The Energetics Lab

<u>The Energetics Lab at Northern Michigan University is recruiting a Graduate/Master student to work on</u>:

LINKING HEALTH STATUS TO SEASONAL TELOMERASE ACTIVATION IN HIBERNATING SPECIES
(START DATE FALL 2024)

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In collaboration with Dr. Josh SHARP – Associate Professor Northern Michigan University

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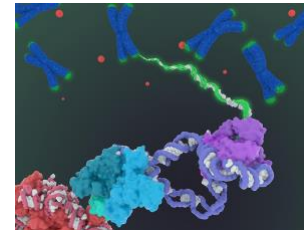
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Project outlines:

According to the United Nations Sustainable Developmental Goals, understanding the determinants of healthy ageing is a priority of modern societies. Studies point to telomere/telomerase as a key couple shaping cell and organism senescence. Telomeres are terminal non-coding DNA sequences of chromosomes guarding genome integrity, which progressively shorten over time due to cell replication and environmental stressors. Critically short telomeres trigger cell death and organism ageing. Telomerase is an enzyme counteracting telomere erosion over time. It extends cell replicative life, hypothetically allowing organisms to live longer. However, by establishing never-ending telomeres, telomerase may also dysregulate the cell apoptosis/renewal equilibrium, leading to malignant cell growth, a process that results in cancer or tumor. Interestingly, several hibernating organisms have the capacity to elongate their telomeres seasonally, questioning the role of telomerase in this process, and suggesting these species might have evolved specific mechanisms for dealing with its potential health costs (*i.e.*, cancer).

This project will aim at revealing the potential links between telomerase activation and individual's health status in a seasonal hibernating species. In particular, this project will investigate the effects of ageing and heterothermic (torpor) expression on telomere length, telomerase expression/activity, and early markers of tumors in a small hibernator, the Garden dormouse (*Eliomys quercinus*).

Tasks during the project: (i) Assess telomerase expression via ddPCR & early markers of tumors by ELISA on previously collected samples from dormice, & (ii) Analyze telomere length and torpor expression data generated from past experiments on garden dormice. There may be an opportunity to work directly with a laboratory colony of another hibernating mammal, the thirteen-lined ground squirrel, beginning in Spring 2025.

Type & duration of position: Paid Graduate Teaching Assistantship – Support available for up to 2 years (4 semesters). Project start: Fall 2024, however an earlier start date might be possible.

The applicant should have a good background in coursework covering animal physiology, biochemistry & molecular biology and the willingness to learn new techniques including molecular methods. Previous experience with statistics & programming, using R software, is required. If you are interested, please contact us as soon as possible by sending a letter of interest, CV, unofficial transcript, and contact information for three references via E-mail. All applications received by January 8th, 2024, will receive full consideration.