intensity Intervention** *(PI, Heather Leach)* University of Colorado; HHS-NIH-National Institutes of Health
$74,284 11/14/24 TO 11/13/25	**Mitochondria-Derived dsRNA in Brain Aging and Alzheimer's Disease** *(PI, Thomas LaRocca)* HHS-NIH-National Institutes of Health
$149,947 8/01/22 TO 7/31/25	**Harnessing Behavioral Fluctuations to Predict Driving Deficits in MCI** *(PI, Neha Lodha)* Alzheimers Association
$327,294 1/01/21 TO 12/31/25	**Investigating Cognitive-Motor Variability to Predict Driving Performance in Stroke Survivors with MCI** *(PI, Neha Lodha)* HHS-NIH-National Institutes of Health
$188,934 11/15/21 TO 11/14/24	**Investigating the Effect of Cannabinoids on Naturally Occurring Canine Cognitive Dysfunction Syndrome as a Surrogate for Alzheimers Disease** *(PI, Stephanie McGrath)* Panacea Life Sciences
$55,000 1/01/23 TO 12/31/23	**Nuclear Receptor NR4A2 as a Therapeutic Target for Parkinsons Disease** *(PI, Ronald Tjalkens)* Consolidated Anti-Aging Foundation
$1,199,032 8/01/22 TO 7/31/24	**Nuclear Receptor NR4A2/Nurr1 as a Therapeutic Target for Neurotoxic Injury in Parkinson's Disease** *(PI, Ronald Tjalkens)* DOD-US Department of Defense
$24,805 1/30/24 TO 3/27/25	**Repetitive Mild Traumatic Brain Injury and Signs of Accelerated Neurocognitive Aging in Young Adults** *(PI, Jaclyn Stephens)* Brain Injury Association of America
$78,830 8/31/22 TO 8/30/24	**Role of Age-Associated Epigenetic Repetitive Element Derepression in Alzheimer's Disease** *(PI, Thomas LaRocca)* HHS-NIH-National Institutes of Health
$100,000 6/30/24 TO 6/29/26	**Social Prescription for Loneliness in Community-based Group Exercise Classes for People with Parkinson Disease** *(PI, Laura Swink)* American Occupational Therapy Foundation
$40,552 11/20/22 TO 11/19/23	**Telomere Dynamics and Oxidative Stress in Arabidopsis in the Space Radiation Environment** *(PI, Susan Bailey)* Texas A and M University; NASA-National Aeronautics and Space Administration
$1,182,000 1/30/19 TO 1/29/26	**Telomeres and the One Year Mission Project** *(PI, Susan Bailey)* NASA-National Aeronautics and Space Administration
$165,475 4/01/23 TO 3/31/25	**Transcriptomic Response to Osteoarthritis Using Single Cell Sequencing Approaches** *(PI, Lynn Pezzanite)* Grayson-Jockey Club Research Foundation
$28,452 6/30/20 TO 6/29/26	**U 19 Dog Aging Project TRIAD (Project 4)- Trial of Rapamycin in Aging Dogs (TRIAD)** *(PI, Brian Scansen)* University of Washington; HHS-NIH-National Institute on Aging
$44,282 12/05/22 TO 11/30/27	**Understanding Biological and Lifestyle Contributions to Alzheimer's Disease Pathology and Clinical Profiles in Black Women: Defining Prevention Targets in High Risk Groups** *(PI, Michael Thomas)* University of California, San Diego; HHS-NIH-National Institutes of Health
$131,624 7/01/21 TO 6/30/24	**Role of Repetitive Element Transcripts in Brain Aging and Alzheimer's Disease** *(PI, Devin Wahl)* HHS-NIH-National Institutes of Health
$149,983 1/01/22 TO 12/31/24	**White Matter: A Target for Lifestyle Interventions to Prevent Dementia** *(PI, Agnieszka Burzynska)* Alzheimers Association
$150,546 7/31/23 TO 7/30/26	**Food Insecurity and Diabetes Education for American Indian and Alaskan Natives with Type 2 Diabetes** *(PI, Christopher Gentile)* HHS-NIH-National Institutes of Health
$6,918,063	**TOTAL**

Affiliate FACULTY

COMPARATIVE AGING

COGNITIVE, SOCIAL, AND BEHAVIORAL AGING

AGE-FRIENDLY ENGINEERING, DESIGN, AND REHABILITATION

BIOLOGY AND PHYSIOLOGY OF AGING

Faculty affiliates' research interests fall into one of four categories: comparative aging; cognitive, social, and behavioral aging; age-friendly engineering, design, and rehabilitation; or biology and physiology of aging.

NEW AFFILIATE FACULTY

COLLEGE OF VETERINARY MEDICINE AND BIOMEDICAL SCIENCES

Grace Borlee | Microbiology, Immunology, and Pathology
Intergenerational learning in undergraduate STEM education; Arthropod microbiomes.

COLLEGE OF HEALTH AND HUMAN SCIENCES

Alison Herman | Occupational Therapy
Activities promoting health, wellness and chronic disease management in adults and older adults.

Jaewon Kang | Occupational Therapy
Environmental interventions and technology to enhance independence for aging individuals with disabilities; improving health care access in rural areas through the U.S. Department of Veterans Affairs

Jaclyn Stephens | Health and Exercise Science
How sports-related concussions and acquired brain injuries (e.g., TBI, stroke) increase dementia risk in young and older adults.

Janell Pisegna | Occupational Therapy
Supporting older adults in chronic disease management, survivorship and healthy aging, especially with comorbid mental illness; Addressing needs of the rural older adult community.

Julie Silver Seidle | Occupational Therapy
Resilience in aging, dementia caregiver experiences, and the role of occupation during and after caregiving.

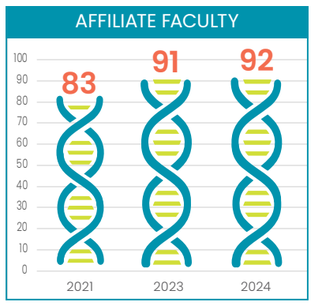
Laura Swink | Occupational Therapy
Community-based programming for people with Parkinson's disease; Dual-task training for older adults.

Jen Weaver | Occupational Therapy
Addressing rehabilitation outcomes for adults.

OFFICE OF ENGAGEMENT & EXTENSION

Sue Schneider
Health resource access among older adults in rural communities; Impacts of Extension programming on social isolation and healthy aging; Mindfulness and aging.

Growth of Affiliate Faculty Over Time



Growth in Departments and Colleges Over Time

2019	2022	2024
4 & 16	7 & 22	8 & 26
COLLEGES DEPTS	COLLEGES DEPTS	COLLEGES/ DIVISIONS DEPTS

A key goal of the Center is to bring together faculty working on cutting edge research in topics related to healthy aging. Currently, the Center has more than 92 faculty affiliates across eight colleges/divisions and 26 departments.

CHA FACULTY AFFILIATES

COLLEGE OF BUSINESS

Adela Chen | Computer Information Systems
Understanding the use of information communication technologies among individuals, including older adults, with emphasis on the impact of technology use in work and nonwork domains.

Harry Turtle | Finance and Real Estate
Financial decisions of households represented in the Health and Retirement Study and the RAND American Life Panel.

Tianyang Wang | Finance and Real Estate
Household financial planning strategies for managing longevity risk; behavior finance.

WALTER SCOTT, JR. COLLEGE OF ENGINEERING

Tony Maciejewski | Electrical and Computer Engineering
Rehabilitation robotics to aid recovery from injuries; Social robotics for cognitive or emotional support.

Kirk McGilvray | Mechanical Engineering
Deterioration and/or trauma to the skeletal system and soft tissues; development of advanced materials, techniques, and devices to monitor and aid in the treatment of these conditions.

Stu Tobet | School of Biomedical Engineering
Structures in the brain that control neuroendocrine functions; Microbiome and aging.

Zhijie Wang | Mechanical Engineering
Cardiovascular biomechanics at different scales (single segment of artery to whole organs, including the heart and lungs).

Jianguo Zhao | Mechanical Engineering
Design and control of robotics devices.

COLLEGE OF HEALTH AND HUMAN SCIENCES

Stephen Aichele | Human Development and Family Studies
Cognitive epidemiology; Advanced longitudinal modeling and machine learning approaches to risk analysis (for cognitive decline, depression, mortality) in middle-aged and older adults; Cognitive testing for early diagnosis.

Allyson Brothers | Human Development and Family Studies
Promotion of healthy aging throughout the lifespan; attitudes toward aging and awareness of age-related change; the influence of attitudes toward aging on health, well-being, and health behaviors; rural aging experiences.

Barry Braun | Health and Exercise Science
Effects of physical activity and pharmacology on prevention and management of Type 2 diabetes.

Anita Bundy | Occupational Therapy
Fitness to drive; everyday time use.

Aga Burzynska | Human Development and Family Studies
Interconnections between brain structure and function, cognitive functioning, and physical health in older age.

Josiane Broussard | Health and Exercise Science
The role of sleep and circadian physiology in metabolic homeostasis; Modifying behaviors (sleep, exercise, and eating) to improve health.

Chris Bell | Health and Exercise Science
Diabetes; control of blood glucose in aging.

Allison Bielak | Human Development and Family Studies
Normal and pathological cognitive changes in adulthood; influence of lifestyle factors on cognitive aging; intraindividual variability in cognitive speed and how it relates to cognitive ability, health, and possible dementia prediction.

Eunhee Choi | Social Work
Aging, health, and policy, particularly for older workers and volunteers; research methodology and program evaluation.

Jen Currin-McCulloch | Social Work
Psychosocial adaptions to serious illness and how people cope at end-of-life; caregiver experiences.

Maria Delgado | Design and Merchandising
Aging in place; housing design.

Manfred Diehl | Human Development and Family Studies
Awareness of age-related change and its role in successful aging; personality development in adulthood and its contribution to successful aging; experience and regulation of emotion in adulthood..

Aaron Eakman | Occupational Therapy
Meaningfulness of everyday activity; behavioral (i.e., non-pharmacological) interventions to promote sleep.

Brett Fling | Health and Exercise Science
Neuromechanics, brain imaging, gait, and balance in multiple sclerosis, Parkinson's, aging.

Christine Fruhauf | Human Development and Family Studies
Grandparent and grandchild relationships; grandparents raising grandchildren; GLBT grandparenting.

Chris Gentile | Food Science and Human Nutrition
Novel treatments to preserve endothelial function in aging.

James Graham | Occupational Therapy
Rehabilitation health services.

Karyn Hamilton | Health and Exercise Science
Integrative, comparative, and translational approaches to increasing human healthspan.

Sarah Johnson | Food Science and Human Nutrition
Functional foods, cardiovascular disease, and postmenopausal women.

Dan Lark | Health and Exercise Science
The contribution of secreted extracellular vesicles (i.e., exosomes) to age-related metabolic disease.

Tom LaRocca | Health and Exercise Science
Biological mechanisms of aging; interventions for increasing healthspan.

Heather Leach | Health and Exercise Science
Physical activity interventions to minimize recurrence and optimize physical health and well-being in cancer survivors.

Neha Lodha | Health and Exercise Science
Neurophysiology and motor skill rehabilitation in stroke and TIA

Laura Malinin | Design and Merchandising
Age-related cognitive decline and enriched environments.

Arlene Schmid | Occupational Therapy
Complementary and integrative therapies such as yoga for fall prevention in older adults and people with stroke or other neuro conditions; self-management of chronic conditions.

Brian Tracy | Health and Exercise Science
Examining the mechanisms that explain neuromuscular decline with aging and the physical functional consequences of the changes.

Gloria Luong | Cognitive, Social, and Behavioral Aging
Socioemotional dynamics and emotion regulation across the life-span; emotional and physiological stress reactivity and recovery; developmental links between social relationships, emotions, health, and well-being.

Jain Kwon | Design and Merchandising
Neurodesign for physical and virtual environments; Gaze behaviors in wayfinding; Spatial perception and cognition in health care environments; Kinesthetic experience in multisensory settings.

Elicia Ratajczyk | Institute for the Built Environment
Environmental social science; sustainable urban infrastructure; Lifelong Homes Initiative.

Tiffany Weir | Food Science and Human Nutrition
Disruptions to the gut microbiome and the development of age-associated chronic diseases, such as cancer and cardiovascular disease.

COLLEGE OF LIBERAL ARTS

Meara Faw | Communication Studies
Positive communication and intervention strategies for caregivers; community-based experiences to promote healthy aging in people with cognitive impairments and their caregivers.

Ray Miller | Economics
Economics of caregiving, population aging, the inequality of health and economic well-being among older populations; health policy.

Lisa Morgan | Dance
Movement/dance and Parkinson's disease.

Lindsey Wilhelm | Music Therapy
Music therapy for care partners and aging adults with neurologic conditions.

COLLEGE OF NATURAL SCIENCES

Silvia Sara Canetto | Psychology
Cultural scripts of suicide and hastened death; the paradox of U.S. older-adult white men's suicide vulnerability; Stereotypes of gender, sexual orientation, and aging.

Deana Davalos | Psychology
Understanding the development of time-processing abilities over the lifespan, including older adults, with emphasis on processing time accurately.

Ed DeLosh | Psychology
Aging and memory, including effects of physical fitness on age-related declines in memory.

Gwen Fisher | Psychology
Health and well-being among older workers; retirement, work ability, and prolonged working life; work/nonwork interface, including work/nonwork conflict, enhancement, and work/life balance.

Hollis Karoly | Psychology
Using behavioral measures, molecular biology methods, and neuroimaging techniques to understand the causes and consequences of substance use behavior, especially alcohol and cannabis use.

Niccole Nelson | Psychology
Link between short-term stress and emotion regulation and long-term cognitive, emotional, and physical development in older adults.

Shrideep Pallickara | Computer Science
Cloud computing, distributed systems, content distribution networks, streaming systems.

Matt Rhodes | Psychology
Understanding individual differences in memory, including the impact of healthy aging on memory function.

Eric Ross | Biochemistry and Molecular Biology
Yeast prions as a model for amyloid diseases, including Alzheimer's disease, Parkinson's disease, and transmissible spongiform encephalopathies.

Lubna Tahtamouni | Biochemistry and Molecular Biology
Pathogenesis of cofilin-actin rods in neurodegenerative diseases; Actin dynamics during migration of breast cancer cells.

Michael Thomas | Psychology
Schizophrenia, aging, and dementia; Development of tests to improve the collection and interpretation of cognitive and brain imaging data.

Tingting Yao | Biochemistry and Molecular Biology
Regulatory mechanisms in DNA repair and gene expression; ubiquitin signaling in macroautophagy.

Tianjian Zhou | Statistics
Applied statistics with a focus on clinical trials, cancer genomics, and infectious diseases.

WARNER COLLEGE OF NATURAL RESOURCES

Lise Aubry | Fish, Wildlife and Conservation Biology
Life history trade-offs and senescence in vertebrates.

Sara LoTemplio | Human Dimensions of Natural Resources
How spending time outside in nature can influence human cognition and health.

COLLEGE OF VETERINARY MEDICINE AND BIOMEDICAL SCIENCES

Susan Bailey | Biomedical Sciences
Role of chromosomes and telomeres in cancer and other human disease states, tumorigenesis, and aging.

Adam Chicco | Biomedical Sciences
Various aspects of heart health and disease from the molecular to systemic levels and relation to aging.

Felix Duerr | Clinical Sciences
Small-animal musculoskeletal problems, including arthritis, sports injury treatment, and prevention; canine-to-human translational applications.

Gregory Ebel | Microbiology, Immunology, and Pathology
Virus infection; Nursing home surveillance; Arboviruses; Differential pathology/mortality in older adults.

Nicole Ehrhart | Clinical Sciences
Translational aging, limb preservation, tissue engineering, and sarcoma research; bone and muscle regenerative medicine; canine-to-human translational applications.

Laurie Goodrich | Clinical Sciences
Regenerative medicine; Effects of age on various biologic therapies.

Kelly Hall | Clinical Sciences
Naturally occurring trauma in dogs as a model to identify markers of injury; therapeutic interventions to improve outcomes in geriatric trauma patients.

Marcela Henao-Tamayo | Microbiology, Immunology, and Pathology
Immune responses to vaccines and infectious diseases; how these responses vary with age and in relation to degenerative disorders and co-morbidities; maternal-fetal immune transfer.

Frederic Hoerndli | Biomedical Sciences
C. elegans genetics and in vivo microscopy to study synaptic aging and neurodegeneration.

Seonil Kim | Biomedical Sciences
Neurobiological mechanisms in aging and Alzheimer's disease.

Thomas Kuhn | Microbiology, Immunology, and Pathology
Cellular and molecular mechanisms underlying the decline of neuronal integrity and connectivity in aging individuals; natural product drug development.

Candace Mathiason | Microbiology, Immunology, and Pathology
Prion pathobiology, pathogenesis, trafficking, and transmission dynamics with emphasis on blood-borne prions and asymptomatic disease stage.

Stephanie McGrath | Clinical Sciences
Seizure and spinal cord disorders, inflammatory brain diseases; canine-to-human translational applications.

Julie Moreno | Environmental and Radiological Health Sciences
Cellular stress mechanisms in protein misfolding neurodegenerative diseases, and aging.

Katriana Popichak | Microbiology, Immunology, and Pathology
Neurodegenerative disease and neuroimmunology.

David Rojas-Rueda | Environmental and Radiological Health Sciences
Environmental health; climate change; urban and transport planning; epidemiology; public health; community-based participatory research; environmental justice; health equity.

Elizabeth Ryan | Environmental and Radiological Health Sciences
Food access, affordability, and availability; Brain fog, forgetfulness, and cognitive function concerns in long-COVID and cancer patients.

Kelly Santangelo | Microbiology, Immunology, and Pathology
Osteoarthritis, aging, and obesity; translational analyses that combine therapeutic interventions with molecular mechanisms, advanced imaging, and assessments of mobility.

Brian Scansen | Clinical Sciences
Partner site for the Dog Aging Project; cardiovascular health in animals.

Alan Schenkel | Microbiology, Immunology, and Pathology
Pulmonary fibrosis and non-tuberculosis mycobacterial infections.

Michael Tamkun | Biomedical Sciences
Neuronal response to stroke/ischemia; cell biology of traumatic brain injury.

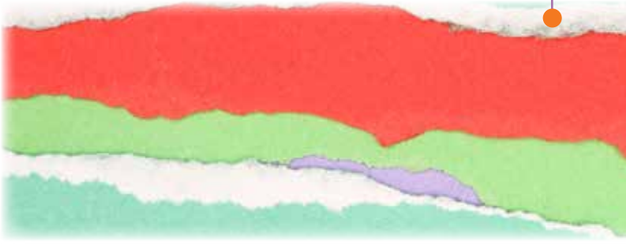
Glenn Telling | Microbiology, Immunology, and Pathology
Mechanisms of prion replication, prion species barriers and strain diversity, and the molecular basis of inherited human prion diseases.

Ron Tjalkens | Environmental and Radiological Health Sciences
Neuroinflammatory mechanisms in neurodegenerative disorders, particularly disorders of the basal ganglia such as manganism and Parkinson's disease.

Susan Tsunoda | Biomedical Sciences
Drosophila genetics to study neurodegenerative disease; aging and Alzheimer's disease.

Jeffrey Wilusz | Microbiology, Immunology, and Pathology
RNA biology; influence of aging on the cell.

Mark Zabel | Microbiology, Immunology, and Pathology
Early lymphoid system distribution of prions and employment of vector systems expressing prion-targeted interfering RNA molecules as therapeutic strategies for prion infections.



Select Faculty PUBLICATIONS

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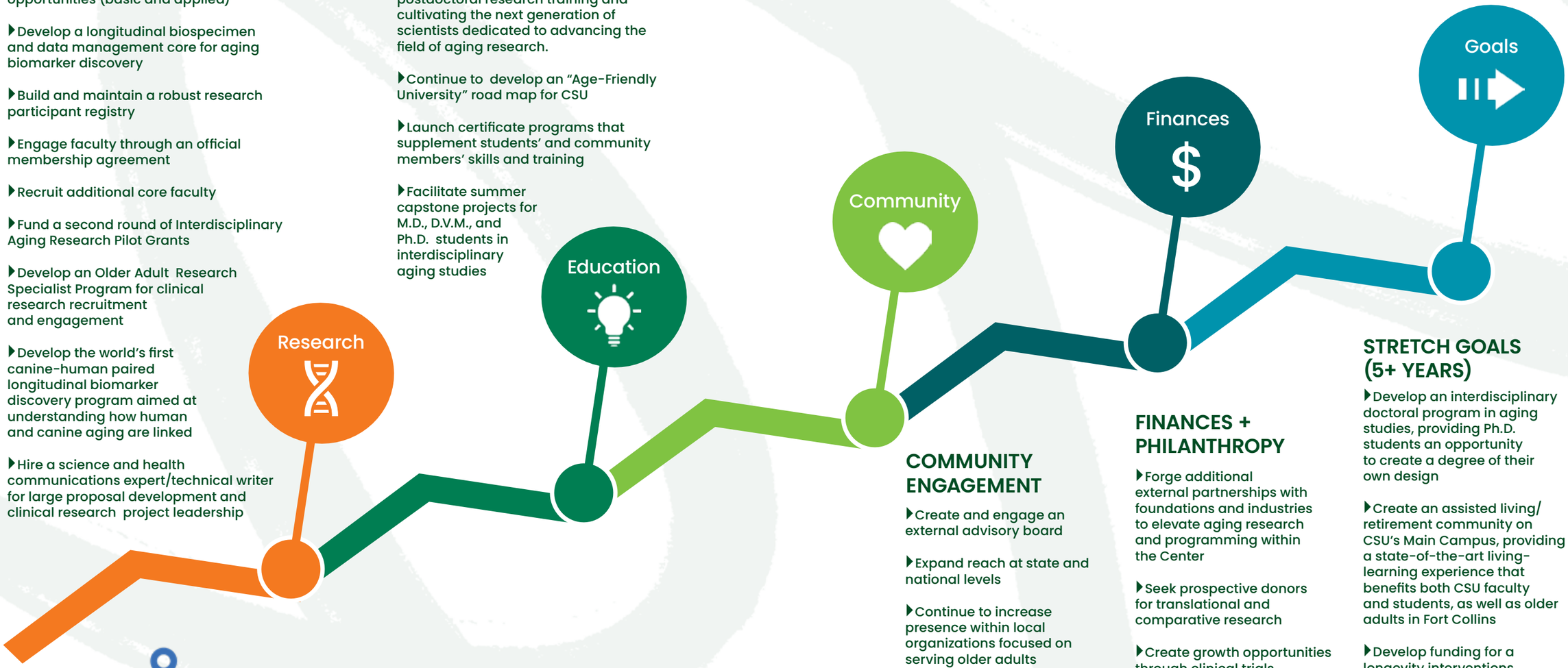
Road Map to the FUTURE

TRANSDICIPLINARY RESEARCH

- Expand comparative aging research opportunities (basic and applied)
- Develop a longitudinal biospecimen and data management core for aging biomarker discovery
- Build and maintain a robust research participant registry
- Engage faculty through an official membership agreement
- Recruit additional core faculty
- Fund a second round of Interdisciplinary Aging Research Pilot Grants
- Develop an Older Adult Research Specialist Program for clinical research recruitment and engagement
- Develop the world's first canine-human paired longitudinal biomarker discovery program aimed at understanding how human and canine aging are linked
- Hire a science and health communications expert/technical writer for large proposal development and clinical research project leadership

EDUCATIONAL

- Secure funding for predoctoral and postdoctoral research training and cultivating the next generation of scientists dedicated to advancing the field of aging research.
- Continue to develop an "Age-Friendly University" road map for CSU
- Launch certificate programs that supplement students' and community members' skills and training
- Facilitate summer capstone projects for M.D., D.V.M., and Ph.D. students in interdisciplinary aging studies



Columbine Health Systems Center for Healthy Aging
COLORADO STATE UNIVERSITY

COMMUNITY ENGAGEMENT

- Create and engage an external advisory board
- Expand reach at state and national levels
- Continue to increase presence within local organizations focused on serving older adults
- Continue to produce the *living healthy longer* podcast and expand impact

FINANCES + PHILANTHROPY

- Forge additional external partnerships with foundations and industries to elevate aging research and programming within the Center
- Seek prospective donors for translational and comparative research
- Create growth opportunities through clinical trials, longitudinal biobanking, and industry partnerships

STRETCH GOALS (5+ YEARS)

- Develop an interdisciplinary doctoral program in aging studies, providing Ph.D. students an opportunity to create a degree of their own design
- Create an assisted living/ retirement community on CSU's Main Campus, providing a state-of-the-art living-learning experience that benefits both CSU faculty and students, as well as older adults in Fort Collins
- Develop funding for a longevity interventions clinical trials infrastructure for companion dogs and cats in collaboration with the College of Veterinary Medicine and Biomedical Sciences

Advancing the science of healthy aging–for humans, for animals, for life.

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