BYU GERONTOLOGY

2023 NEWSLETTER

FACULTY SPOTLIGHT

Meet Iain Hunter, faculty affiliate in Exercise Science and running mechanics expert.

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2023/2024 CALENDAR

Check out all the important dates for BYU Gerontology, including program events and scholarship deadlines.

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COMMITTEE MEMBERS

We're blessed to have committee members from Public Health; Cell Bio; Nursing; Ex. Science; Psychology; ComD; and Music Education.

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DIRECTOR'S MESSAGE

BY RAY MERRILL

Scientists previously believed that brain connections rapidly developed in early life, reaching their peak in one's 20s. Cognitive ability would then level off in middle age and gradually decline thereafter. However, scientific thinking has changed. Researchers now view the brain as continuing to develop and change across the life span. There is no time when the brain and its functions remain static. Of course, some cognitive functions become weaker with age, but others can improve.

According to an article by the Harvard Medical School, the hippocampus and other brain areas shrink in size as we move into old age. Myelin (an insulating layer) that forms around nerve fibers wears down. This slows communication between neurons. Receptors on the surface of neurons that enable communication with one another may now fail to function effectively. Such changes can affect one's ability to encode new information into memory and retrieve old information that is already stored.

On the other hand, the branching of dendrites, which are specialized extensions of the cell body, increases. Connections between distant brain areas also strengthen. Consequently, the aging brain is better able to detect relationships between different sources of information, grasp the big picture, and understand overall implications of certain issues. In other words, with age the brain is better able to see the big picture, the "forest," but seeing the "leaves" becomes more difficult. Perhaps these changes in the aging brain are the foundation of wisdom. As it says in the bible, "Wisdom belongs to the aged and understanding to the old" (Job 12:12).

The greatest risk factor for brain disease is age, wherein brain structure and function are affected. Alzheimer's and other types of dementia result in abnormal clumping of proteins that form plaques and tangles, which damage brain tissue. Some common diseases in older age (e.g., diabetes and heart disease), medications, poor vision, hearing loss, sleep disturbances, and stress and depression can adversely affect brain function and cognitive ability. Exercise is an effective way to avoid or ameliorate these diseases and conditions. In addition, exercise produces new brain cells in the hippocampus, which increases its volume and improves both short- and long-term memory; improves blood circulation to parts of the brain that correlate with memory and learning; and enhances the prefrontal cortex activity, which is important for executive function, focus and attention.

Changes that occur in the brain as we reach middle age and beyond cause slight slips in memory and ability to learn new information. Normal, age-related cognitive changes may reflect searching for words, taking a little longer to complete a task, occasionally misplacing house keys, needing to focus a little more on conversations in a noisy environment, not remembering what you had for dinner last night, and driving more slowly. More serious cognitive decline, which should involve seeing a doctor, may involve using the wrong words, having trouble following a series of steps or instructions, not remembering how to drive, not following conversations when background noise or other distractions exist, frequently losing things and finding them in odd places, not remembering what you had for dinner last night even after reminders to jog your memory, and reacting very slowly to stop signs and light changes.

In summary, understanding how memory and thinking ability change in older age is important. There are some positive changes that occur in the brain with age and exercise is one way to help improve memory and thinking in the later years. Exercise can also help reduce the risk factors associated with Alzheimer's and related dementias.

FACULTY SPOTLIGHT

BY JANET FOLSOM

Dr. Iain Hunter completed a mathematics education degree with a coaching minor at BYU followed by a Master's of Education in coaching. His interests in biomechanics grew during his master's degree which led him to continue education with a PhD in Health and Human Performance at Oregon State University. He teaches biomechanics while working with USA Track and Field applying his research to elite distance runners.

In 2022, Iain spoke at the Russell B. Clark Gerontology Conference here at BYU. He shared a conversation he had when he was 36 with an older runner. The older runner said as Iain was finishing a run, "You know, it's amazing that you can still run as well as you do for how old you are." Having not thought much about age, he thanked him and then asked him how his running was going. The older runner told him that he runs every day, but recovery is harder and that it all changed when he turned 40. That was when it all went downhill. Unable to forget the conversation, he turned to several older legendary distance runners who basically said, "age is just a number" and he tried to pretend that aging doesn't happen. He went on to say that this attitude can be good, but it can also lead to injury If you start pushing beyond your abilities.

Some of the changes older runners experience are: lower maximum heart rate; decrease in muscle mass; loss of fast-twitch muscle fibers; decrease in bone density; and neuromuscular changes that lead to decreased balance and stability. To diminish these changes Iain recommends:

- Resistance training
- Interval training
- Racing
- Nutrition, eat your vegetables and get your iron and protein.
- Take time to recover by modifying the number of miles, intensity, or surface.

There are many factors out of our control and many factors in our control related to how our bodies will handle aging. This leads to a variation of outcomes that we need to expect, and we need to figure out our own path and what will work well for us.

Iain concluded by saying, "So, when we obtain the right reasons to run, it will not matter very much how old we are, what the outcome of each training cycle is, what injuries or setbacks we had in the past, any of those things. What is going to matter? It's the moments in nature, the feelings of exhilaration and racing and training, the lessons learned, and most importantly the relationships we made along the way. That's what's going to provide the motivation for us to continue on in whatever way our bodies will allow us as we grow older."

CURRICULUM ADDITIONS

This was a great year for the Gerontology Program at BYU. We are excited about the changes made to the gerontology curriculum, which will be effective Fall Semester 2023. One important addition is GERO 399R, which is a new internship course specific to Gerontology. This course will be an important benefit to those students who do not have an internship available to them through their major. Additionally, we have added eight important classes to our core and elective list.

These new additions can be seen on our website.

GERONTOLOGY STUDENTS

STUDENT ASSOCIATION

BY NATALIE BROWER

The BYU Gerontology Student Association planned their first Student and Senior Luncheon which was held in March 2023. Students across campus were invited to attend, along with several seniors in the community. Students and seniors were paired up, and after conversing over a nice BYU-catered meal, they shared different skills, memories, and stories with each other. Some of these skills included juggling, guitar-playing, and headstands. Others simply engaged in meaningful conversations with their partner for the duration of the event. Participants also listened to a presentation led by Dr. Corinna Tanner, a BYU Nursing Professor, who discussed the importance of bridging the gap of generations through interactions and learning from each other. Both the students and senior guests who attended this event left with new friends and meaningful connections, having learned a little more about each other and the benefits of connection between generations.

SCHOLARSHIPS & AWARDS

2022 Service Award Recipients majored in Public Health; Exercise Science; Nursing; Communication Disorders; Exercise and Wellness; Family Life; Sociology; Economics; Psychology; Biology; and Physiology & Developmental Biology.

2023 Academic Scholarship Recipients majored in Psychology; Exercise and Wellness; Communication Disorders; Nursing; Exercise Science; Biology; Dietetics; and Physiology & Developmental Biology.

2023 Graduate Student Fellowships went to four students in the following fields: Micro & Molecular Biology; Marriage, Family & Human Development; Communication disorders; and Biology.

PROGRAM EVENTS

BY JANET FOLSOM

32ND ANNUAL RUSSELL B. CLARK GERONTOLOGY CONFERENCE

The 32nd Annual Russell B. Clark Gerontology Conference took place on March 14-15, gathering experts, researchers, program donors, students, and community members. The conference provided a valuable platform for sharing insights and advancements in elderly health and well-being.

Day 1: Addressing Late-Life Insomnia
The first day commenced with a poster session where students presented their gerontological research. In the evening, a conference dinner was held for donors, faculty affiliates, student scholarship awardees, research grant recipients and other individuals closely associated with the gerontology program. Following the dinner was the keynote address by Dr. Kenneth Lichstein. His presentation, titled "Psychological Treatment of Late-Life Insomnia," shed light on the challenges older individuals face with sleep disturbances and presented treatments that alleviate this issue.

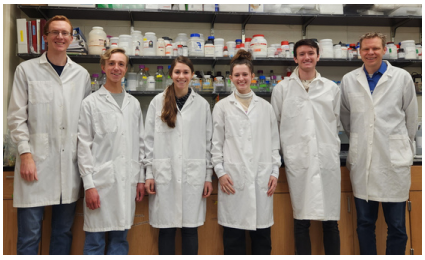
Day 2: Brain Health, Active Aging & Healthy Sleep
The second day of the conference focused on brain health, active aging and healthy sleep. Kelli Charlton presented "Six Core Brain Optimizers," with insights into enhancing cognitive function in older adults. Kelli highlighted six key factors crucial for optimizing brain health: Hydration, Nutrition, Physical Exercise, Fatigue, Medication Management and Sensory Disruption. Next, Kyle Case, CEO HWSG spoke on, "Active Aging Through Competition," highlighting the effect athletic competition has on older adults as a motivator in regular physical activity and long-term physical benefits. He presented statistics showing significantly lower numbers of cardiovascular disease and type 2 diabetes in senior athletes. In an interesting continuation of his research, Dr. Kenneth Lichstein presented again, focusing on "Healthy, Fulfilling Sleep in Older Adults." From his findings, he offered positive and optimistic insight into the quality of sleep older individuals can expect to have.

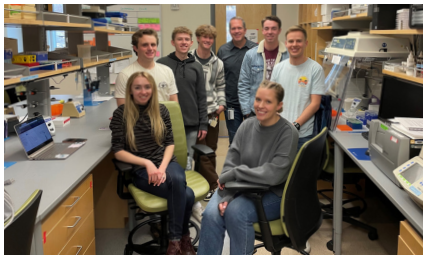
Following the health presentations, a Question-and-Answer session was held providing the audience with the opportunity to further participate in discussions on healthy aging. The 32nd Annual Russell B. Clark Gerontology Conference proved to be an illuminating event in promoting healthier aging by addressing the topics of late-life insomnia, brain health optimization, and active aging.

HUNTSMAN WORLD SENIOR GAMES

91 BYU students provided approximately 12,000 health screenings for athletes in 2022! Many of them received internship credit for their volunteer hours. Ron Hager has organized this volunteer experience for 20 years. Student travel, food, and lodging expenses were covered.

Students may now sign up for 2023 HWSG being held Oct 11-13 and 17-19.





FACULTY RESEARCH

CURRENT INTERNALLY FUNDED RESEARCH PROJECTS

Brad Bundy (PI) and Brent Nielsen, Chemical Engineering, Microbiology and Molecular Biology:
"Toward Patient-Specific Dosage of Glutamine for Increased Life Expectancy and Quality of Life: Engineering an At-Home, Paper, Human-Saliva-Based Cell-free Protein Synthesis Biosensor for Glutamine"

Dallin Bailey, Communication Disorders:
"The Role of Mental Practice on Speech Motor Learning in Older Adults and Adults with Apraxia of Speech"

Julianne Grose (PI) and Mary Davis, Microbiology and Molecular Biology:
"Identifying new potential drug targets in the pathways of aging through the characterization of human USF1 variants - a multidisciplinary approach"

Michael Larson, Psychology:
"A Randomized Controlled Study of Heart Rate Variability Biofeedback in an Older Adult Sample"

David Thomson, Cell Biology and Physiology:
"Pharmacological LKB1 Activation as a Strategy Against Senescence of Skeletal Muscle Precursor Cells"

RECENTLY PUBLISHED BY GERONTOLOGY FACULTY

Niwako Yamawaki, Hiroko Kukihara, and Michiyo Ando
The effects of yoga and mindful meditation on elderly care worker's burnout

Sam Tsugawa
Intergenerational music teaching and learning among preservice music teachers and senior adult musicians

Scott Weber, Perry Ridge, Eric Wilson**, Julianne Grose, John Kauwe**
BYU study takes next step toward treatment for Alzheimer's disease

Perry Ridge & Other Authors
New insights into the genetic etiology of Alzheimer's disease and related dementias

Evan Thacker & Other Authors
Epilepsy, Vascular Risk Factors, and Cognitive Decline in Older Adults: The Cardiovascular Health Study

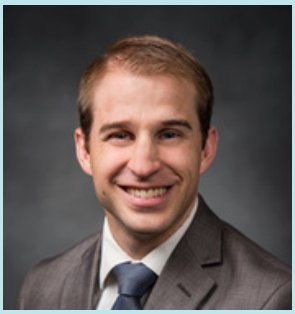
Jeremy Yorgason, Corinna Tanner & Other Authors
The Longitudinal Association of Late-Life Visual and Hearing Difficulty and Cognitive Function

COMMITTEE MEMBERS

RAY MERRILL, PHD
Public Health
Program Director

RON HAGER, PHD
Exercise Sciences

CORINNA TANNER, PHD, MSN,RN
Nursing



TYSON HARMON, PHD
Com. Disorders
Student Assoc. Advisor

DANIEL KAY, PHD
Psychology

SAM TSUGAWA, DMA
Music Education

LEN NOVILLA, MPH
Public Health

ARMINDA SULI, PHD
Cell Biology & Physiology

CALENDAR

Huntsman World Senior Games: October 11-13 & 17-19, 2023

Student Service Award Applications: due October 28, 2023

Faculty Research Grant Proposals: due November 10, 2023

Student Social: January 12, 2024

Faculty Affiliates Luncheon: January 19, 2024

Russell B. Clark Gerontology Conference: March 12-13, 2024

Student Scholarship Applications: due March 22, 2024

Fulton Mentored Research Conference: April 11, 2024

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