Advancing Scientific and Clinical Collaborations in Aging Research

Multidisciplinary collaboration can significantly advance the University of Miami’s wide-ranging scientific, clinical and community studies on aging, according to participants at the Miller School’s first Aging Research Retreat at the Lois Pope LIFE Center.

The retreat focused on multidisciplinary collaboration as the key to advancing studies on aging.

“South Florida has one of the fastest-growing and most-diverse aging populations in the United States,” said Henri Ford, M.D., M.H.A., dean and chief academic officer. “It is imperative to understand the aging processes at the cellular level and develop novel therapies to address specific conditions as well as overall quality of life. Because there is such a wide range of aging research taking place at our university, we must share our knowledge and promote team science.”

At the day-long retreat, researchers from a variety of programs discussed their studies on the genetic and metabolic aspects of aging, potential therapies to slow the aging process, fitness “prescriptions” for better senior health, comprehensive assessments of cognitive, motor and behavior...
impairment, and the need for community-based studies.

“Aging research is one of our top priorities,” said Stephen D. Nimer, M.D., director of Sylvester Comprehensive Cancer Center, the Oscar de la Renta Endowed Chair in Cancer Research, and the Miller School’s executive dean for research, in welcoming the 75-plus attendees. “Bringing faculty together for this retreat, allows us to understand emerging research opportunities, make better use of our resources and keep building important collaborations that will advance opportunities to evaluate novel approaches to diseases of aging.” He later announced a $500,000 pool of grant money from his office to support collaborative aging projects with researchers from different departments.

Key Research Themes and Findings

Fifteen UM faculty members presented their work at the day-long retreat, which was co-hosted by David Loewenstein, Ph.D., professor of psychiatry and behavioral sciences and neurology, and director of the Center for Cognitive Neuroscience and Aging in the Department of Psychiatry and Behavioral Science; and James Galvin, M.D., M.P.H., professor of neurology, chief of the Division of Cognitive Neurology, director of the Comprehensive Center for Brain Health and the Lewy Body Dementia Research Center of Excellence.

“We hope that this spirit of collaboration will extend to other faculty conducting aging research, as well as your post-
doctrinal and graduate students,” Dr. Galvin said.

Later in the retreat, Dr. Loewenstein outlined several themes for advancing the Miller School’s research on aging, including studies of under-represented populations and diverse cultures in South Florida’s unique demographics. “We can also develop longitudinal datasets following changes in individuals as they age, and study what keeps people healthy and resilient,” he said.

**Cellular Mechanisms of Aging**

Maria “Ken” Figueroa, M.D., provided insight into accumulated damage to blood cells due to epigenetic modifiers.

The first set of faculty presentations covered the cellular mechanisms of aging, beginning with “The Nascent Search for Anti-Aging Medicines,” by David Lombard, M.D., Ph.D., clinical professor, leader of the Cancer Metabolism Research Program Initiative, and co-leader of the Research Program within Sylvester Comprehensive Cancer Center.

“Aging is the driving risk factor for cancer, heart and neurological diseases,” Dr. Lombard said. “But we are able to slow the aging rate in experimental models, and studies indicate that cellular stress resistance is correlated with longevity.”

Daniela Frasca, Ph.D., research associate professor of microbiology and immunology, presented her work on “Metabolic
Regulation of Antibody Responses in the Elderly,” regarding strategies to block inflammatory pathways, and Ramiro Verdun, Ph.D., professor of medicine, discussed cellular processes in a talk on “DNA Repair and Aging.”

Maria “Ken” Figueroa, M.D., associate professor of human genetics, co-leader of Sylvester’s Cancer Epigenetics Program and assistant director for translational research, looked at accumulated damage to blood cells due to epigenetic modifiers in her talk on “The Aging Epigenome.”

In his talk on “The Inflammasome in Aging & Medical Conditions,” Juan P. Vaccari, Ph.D., associate professor of neurological surgery, focused on the development of therapeutics and biomarkers for inhibiting the inflammasome, a multiprotein complex implicated in Alzheimer’s disease and other cognitive impairments.

Cognitive Functional Status and Frailty

Rosie E. Curiel Cid, Psy.D.

The second set of presentations on cognitive functional status and frailty began with a presentation on “Physical Activity, Mobility & Risk for Falls,” by Neva Kirk-Sanchez, P.T., Ph.D., professor and chair of the Department of Physical Therapy. “We want to learn more about identifying people at risk for falls,” she said, noting that many people in their 50s and 60s lost their balance when given motor and cognitive tests at the same time. “We also want to maintain community mobility in stroke survivors and older adults, so they are not isolated at home,” she added.
Rosie Curiel, Psy.D., associate professor of psychiatry and behavioral sciences, chief of Cognitive Neuroscience Center for Cognitive Neuroscience and Aging, and behavioral sciences leader of the Florida Alzheimer’s Disease Research Center, looked at “Cognition and Tools for Different Aging Populations.”

Dr. Curiel said “mild cognitive impairment” is not mild inside the brain, which may be damaged by inflammation and a buildup of toxic proteins. “Because cognitive impairments can occur prior to disease, we want to identify cognitive markers in the preclinical stages,” she added.

Dr. David J. Lee

David Lee, Ph.D., professor and chair of the Department of Public Health Sciences, pointed to the value of long-term community-based studies in his talk on “Using Large Established Databases to Study Aging.” He noted the U.S. Health and Retirement Study and the Hispanic Community Health Study, for which UM is one of four nationwide sites. “Longitudinal studies can address hypotheses that are not testable by other means,” he said, citing ongoing studies of the relationship between visual impairments and cognitive decline in older individuals.

Frailty is a syndrome that can predict outcomes of chronic diseases, but it is potentially reversible if identified at an early stage, according to Bonnie Levin, Ph.D., chief of neuropsychology and the Schoninger Professor of Neurology. In a presentation on “The Frailty Phenotype: An Understudied Risk Factor in Middle and Older Life,” she cited weight loss,
weakness, exhaustion, slowness, and low activity as indicators of this syndrome.

Personalized exercise “prescriptions” can help seniors maintain mobility and enjoy a high quality of life, said Joe Signorile, Ph.D., professor of exercise physiology and director of the Laboratory of Neuromuscular Research and Active Aging in the School of Education and Human Development’s Department of Kinesiology and Sport Sciences.

In his talk on “Targeting Functional Decline with Resistance Training,” Dr. Signorile pointed to the importance of maintaining muscle power, as well as strength, for performing the activities of daily living. “Older people can benefit from interval training that targets different aspects of the body’s energy systems,” he said.

Sensory Processes, Conditions, and Special Topics in Aging

Geriatrician Marcio Soares, M.D., shared his research focused on frail older patients at a higher risk for cognitive issues after hospital procedures.

Susan Blanton, Ph.D., professor of human genetics and otolaryngology, opened the third set of presentations on sensory processes, conditions and special topics in aging. She discussed the work of Xue Liu, M.D., Ph.D., professor and vice chair of otolaryngology. “Sensory disorders can serve as early indicators of many aging-related conditions,” she said, noting
that individuals with Parkinson’s disease may lose their sense of smell. “This is a rich field for future research.”

Neuroprotective strategies for glaucoma was the focus of a presentation on “Vision and the Aging Retina” by Vittorio Porciatti, D.Sc., professor of ophthalmology, neuroscience and biomedical engineering, vice chairman of research, and the James L. Knight Professorship in Ophthalmology. He cited a recent study that daily consumption of niacin (vitamin B3) may lower the risk of developing glaucoma.

Developing new therapies was the focus of a presentation on “Drug Discovery and Repurposing for Alzheimer’s and Other Aging Related Diseases” by Claes Wahlestedt, M.D., Ph.D., professor of psychiatry and behavioral sciences, director of the Center for Therapeutic Innovation (CTI), and associate dean for therapeutic innovation at the Miller School. “There are three strategies for developing new therapeutics: drug reformulation or delivery, drug repurposing, and finding new chemical entities,” he said. “We are pursuing all three at the CTI.”

From a clinical perspective, geriatrician Marcio Soares, M.D., chief of geriatrics and palliative medicine, noted the importance of assessing an older patient’s medical strengths and vulnerabilities. His presentation on “The Impact of Perioperative Comprehensive Geriatric Assessment on the Incidence of Postoperative Delirium,” focused on frail older patients at a higher risk for cognitive issues after hospital procedures.

Suresh Pallikkuth, Ph.D., assistant professor of research in microbiology immunology, gave the last faculty presentation. Addressing “HIV and Aging,” he noted that about 50% of people
in the U.S. with HIV are age 50 and over – a percentage that may reach 70% by 2030. “Immune systems in these older adults may be compromised, so flu shots and other vaccines may be less effective,” he said. “We are studying therapeutic strategies to improve antibody responses and reduce health risks in aging individuals.”

Wrapping up the retreat, Dr. Nimer said, “Thank you all for sharing your work and identifying priorities. By working together, we can make great progress.”

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