

**The University of British Columbia
SCHOOL OF KINESIOLOGY**

COURSE SYLLABUS

Course Code and Title: KIN 500P; Killam Connection: Healthy Aging from Societies to Cells

Class location: Gunn Pavilion Room 200

Class Meeting time(s): Term 2, 2021-2022; Thursdays, 1 – 4pm

Instructor Name: Eli Puterman, PhD

Contact Information: eli.puterman@ubc.ca

Office Hours (scheduled hours, by appointment only, etc.): by appointment

ACKNOWLEDGEMENT OF MUSQUEAM FIRST NATION PEOPLE AND LAND

UBC's Point Grey Campus is located on the traditional, ancestral, occupied, and unceded territory of the xwməθkwəyəm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on in their culture, history, and traditions from one generation to the next on this site.

Course Description

“Healthy Aging from Societies to Cells” will tackle the complexities of healthy aging across the lifespan and support the training of future scientists in developing practical skills in translating scientific knowledge to successfully engage the public. This 12-week course will include UBC, national and international speakers from across the biological, social and behavioural sciences.

Rationale

Healthspans and lifespans vary across individuals, communities, cultures and nations. Many factors underpin a healthier and longer life: our genetics, the healthy and unhealthy behaviours in which we engage, the toxins and infectious agents to which we are exposed, and the diseases we experience. But our bodies are more than just cells, toxins, behaviours, and diseases. Our early life experiences at home and in school, the opportunities afforded to us based on our social ranking, economics, and ethnicities, and the communities from which we emerge shape how our cells express themselves to fight toxins and infections, what behaviours we learn, and ultimately, the quality and quantity of our lives. Importantly, social, economic, and structural inequalities can create conditions of living whereby health disparities appear between those emerging from hard-to-reach communities compared to their more privileged counterparts. Hard-to-reach populations may reside within geographically distant communities with little access to the resources often available in larger cities or live within urban

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centres but are marginalized through systemic inequities and are deserving of equity. Link and Phelan highlight key fundamental resources of access to money, power, prestige, and knowledge that perpetuate mental and physical health disparities among individuals who are hard-to-reach. The Wellness Industrial Complex might want us to believe that healthy aging is “one skin cream or injection away,” but the science says otherwise – healthy aging must be addressed at every stage of our lives and communities, from our early years to the golden ones.

In this graduate course, healthy aging will be explored through these lenses – through an examination of the ground breaking research on cellular, social, cultural, behavioural, structural, and environmental factors that intersect to predict how long and well we live, both physically and mentally. This course also seeks to address the current public discourse on healthy aging and the myths about healthy aging that persist in the public sphere.

The following content areas will be covered in the 12 weeks of the course;

1. Omics of longevity;
2. Early life experiences and longevity;
3. Healthy and unhealthy behaviours;
4. Social trajectories, structural inequalities and health disparities;
5. Health disparities and healthy aging in Canada’s Indigenous Peoples;
6. Public discourse on aging and knowledge translation.

Aims and Outcomes

Students will be provided the opportunity to develop skills integrating their knowledge from this course and scientific backgrounds for the purpose of translating the content effectively. The aim of the course is to guide students into envisioning well-health from multiple perspectives, and disease or ill-health as not a deficiency of individuals, but more likely a result of complex interactions between society, social structures, economics, climate, and one’s social connections and biology.

Specific Learning Objectives:

The following is the list of course sections and materials likely covered in the course.

1. Omics of longevity

At its most basic level, healthy aging can be drilled down to the health of our

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cells. Aging mechanisms in our cells regulate how well and long we live and influence disease development and its progression. There are nearly 20,000 protein-encoding genes in the human genome that regulate cellular function and organ health. Since behavioural, social, and environmental factors can impact the production of these 20,000 proteins, ultimately shaping healthy aging and disease, emerging scientists from across the disciplines should understand the basic functioning of our cells, tissues and organs, and how health is not the result of just one factor, even at the cellular level. In the course section, Omics of longevity, a review of the groundbreaking field of precision health will be provided, with an examination of the genomics, epigenomics, transcriptomics, proteomics, and metabolomics of health and aging.

2. Early life experiences and longevity

Prenatal and early life experiences can shape the expression of our genes and the trajectories of our health. Prenatal experiences, including maternal environmental, physical and psychological stressors, can alter expression of genes and production of protein postnatally. Adverse childhood experiences, on the one hand, and warmth and care, on the other, further impact cellular aging mechanisms across the lifespan, but can also create environments that shape the engagement in unhealthy or healthy behaviours. In this section of the course, an introduction to the impact of early childhood on health and aging will be provided, with a focus on how early life trauma and intergenerational trauma can impact health, and how resiliency can be borne from trauma.

3. Healthy and unhealthy behaviours

Healthy and unhealthy behaviours come in many forms, including smoking, physical activity and diet. New information about what foods to eat or avoid is constantly being reported, and having a basic understanding of nutritional content and requirements, and their impact on our health, is essential. Similarly, exercise comes in all shapes and forms, and it's important for scientists to understand the role of frequency, intensity, time, and type (FITT) in determining the impact of health across the lifespan and health status. This section of the course will lead to a deeper understanding of the impact of nutrition and exercise and their roles on health.

4. Social trajectories, structural inequalities, and health disparities

The social determinants of health model highlights that our social, economic, and physical environments shape our health, equally, if not more than, our biology and behaviours. In this section of the course, work will be presented highlighting how these structural inequalities drive health disparities in vulnerable and

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underserved populations that ultimately determine how long and well people live.

5. Health disparities and healthy aging in Canada's Indigenous Peoples

There are no greater health disparities in Canada than between Indigenous and non-Indigenous people in Canada. Indigenous Peoples across Canada are at greater risk for all non-communicable diseases as a result of social and economic inequalities and intergenerational traumas that have persisted for generations. Indigenous ways of knowing however provide a way of being for wellness and resilience across the lifespan in the physical, emotional, mental and spiritual realms. Students will be introduced to the health disparities that exist between Indigenous and non-Indigenous people in Canada, and Indigenous ways of knowing that bolster wellness and resilience.

6. Public discourse on aging and knowledge translation

The public has easy access to misrepresentations of scientific studies and, frighteningly, to growing misinformation and fake information that is purposefully created. The course seeks to support students to develop the knowledge and to practice lead to public discussions of the science of healthy aging through a series of public-facing and social media experiences.

Format and Procedures:

How is the course structured and how will classes be carried out? What behavioral expectations does the instructor have for the students in class? This is where specifications for attendance, participation, respect for others, etc. should be spelled out to act as a behavioral guide. If the course has multiple formats (like lecture & recitation, lab and discussion, group learning projects and/or presentations) these should be explained clearly

Course Requirements

Not Applicable

Policies and Expectations

The following is a list of all policies and guidelines that should be included on the course outline. Instructors should not be limited to the three examples included below and may wish to include statements around participation, inclusivity, email and technology in the classroom, and scheduling meetings outside of class time.

Class Attendance

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Regular attendance is expected of students for all lectures and seminars. Students who neglect their academic work and assignments will not receive grades for those assignments. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Academic Accommodation for Students with Disabilities

The University's goal is to ensure fair and consistent treatment of all students, including students with a disability, in accordance with their distinct needs and in a manner consistent with academic principles. Students with a disability who wish to have an academic accommodation should contact Access and Diversity without delay.

Academic Integrity

All UBC students are expected to behave as honest and responsible members of an academic community. Breach of those expectations or failure to follow the appropriate policies, principles, rules, and guidelines of the University with respect to academic honesty may result in disciplinary action. It is your responsibility to become familiar with the University of British Columbia's Academic Honesty and Plagiarism Policies, as well as the Student Declaration and the consequences of violating these policies.

IN CASE OF EMERGENCY

In the event that we experience circumstances which could prevent us from joining in person (COVID-related restrictions, inclement weather, travel restrictions, disruptions to public transit, etc.), we will move our weekly class session to Zoom. A link to that meeting and an Announcement that we are pivoting will be provided in advance.

EMAIL

Attempting to teach or explain material over e-mail can be difficult and ineffective. **If you have questions about course material or concepts, those questions should be addressed face-to-face during or after class, through zoom or in person.** E-mail should be used for a limited number of reasons, including: scheduling a time to meet during office hours, in cases of emergency that may cause you to miss an assignment deadline, or situations otherwise detailed in class. It may take up to 24 hours to respond to your email during the week and I do not check email on weekends. Please include "KIN 500P" in the subject line of emails, otherwise it will likely get lost in my emails.

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COPYRIGHT

Speakers hold the copyright to their lectures and all course materials presented in class, unless otherwise noted. The copyright also extends to student notes and summaries that substantially reflect these lectures or materials. Materials are made available to students for personal use only. Students may not distribute or reproduce the materials for commercial purposes without speakers' express written consent. No classroom content should be posted to CourseHero or other similar websites.

UNIVERSITY POLICIES

It is your responsibility to become familiar with the University of British Columbia's Academic Honesty and Plagiarism Policies, as well as the Student Declaration and the consequences of violating these policies.

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available here (<https://senate.ubc.ca/policiesresources-support-student-success>).

COURSE EVALUATION

The breakdown of marking for the course is as follows:

1. TWO commentaries on course readings:	25% (each 12.5%)
2. In-class presentation/discussion leadership:	15%
3. In-class participation:	10%
4. Self-assessment of participation:	10%
5. Viewpoint:	40%

If you anticipate that you won't be able to complete an assessment, please contact me **before you miss the assessment**. Assessments will not be rescheduled for any reason other than self-declared medical circumstances,

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compassionate grounds, religious observation or conflicting responsibilities. Please review those policies [here](#):

1. Commentaries on course readings (deadline: day of lecture):

Students will be required to prepare a 1-2 pages commentary (single-spaced) on the weekly reading(s) for 2 of the 11 class lectures, submitted the day prior to class. The commentary should be evidence-based with up to 5 references to support the document. Commentaries can include personal thoughts on the work presented, but should integrate content from the readings, other readings students complete on the topic, integration from other readings in the course or from other courses students completed.

2. In-class presentation/discussion leadership (deadline: day of lecture):

Per class, two students lead discussions on the topic of the week. First, students will each present for 10-15 minutes a summary of their understanding of the materials presented in the readings, in addition to how it integrates in the course readings to date, or other materials that they have read on the topic. Integrating findings from original empirical investigations would add value to the presentation. Following the presentations, the two students will take turns leading discussions on the readings, with prepared questions to address the other students. Questions should be considered thoughtful to provoke conversation and participation.

3. In-class participation:

Students are expected to participate in discussions throughout the course, including, but not limited to, responding to questions posed by the instructor, asking questions, engaging with other students in a discussion of the materials and presentations in a respectful manner. Students are expected to participate during the in-class assignments and demonstrate their knowledge of the topic.

4. Self-assessment of participation (end of term):

At the end of this term, you will be asked to assign yourself a mark for participation in the course. Asking you to assess yourself is a step toward viewing the learning experience as a more collaborative endeavour, in which your own self-evaluation is valued as part of your course mark. You will assign yourself a grade that encompasses the extent to which you participated in class discussions, peer feedback, and discussions.

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FINAL ASSIGNMENT:

5. JAMA-Like Viewpoint (deadline: April 18, 2022):

From the JAMA website: “Viewpoints may address virtually any important topic in medicine, public health, research, discovery, prevention, ethics, health policy, or health law and generally are not linked to a specific article. Viewpoints should be well focused, scholarly, and clearly presented but should not include the findings of new research or data that have not been previously published.”

Maximum length: up to 1200 words of text—or 1000 words of text with 1 small table or figure—and no more than 10 references, which should be as current as possible.

MISSED ASSIGNMENTS

Missing an assignment completely will lead to losing the total grade for that assignment. For graded written assignments, if each assignment were graded on a total of 100, 5 points will be lost daily for late submissions. Class assignments will not be rescheduled for any reason other than a medical issue or family emergency. Written documentation must be presented in order for the assignment to be rescheduled. If you do not contact your instructor, you will be given a score of zero on the assessment.

POLICY ON TEXT-MATCHING SOFTWARE (IF APPLICABLE)

UBC subscribes to Turnitin, an online system that compares written material with the Web and with other material submitted to its database. Faculty, staff, and students can upload submissions and check for duplication of material in other sources and possible plagiarism.

Course Schedule

The topics and speakers for each class are listed below, although this may be subject to change.

The 12-week course will cover the following 11 topics, and listed speakers have agreed to participate in the course. Importantly, UBC faculty members come from across campus.

LECTURE 1

January 13, 2022

Introduction to the course; Dr. Eli Puterman presents course materials, timelines, and evaluation procedures.

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LECTURE 2

January 20, 2022

Title: “I’ll sleep when I’m dead”: Unfortunate links between insufficient sleep and health

Lecturer: Aric Prather, PhD, Associate Professor, University of California San Francisco

Required Readings:

1. Buysse, DJ. (2014) Sleep health: can we define it? Does it matter? *SLEEP*, 37; 9-17.
2. Irwin, MR (2019) Sleep and inflammation: partners in sickness and in health. *Nature reviews immunology*, 19; 702-715.
3. Billings et al., (2021) Disparities in sleep health and potential intervention models: a narrative review. *Chest*, 159; 1232-1240.

LECTURE 3

January 27, 2022

Title: Social Epigenomics

Lecturer: Michael Kobor, PhD, Professor, University of British Columbia

Required Readings:

1. Schmidt K, Merrill SM, Gill R, Miller GE, Gadermann AM, Kobor MS (2021). Society to cell: How child poverty gets “Under the Skin” to influence child development and lifelong health. *Developmental Review*, 61, Sept 2021, 100983.
2. MJ Jones, SR Moore, MS Kobor (2018). Principles and challenges of applying epigenetic epigenetic epidemiology to psychology. *Annual Review of Psychology*, 68, 14-27.
3. Shonkoff, JP, Boyce WT, McEwen BS (2009). Neuroscience, molecular biology, and the childhood roots of health disparities: Building a new framework for health promotion and disease prevention. *JAMA*, 301, 2252-2259.

Lecture 4

February 3, 2022

Title: Healthy aging from organelle (mitochondria) to organism

Lecturer: Martin Picard, PhD, Associate Professor, Columbia University

Required Readings:

1. Picard M, Prather AA, Puterman E, Cuillerier A, Coccia M, Aschbacher K, Burelle Y, Epel ES. (2018). A Mitochondrial Health Index Sensitive to Mood and Caregiving Stress. *Biological Psychiatry*, 84 (1): 9-17.
DOI: [10.1016/j.biopsych.2018.01.012](https://doi.org/10.1016/j.biopsych.2018.01.012)

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2. Picard M, Trumpff C, Burelle Y (2019). Mitochondrial psychobiology: Foundations and applications. *Current Opinions in Behavioral Sciences*, 28, 142-151. doi: [10.1016/j.cobeha.2019.04.015](https://doi.org/10.1016/j.cobeha.2019.04.015)
3. Rosenberg AM, Rausser S, Ren J, Mosharov EV, Sturm G, Ogden RT, Patel P, Soni RK, Lacefield C, Tobin DJ, Paul R, Picard M. (2021). Quantitative mapping of human hair greying and reversal in relation to life stress. *eLife* 2021;10:e67437. DOI: [10.7554/eLife.67437](https://doi.org/10.7554/eLife.67437)
4. Picard M, Sandi C. (2021). The social nature of mitochondria: Implications for human health. *Neuroscience and Biobehavioral Reviews*, 120, 595-610. <https://doi.org/10.1016/j.neubiorev.2020.04.017>

Lecture 5

February 10, 2022

Title: Sense of purpose in life in the context of our rapidly aging society

Lecturer: Eric Kim, PhD, Assistant Professor, University of British Columbia

Required Readings:

1. Kim ES, Kawachi I, Chen Y, Kubzansky PD (2017). Associations between purpose in life and objective measures of physical function in older adults. *JAMA Psychiatry*, E1-E7. doi:10.1001/jamapsychiatry.2017.2145
2. Kim ES, Delaney SW, Kubzansky LD (2019). Sense of purpose in life and cardiovascular disease: Underlying mechanisms and future directions. *Current Cardiology Reports*, 21: 135. <https://doi.org/10.1007/s11886-019-1222-9>.
3. Kim ES, Strecher VJ, Ryff CD (2014). Purpose in life and use of preventive health care services. *Proceedings of the National Academy of Science*, 46, 16331-16336.

Lecture 6

February 17, 2022

Title: TBD

Lecturer: TBD

Required Readings: TBD

Lecture 7

March 3, 2022

Title: Daily health and well-being in the context of aging

Lecturer: Nancy Sin, PhD, Assistant Professor, University of British Columbia

Three articles to read:

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1. Klaiber P, Wen JH, DeLongis A, Sin NL (2021). The ups and downs of daily life during COVID-19: Age differences in affect, stress, and positive events. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 76(2), e30–e37. [DOI: 10.1093/geronb/gbaa096](https://doi.org/10.1093/geronb/gbaa096)
2. Sin NL, Klaiber P, Wen JH, DeLongis A (2021). Helping amid the pandemic: Daily affective and social implications of COVID-19-related prosocial activities. *The Gerontologist*, 61(1), 59-70. [DOI: 10.1093/geront/gnaa140](https://doi.org/10.1093/geront/gnaa140)
3. Sin NL, Graham-Engeland JE, Ong S, Almeida DM (2015). Affective reactivity to daily stressors is associated with elevated inflammation. *Health Psychology*, 34(12), 1154-1165. [DOI: 10.1037/hea0000240](https://doi.org/10.1037/hea0000240)

Lecture 8

March 10, 2022

Title: TBD

Lecturer: Namaste Marsden, PhD

Required Readings; TBD

Lecture 9

March 17, 2022

Title: Health promoting interventions for older adults — impact when delivered at scale

Lecturer: Heather McKay, PhD

Required Readings:

1. McKay HA, Nettlefold L, Sims-Gould J, Macdonald HM, Khan KM, Bauman A (2021). Status quo or drop-off: Do older adults maintain benefits from Choose to Move – A scaled-up physical activity program – 12 months after withdrawing the intervention? *Journal of Physical Activity and Health*, 18, 1236-1244.
2. McKay HA, Macdonald HM, Nettlefold L, Masse LC, Day M, Naylor P-J (2015). Action Schools! BC implementation: from efficacy to effectiveness to scale-up. *British Journal of Sports Medicine*, 49, 210-218.
3. Durlak JA, DuPre EP (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, 41, 327-350.

Lecture 10

March 24, 2022

Title: TBD

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Lecturer: Lauren Brown

Required Readings: TBD

Lecture 11

March 31 2022

Title: Climate change, sustainability, and health: Overview, solutions, and advocacy.

Lecturer: Kristi White, PhD, Assistant Professor

Required Readings:

1. Romanello et al. (2021). The 2021 report of the Lancet Countdown on health and climate change: code red for a healthy future. *Lancet*, 398, 1619-1662.
2. Triguero-Mas M, Anguelovski I, García-Lamarca M, Argüelles L, Perez-del Pulgar C, Shokry G, Connolly JJT, Cole HVS (2021). *Social Science and Medicine*, online only.
3. Waldron I (2018). Re-thinking waste: mapping racial geographies of violence on the colonial landscape. *Environmental Sociology*, 4, 36-53.
4. White MP, Alcock I, Grellier J, Wheeler BW, Hartig T, Warber SL, Bone A, Depledge MH, Fleming LE (2019). Spending at least 120 minutes a week in nature is associated with good health and wellbeing. *Scientific Reports*, 9, 7730.

Lecture 12

April 7, 2020

Title: Aging, Health, and the Body Through Sociological Lens

Lecturer: Laura Hurd, PhD, Professor, UBC's School of Kinesiology

Dr. Hurd's research examines how older adults' perceptions and experiences of their aging bodies are influenced by age, gender, and health norms.

Required Readings

1. Hurd L., Mahal R (2019). "I'm Pleased with my Body": Older Men's Perceptions and Experiences of their Aging Body. *Men and Masculinities*, 1-17.
2. Pack R, Hand C, Rudman DL, Huot S (2019). Governing the ageing body: explicating the negotiation of 'positive' ageing in daily life. *Ageing & Society*, 39(9), 2085-2108
3. Cameron E, Ward P, Mandville-Anstey SA, Coombs A (2019). The female aging body: A systemic review of female perspectives on aging, health, and body image. *Journal of Women & Ageing*, 31(1), 3-17.

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