

# LIFE LINES



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## Research project explores using robots to help older veterans

Three CHAR faculty members across two colleges are collaborating on a research project to see if the physical and mental health of nursing home residents can be improved with the help of robots.

The principal investigator is the College of Engineering's Naomi Fitter, PhD, and she is working with her colleague Bill Smart, PhD, and the College of Health's Carolyn Aldwin, PhD, in leading the research.

Titled "Robot-Assisted Longitudinal Physical and Cognitive Exercise Interventions for Older Veterans," the project began in 2022 and is sponsored jointly by a three-year, \$262,343 grant from the National Science Foundation and National Institute of Aging.

Dr. Aldwin hopes the research helps address urgent issues related to patient care. "As CHAR faculty are well-aware, we are currently in the midst of a dramatic increase in the number of older adults aged 65+ as Baby Boomers move into the retirement phase," she said.

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# Returning Home for New Beginnings

***Suzanne Segerstrom, PhD, MPH, officially began co-directing the Center for Healthy Aging Research this fall with Dr. Emily Ho. As noted in the Spring issue, Dr. Segerstrom joined the College of Health this year as the Jo Anne Leonard Petersen Endowed Chair for Gerontology and Family Studies.***

## **What drew you to working at OSU?**

I grew up in Oregon! I went to grade school and junior high in Pendleton and then high school (Lakeridge) and college (Lewis & Clark) in Portland. I also was on the West Coast for graduate school at UCLA and my internship at Vancouver Hospital – UBC.

So, when I learned that OSU was hiring for the Petersen Chair in Gerontology and Family Studies, I was excited to put my name in the hat and even more excited to get the job. It feels great to be at OSU, with the Human Development and Family Sciences program, and back in my home state.

## **What has shaped your primary research interests?**

As an undergraduate, I learned about a study in which hospital patients who had a window in their room recovered better than those who did not. That's when I got interested in health psychology and, eventually, in psychoneuroimmunology (PNI, the interactions between the mind, the nervous system, and the immune system). The aging immune system is fascinating because it is both affected by and affects psychological and cognitive health.

When I was learning PNI, there was a lot of research into effects of stress on immunity, but I was interested in why some people and their immune systems were affected by stress and others, not so much.

Over the years, I've seen that optimism, coping, self-regulation, conscientiousness, and repetitive thought such as worry or rumination can account for those differences, either protecting against the immune effects of stress or making them bigger.

I'm also interested in how psychological functions and health are affected by amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease), both in the person with ALS and in the people who love them. Personality and coping could also play an important role in that situation.



*Dr. Segerstrom came to OSU from the University of Kentucky, where she had worked since 1997. She is known internationally for her work as a health psychologist and her research on aging.*

## **As you begin here at OSU, what has been your initial focus?**

One of my new interests is how personality might account for effects of neurological stress. We know that some people have lots of Alzheimer's pathology in their brains but their thinking and memory are normal, and others have little pathology but their thinking and memory are poor. It seems that people who are low in neuroticism (prone to stress and negative emotional states) and high in conscientiousness (goal-directed, organized) might be able to tolerate neurological stress better.

I'm working on a grant application to study this question, and I plan to recruit some participants from the Center for Healthy Aging Research's LIFE Registry.

I hope that people who might be interested in this kind of research will sign up for the Registry! *[See page 6 for more information about the center's LIFE Registry.]*

## **We learned recently that you also have a bachelor's degree in music. How has music been a part of your life?**

I started with a violin class in the Pendleton public schools at age 9. I've played solos, chamber music, and in orchestras almost all my life. I was thinking of a career in music, but what I really loved was playing string quartets, and I wasn't good enough to be a professional. I'm hoping to find some Corvallis people to play amateur chamber music with.

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Aldwin added, “With this increase comes concern about the relatively sparse number of available caregivers, prompting the search for robotic assistance, especially for impaired older adults.”

### Engaging local residents

The project is unusual in that researchers are designing a physical and cognitive exercise intervention with ongoing input not only from experts in the field but also the staff and patients at Oregon Veterans’ Home, a skilled nursing facility in Lebanon.

The three goals are: (1) to design robots to support physical and cognitive needs, (2) to give the robots the ability to learn and adapt over time to maintain relevance and interest, and (3) to deploy the robots for extended periods of time in the skilled nursing facility, which is a novel aspect of the program.

Dr. Fitter said that socially the project

*The research team is considering hooking Nara up to a small Bluetooth speaker to amplify her comments for those who have difficulty hearing her jokes.*



is already a success, and the older adults enjoy visiting and “playing” with the robots. “They especially like getting Nara, as we call the robot, to imitate their movements,” she said.

To maintain this interest, undergraduate intern Kayla Asakawi researched veteran-related humor to help create a series of jokes for the robots to deliver. Dr. Fitter is a stand-up comic on the side and uses a lot of robot humor, which helped with Asakawi’s effort.

### Addressing physical challenges

The group has learned several things from the project’s first year. Their first robot wasn’t articulated at the elbows, so it could only do whole arm exercises, which are often difficult for impaired older adults.

In response, they shifted to a robot type that can bend its elbows to demonstrate simple physical activities and mimic older adults’ movements.

This adjustment was helped by the programming expertise of Rhian Preston, a graduate student involved in the project.

A current challenge involves improving the robot’s ability to sense people’s skeletal frames in their wheelchairs. The team also is working to make robot-led exercises more interesting and easier to follow. Asakawi has researched simple, enjoyable dance moves, such as the Macarena, that can be done with music.

They also are exploring how to program verbal cues for slower dance movements to accommodate participants’ cognitive slowing.

Dr. Fitter said the research team is grateful for the Oregon Veterans’ Home and its enthusiastic embrace of the project, and to the students working on the project, including Preston, Asakawi, Maddie Shippy, Madi Nicole, and Jai’La Crider. Preston has already submitted the group’s first research paper.

## 2023 GERO CONFERENCE HIGHLIGHTS

“Optimizing Mental Health in Later Life” was the focus of the 46th Annual OSU Gerontology Conference.

The conference was held on June 2 at OSU’s CH2M Hill Alumni Center.

One of the keynote speakers, Larry S. Sherman, PhD, played the piano and had the audience singing as he discussed how music influences the aging brain through the nervous system.

Dr. Sherman is a professor of neuroscience at Oregon Health & Science University.

**217** Attendees

**19** Speakers

**47** Certificates issued for continuing education & professional development

The annual conference is a collaborative effort by the OSU Extension Family and Community Health Program, the College of Health, the Center for Healthy Aging Research, and the Center for Health Innovation.

**SAVE THE DATE**

**The 47<sup>th</sup> annual conference will be held May 31, 2024.**

## 2023 awardees grow real-world research skills

CHAR's 2023 LIFE Scholar awardees have successfully completed the summer program's deep dive into aging research.

The undergraduate students worked with faculty mentors on the following projects to expand their science skills in the interdisciplinary realm of healthy aging research:

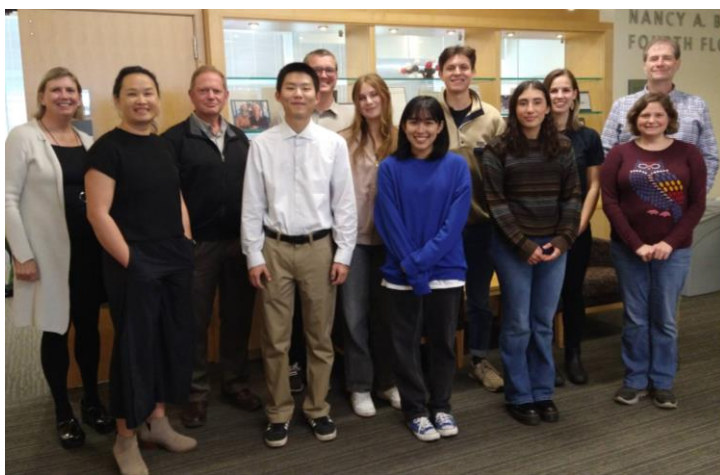
- **Emily Georges** (mentor: Luke Marney) – “Neuroactive Effects of Ashwagandha: From Hindu Belief and Ayurvedic Medicine to Cellular Bioactivity and Mass Spectrometry Characterization of Withanolides and Derivatives”
- **Chaz Kayser** (mentor: Alysia Vrailas-Mortimer) – “Genetic Screen to Identify Interactors for the Aging Gene p38”
- **April Knox** (mentor: Adrian Gombart) – “How Does Toll-Like Receptor Signaling Suppress Vitamin D-Induced Cathelicidin in Human Macrophages?”
- **Lily-Marie Lytle** (mentor: Emily Ho) – “Effects of Almond Consumption and Age on Cardiovascular Health in Persons with Metabolic Syndrome”
- **Najeeb Marun** (mentor: Nathan Mortimer) – “The Therapeutic Potential of Sulforaphane in Alzheimer's Disease Pathology in *Drosophila melanogaster*”
- **Ethan Papenhausen** (mentor: Emily Ho) – “Prevalence of Nrf2-Induced Genes in Peripheral Blood Mononuclear Cells in Men Presenting for Prostate Gland Biopsy”
- **Junghyun Song** (mentor: Arup Indra) – “Investigation on Vitamin D Metabolites for Their Potential Anti-cancer, Anti-aging, and Anti-inflammatory Activities”
- **Philenroza Thavrin** (mentor: Fred Stevens) – “Supraphysiological Intravenous Vitamin C Reprograms Energy Metabolism in Cancer Patients”

### Ann Worthington Endowed Faculty Scholar in Neurodegenerative Disease

The Center for Healthy Aging Research is deeply grateful to the Worthington family for their recently established fund to support research into neurodegenerative diseases.

In 1976, Ann Daneke Worthington graduated from the School of Home Economics, a precursor to today's College of Health, where she studied communications. She spent her career as a real estate agent in Sacramento, California, and, together with her husband, David, raised two daughters.

**COVER PHOTO:** Philenroza Thavrin discusses her research at the Diet & Optimum Health Conference. Thavrin was awarded second place in the conference's Young Investigator Award competition for her formal research presentation.



*LIFE Scholars and mentors gather at a summer social. From left to right: CHAR Co-Directors Suzanne Segerstrom and Emily Ho, Fred Stevens (mentor), Junghyun Song, Luke Marney (mentor), Lily-Marie Lytle, Philenroza Thavrin, Ethan Papenhausen, Emily Georges, April Knox, Alysia Vrailas-Mortimer (mentor), and Adrian Gombart (mentor). Not pictured: Chaz Kayser and Najeeb Marun.*

In September, some of the scholars presented their research at the Linus Pauling Institute's Diet and Optimum Health Conference. Several are planning to present at OSU's Undergraduate Research Conference in the spring.

Several LIFE Scholars are continuing their research with their faculty mentors.

CHAR and faculty mentors together provided a total of \$15,550 to help support the 2023 awardees with stipends this summer.

In 2023, Ann read an article in the *Oregon Stater* alumni magazine about the work being conducted by the Center for Healthy Aging Research. Ann and David decided to plan an estate gift that will establish a faculty scholar position for faculty working with the center on research related to neurodegenerative diseases, particularly Parkinson's. They intend for their fund to lead to better understanding, treatment, and prevention of such diseases.

*For information about giving to support the Center for Healthy Aging Research, contact Jessica Merkner at [jessica.merkner@osufoundation.org](mailto:jessica.merkner@osufoundation.org).*

# Q&A with program graduate Trent Henderson

**We recently spoke with OSU graduate Trent Henderson ('22) to talk about his experience in CHAR's LIFE Scholars Program. Henderson graduated with a bachelor's degree in Nutrition and Health Sciences this spring and started medical school at Des Moines University in Iowa this fall.**



### What inspires your interest in health?

While my parents' professional experience in health care sparked my curiosity, my more academic interest in health began after my year in Argentina as an exchange student. Unsurprisingly, trying out many new and delicious foods led me to gain some extra weight.

After returning and adopting healthier eating habits and exercise routines, I noticed a significant improvement in how I felt. This experience made me wonder why certain foods impact our well-being differently and kindled my desire to explore the science behind nutrition recommendations, ultimately leaving me with more questions than answers!

### How did you learn about the LIFE Scholars Program?

I first heard about the program from a wonderful professor and mentor, Dr. Maret Traber. After taking her course, I became intrigued with her lab's research on vitamin E and inquired about potential involvement.

I knew working with her as my program mentor was the perfect chance to combine a real-world research question about E deficiency and muscle wasting with a longitudinal learning opportunity.

### Describe the experience of being a LIFE Scholar.

Being a LIFE Scholar was a multi-stage journey for me. It started with practicing lab techniques and getting acquainted with basic data analysis. Later, we delved into running actual samples and worked with a large data file to process and visualize changes. During this time, I also presented my work at an on-campus poster symposium.

The presentation experience was fantastic – being able to explain findings at a level that was easy to understand is a skill in and of itself. After graduation, I continued analyzing the data and working on a manuscript during my days off, which was beyond the program.

The program exceeded my expectations, and I learned more than I ever thought I would.

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*This summer, before starting medical school, Henderson worked as a Certified Nursing Assistant in the hospital in his hometown of Bend, Oregon.*

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### How might your experience studying nutrition influence your work in medicine?

I find myself gravitating towards fields where nutrition and lifestyle play a role in prevention or treatment. The field of cardiology also has piqued my interest due to the intriguing physiology of the heart and the fascinating tools used. The connection between diet and cardiac health also fascinates me.

### What would you tell students who are curious about the LIFE Scholars program?

I would highly recommend the program to any student interested in aging and eager to develop their research skills. Working directly with faculty in the field offers a more comprehensive and longitudinal experience than any class could provide. It can be an excellent steppingstone for pursuing advanced degrees involving research.

### Publication:

Henderson's research with his mentor Dr. Maret Traber and collaborators led to the following publication:

Henderson, T.D.; Choi, J.; Leonard, S.W.; Head, B.; Tanguay, R.L.; Barton, C.L.; Traber, M.G. Chronic Vitamin E Deficiency Dysregulates Purine, Phospholipid, and Amino Acid Metabolism in Aging Zebrafish Skeletal Muscle. *Antioxidants* **2023**, *12*, 1160. [doi.org/10.3390/antiox12061160](https://doi.org/10.3390/antiox12061160)

# LIFE Registry informs family caregiver research

A gerontology journal has published the dissertation research of a recent PhD graduate from OSU's Human Development and Family Sciences program.

Shelbie Turner ('22) is the lead author of "Daily Caregiving Appraisals, Future Self-Views, and Physical Activity Goals Among Adult-Daughter Dementia Caregivers," which was published in the August issue of *The Journals of Gerontology Series B Psychological Sciences and Social Sciences*.

"I was curious how caring for their parents impacted caregivers' thoughts of their own future older adulthood and how those thoughts impacted their motivation to pursue their physical activity goals," Turner said.

The article is based on Turner's dissertation, which was titled The ACHIEVE Study (Assessing Caregiver Health in Everyday Contexts). One-third of the caregivers who participated in Turner's study were from the Center for Healthy Aging Research's LIFE Registry (see note below).

In the study, participants identified a physical activity goal that was personally meaningful to them. Each day for 30 days, they reported how successful they were at reaching their goal along with a) how positively or negatively they were thinking about their future older adulthood, and b) how positively or negatively they were thinking about caregiving that day.

Turner found that on days when participating caregivers had more negative thoughts about caregiving, they thought more negatively about their future older selves. In turn, when caregivers thought more negatively about their future older selves in all domains, they reported less physical activity goal pursuit.

Turner noted that a lot of research exists on how people's views about aging impact their motivation to engage in healthy behavior. "My dissertation paper is one of the first

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*The LIFE Registry is a human participant registry of Oregonians who are age 50 and older and who agree to be contacted about research opportunities. To learn more, visit [health.oregonstate.edu/healthy-aging/life-registry](http://health.oregonstate.edu/healthy-aging/life-registry) or call 541-737-5080.*

## Publication:

Turner SG, Hooker K, Chandler KD, Settersten RA Jr, Stawski RS. Daily Caregiving Appraisals, Future Self-Views, and Physical Activity Goals Among Adult-Daughter Dementia Caregivers. *The Journals of Gerontology Series B Psychological Sciences and Social Sciences*. 2023 Nov 14;78(11):1813-1823. [doi.org/10.1093/geronb/gbad119](https://doi.org/10.1093/geronb/gbad119)



*The next iteration of Turner's research will focus on the physical activity goals of dementia family caregivers who have persistent pain. The Gerontologist recently published her manuscript about caregiving with physical pain.*

to bring this area of research to the population of dementia family caregivers," she said. "I felt that doing so was important to better understand how to support caregivers' health in meaningful ways."

Shortly after graduation, Turner began a postdoctoral fellowship with Weill Cornell Medicine's Division of Geriatrics and Palliative Medicine in New York City.

"My goal is to design interventions to support caregivers with pain," she said. "I want to help caregivers maintain their own health and manage their own pain so that they can best provide care to their loved ones."

Turner's ACHIEVE research was supported by a grant from the National Institute on Aging. Her dissertation committee was chaired by Dr. Karen Hooker, and other committee members included Dr. Kelly Chandler, Dr. Richard Settersten, Dr. Robert Stawski, and Dr. Michelle Barnhart.

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## Center For Healthy Aging Research Newsletter

Joan Rutkowski, Newsletter Editor

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