NATHAN SHOCK CENTERS OF EXCELLENCE IN THE BASIC BIOLOGY OF AGING

PILOT AWARDEE SPOTLIGHT

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Investigation of the effect of taurine on life- and health-span parameters in yeast and worms

How did you become interested in aging?

My laboratory has been interested in age-related diseases such as obesity, osteoporosis and reproductive failure. The fact that organs are not an isolated silo of metabolic activities and influence each other's functions has led us to hypothesize that alterations in extracellular milieu components either synthesized by the organism, or if essential obtained from the dietary intake affect age-related diseases. This milieu is constituted of endogenous metabolites, hormones, and nutrients, which proffers potential targets for increasing healthy longevity. This has led us to embark, in a systematic way, what molecular components are altered during aging in the extracellular fluid, in an attempt to normalize their levels to youthful levels to cure age-associated diseases and increase healthy lifespan.

Briefly describe your project in non-scientific terms. What questions are you trying to answer?

Micronutrients play essential roles in metabolism and in the maintenance of tissue function and may regulate the aging process. Taurine (2-aminoethanesulfonic acid), an endogenously produced semi-essential micronutrient being investigated in this study, is one of the most abundant amino acids in tissues. Being a β-amino acid, taurine cannot be incorporated into proteins and exists primarily in a free zwitterionic state in the cell. Eukaryotes are able to synthesize taurine endogenously, but some species, such as humans, are more dependent on dietary sources of taurine. In addition, adults have limited capacity to synthesize taurine. Previous studies have shown that the concentration of taurine in blood correlates with health but it is unknown whether taurine abundance affects aging. We aim to fill this gap in our knowledge by investigating the effect of taurine on healthy lifespan in divergent species.

What previous research or experience informed the development of this proposal?

Earlier studies have shown that in the young mice taurine abundance correlates with health of several organs and its deficiency compromises them, but it is unknown whether changes in taurine abundance affects normative aging.

What's exciting about your project's potential impact?

This project has the potential of immediate translation to humans. Taurine is present in animal-based diets and can be obtained from exogenous sources.

If your project is successful, what is the next step?

We are in the process of assembling a multi-centric multi-national randomized clinical trial team to investigate whether taurine supplementation affects healthy lifespan in humans too. If an industry or clinical colleague(s) are interested in joining this effort, they can reach out to us.

How has support from and collaboration with the NSCs helped further this project and/or your research overall?

Nathan Shock Center of Aging, UW led us by Dr. Matt Kaeberlein has helped us investigate the effect of taurine on the health and lifespan of yeast and worm.

Interested in reading more about this research? The *Science* article "Taurine deficiency as a driver of aging", is available here. Dr. Yadav's research was also covered by The New York Times, Forbes, and many other media outlets.