

Potocsnak Longevity Institute

Northwestern University Feinberg School of Medicine



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Introduction

Age stands as the foremost risk factor for the onset of disease and disability; however, we recognize that individuals do not age at a uniform rate. Presently, we find ourselves at a remarkable juncture in human history, with the unraveling of the biology of aging occurring alongside advancements in our capacity to accurately measure biological age. This pivotal moment presents us with the first genuine opportunity to contemplate the slowing or reversal of the aging process within our species.



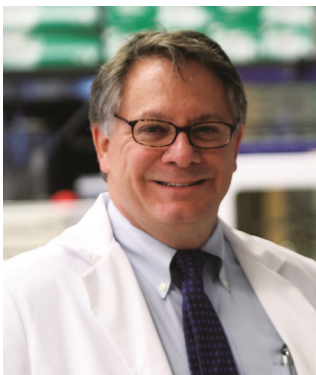
The Potocsnak Longevity Institute brings together investigators from multiple schools, departments, and disciplines across Northwestern with the goal of discovering the causes of accelerated aging and how to delay the aging process. We will apply insights from this work to test therapies and lifestyle interventions as we attempt to slow the trajectory of aging. The ultimate goal of this pioneering work is to leverage the latest research methods available, including artificial intelligence, to measure biological age in humans and to identify broadly accessible interventions that extend the human healthspan, with a focus on slowing the velocity of aging in those disadvantaged due to circumstances or conditions.

Mission and Vision

Funded by a generous gift from Chicago industrialist John Potocsnak and family, the Potocsnak Longevity Institute aims to find ways to slow the aging process in humans and extend the human “healthspan” by delaying the onset of aging-related morbidities—arthritis, dementia, cardiovascular disease, diabetes, cancer, lung disease, and generalized frailty. With the leadership of Director Douglas E. Vaughan, MD, and Associate Director Frank Palella, MD, this institute at Northwestern University Feinberg School of Medicine is destined to make transformative discoveries in the field of human aging.

The institute builds on decades of work by Dr. Vaughan and investigators across Northwestern, studying populations that seem resistant to some of the negative consequences of aging. These include members of an Amish community in Berne, Indiana, who carry a unique genetic variant that appears to provide protection from aging, and a group of cognitively preserved octogenarians called “SuperAgers.” Other projects will continue to seek biological levers that drive aging and investigate approaches—including new drugs—to slow the velocity of aging and extend the healthy lifespan of older adults.

Identifying and characterizing specific factors and processes that are operational in the aging process will allow us to test novel treatments through rigorous, randomized prospective trials. Our overall objectives will be to extend not only the lifespan—but also the healthspan—for all people in our care. We are pursuing this guiding mission daily through state-of-the-art clinical care and research that leads to transformational discovery.



“Through the Potocsnak Longevity Institute, we want to make it possible to not just live longer, but to live healthily for a longer period of time. Aging is the most important risk factor for every disease we care for in adult medicine. If we can push that process back, we can push back the onset of disease.”

Douglas E. Vaughan, MD
Director of the Potocsnak Longevity Institute
Irving S. Cutter Professor of Medicine Emeritus

Education, Clinical, and Research Units

To accomplish its ambitious goals and mission of extending healthspan for all, the Potocsnak Longevity Institute has organized itself into multiple education, clinical, and research units: the Geroscience Academy, the Human Longevity Lab, the Potocsnak Center for HIV & Aging, the Center for Population Science & Aging, the Claude D. Pepper Older Americans' Independence Center, the Center for Basic & Translational Biology, and the Center for Nanoscience & Aging. In addition to these units, the institute also collaborates closely with two established Feinberg research centers, the Mesulam Center for Cognitive Neurology and Alzheimer's Disease and the Center for Applied Health Research on Aging.

Geroscience Academy

The Geroscience Academy is led by Lee Ann Lindquist, MD, MPH, MBA, chief of the Division of Geriatrics at Feinberg. Dr. Lindquist's research focuses on assisting elders to age-in-place. Under her leadership, the Geroscience Academy focuses on educating future clinicians and scientists on the dynamic and evolving science of aging.

Among her objectives:

- Create a formal curriculum in the science of aging including education materials and formal courses for both graduate and continuing medical education (GME/CME);
- Host community engagement activities, including seminars dealing with ethical, economic, political, and societal ramifications of extending human lifespan; and
- Establish an annual award for internationally recognized leaders in our field.

Currently, a Geroscience Academy Grand Rounds, held the final Friday of the month, is established and has attracted a loyal audience.

Human Longevity Lab

The Human Longevity Laboratory (HLL), opened in late fall 2023, is quickly becoming recognized as a preeminent clinical center for measuring biological age, velocity of aging, and will soon begin testing the impact of interventions on biological age. The lab is one of the most complex and innovative components of Northwestern's longevity endeavors. We are now enrolling a diverse population of participants with the aim of constructing a robust, cross-sectional dataset. The HLL protocol provides for the multidimensional measurement of biological age, and includes physiological measures of multiple systems, deep molecular profiling, and artificial intelligence-based tools to ascertain biological age.

The Human Longevity Lab is directed by John Wilkins, MD, associate professor of Medicine (Cardiology) and Preventive Medicine. Dr. Wilkins' expertise in population science, epidemiology, and the construction of cross-sectional databases has been instrumental in organizing the Human Longevity Lab. Working closely with him is Baljash Cheema, MD, MS. Dr. Cheema is a cardiologist with additional specialized training in the application of augmented intelligence to analyze and make sense of complex datasets. While Dr. Wilkins is concentrating on the patient experience and the operational structure and data acquisition of the Human Longevity Lab, Dr. Cheema is concentrating on applying machine learning to this multidimensional dataset, with the goal of creating a distinctly Northwestern AI-based tool for measuring biological age in humans.



Potocsnak Center for Aging & HIV

Aging with HIV infection, which includes premature aging and premature onset of age-related comorbidities compared to the general population, is an urgent public health challenge. Routine use of antiviral medications has allowed persons living with HIV (PLWH) to routinely live into old age. Now, approximately 50 percent of the 1.2 million persons living with HIV in the U.S. are over 50. However, they encounter age-related illnesses at an earlier age than persons without HIV, resulting in so-called “accelerated aging.”

The science behind HIV and aging is a cornerstone of our research and can teach us about the fundamental biology of aging for all. In response to the care-needs research opportunities represented by the growing population of aging PLWH, the Potocsnak Center for Aging & HIV is the first-of-its-kind program dedicated to multidisciplinary, team-based comprehensive patient-centered care and cutting-edge medical research to benefit this population. The center builds upon our existing infrastructure, fortifying resources of current care-centered research programs throughout Northwestern Medicine. Recently the center gained access to data and specimens from the MACS/WIHS Combined Cohort Study. MACS is a Multicenter Cohort Study, a longitudinal study of HIV-infection in men identifying as homosexual and bisexual. WIHS is the Women’s Interagency HIV Study. The two studies merged to form a multi-agency collaborative research effort aimed at understanding and reducing the impact of chronic health conditions affecting those living with HIV.

The Potocsnak Center for Aging & HIV is led by Dr. Palella, the Potocsnak Family – C.S.C. Chair in Infectious Diseases, who is a recognized leader in the Chicago HIV healthcare community. The center emphasis is on integrating clinical services with access to the latest research and especially clinical trials for optimal and personalized care. The objective is to improve overall health and quality of life for aging people living with HIV.

Center for Population Science & Aging

The Center for Population & Aging is focused on defining the genetic, molecular, proteomic, and metabolomic signatures of aging using the power of large human biorepositories and datasets. It is under the direction of Sadiya Khan, MD, MSc, Magerstadt Professor of Cardiovascular Epidemiology. When Dr. Khan describes her own work and the studies the center does, she talks about the intergenerational accumulation of wealth and how we need to start shifting our thinking so that we consider the intergenerational accumulation of health. “Lifespan doesn’t begin at birth, but in utero.” Her work and that of her colleagues emphasizes what is well known, that where you live dictates how long you live, but also is getting at many of the factors behind the geography. Her objective is to push this research into the predictive realm. One of their latest studies looks at how complications in pregnancy predict future cardiovascular issues, which in turn are a factor in healthspan.



“The opportunities to enhance the lives of aging persons, made possible by the Potocsnak Longevity Institute, are simply staggering. Planned activities will span and integrate multiple medical disciplines across basic and clinical sciences and will involve research, education, and innovations in clinical care.”

Frank J. Palella, MD
Associate Director of the Potocsnak Longevity Institute
Director of the Potocsnak Center for Aging & HIV
Potocsnak Family-CSC Professor
Professor of Medicine (Infectious Diseases)

Claude D. Pepper Older Americans' Independence Center

The Pepper Center is one of 15 top-tier research centers in the national network of Older American Independence Centers (OAICs), also known as Pepper Centers. They are supported by the National Institute on Aging to develop and enhance research and education at institutions that already have strong programs in aging research and are named in honor of the late Senator Claude D. Pepper, who championed their creation.

Northwestern's Pepper Center focuses on improving primary care for the management of older and more medically complex adults living with multiple chronic conditions. Led by Michael S. Wolf, PhD, MPH, the focus was chosen because these elders are at higher risk of poor outcomes and costly care. Much of their current work focuses on patients and caregivers' health literacy, prescription management and adherence to physician instructions, and early self-administered tests for cognitive decline.

Center for Basic & Translational Biology

The Center for Basic & Translational Biology will unify existing programs in aging and longevity. There is already a tremendous amount of basic and translational research in the field of aging taking place at Northwestern. Research funding from the National Institute of Aging has risen to more than \$40 million since 2016.

An important component of this center includes the unique opportunity to establish a permanent Northwestern satellite in Berne, Indiana, to expand and accelerate efforts to genotype and deeply phenotype approximately 20,000 adult members of a unique Swiss Amish community. This remarkable kindred harbors a novel gene mutation that appears to protect against biological aging. In this case, Northwestern would be positioned to reveal the results of this multigenerational "natural experiment" and yield institutional distinction for identifying and validating a genetic variant in humans with potential for a robust impact on human aging.

Center for Nanoscience & Aging

Using Northwestern's expertise in nanoscience, bioengineering, and chemistry, the Center for Nanoscience & Aging will focus on and improve our ability to measure the biological age of patients and deliver new precision therapies that alter the trajectory of aging.

Our scientists will develop novel devices to measure specific physiological parameters that reflect age. These might result in less invasive diagnostic procedures, better drug delivery systems, and/or small wearable or implantable devices that monitor and/or improve certain conditions. Eventually, we may be able to track functional changes in real time in patients enrolled in clinical trials. The goal will be to see if we can impact a patient's physiological age, maybe with specific lifestyle interventions or new therapeutics.





An Invitation to Partnership

Through the Potocsnak Longevity Institute and the urgent work we are pursuing, Northwestern will be recognized as one of the leading institutions in the world in the field of human aging and longevity. Generous current and new donors will help us be a driving force in science that prolongs the healthspan of people and improves the human condition worldwide. Please join us in embracing this bold vision. Your commitment will make an extraordinary difference.

For more information about giving to the Potocsnak Longevity Institute, please contact:

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For more information about the Potocsnak Longevity Institute, visit:
www.feinberg.northwestern.edu/sites/longevity

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