NATHAN SHOCK CENTERS OF EXCELLENCE IN THE BASIC BIOLOGY OF AGING

PILOT AWARDEE SPOTLIGHT

Stephanie Perez, PhD

Assistant Professor
UT Health San Antonio

2022 San Antonio NSC Pilot Awardee

Examination of an AD Related Endophenotype Associated with Perimenopause

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How did you become interested in aging?
Aging has been associated with an increased risk of developing numerous health diseases and conditions. As a researcher, I want to investigate the mechanisms behind disease states that occur with natural aging. Aging can severely affect the quality of life for an individual, as well as the family and caretakers of the elderly. In research, females have been historically understudied, and as a female, I became very interested in the multiyear transition to menopause. During this time, women are vulnerable to a multitude of menopause-related symptoms and have an increased risk for developing neurodegenerative diseases such as Alzheimer's disease.

Briefly describe your project in non-scientific terms. What questions are you trying to answer?
This project focuses on understanding how the transition to menopause, termed perimenopause, affects women's brains and cognitive abilities. Perimenopause is a time when women experience hormonal changes and is linked to an increased risk of developing age-related brain problems. Researchers found that women in their 40s to 60s going through perimenopause and menopause display changes in their brain activity and may have more of a protein called amyloid-beta, which is linked to Alzheimer's disease. We have a preclinical model where we mimic the natural decline in ovarian function and study a brain region that is important for memory and is also affected in Alzheimer's disease. Ultimately, we hope that by understanding how perimenopause affects the brain in this model, we can prevent age-related brain diseases in women.

What previous research or experience informed the development of this proposal?
I am a neuroscientist with specific training and expertise in neuropsychiatric disorders. My research explores sex differences in distinct brain circuits that contribute to neuropsychiatric disorders. By figuring out how these circuits are affected in different disease states, we can begin to understand how this applies specifically to women who develop neuropsychiatric diseases during perimenopause.

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

While Alzheimer's disease is not unique to females, approximately 2/3 of patients living with Alzheimer's dementia worldwide are women. Alzheimer's disease is a progressive and debilitating disease that significantly interferes with daily life activities and can worsen during the transition to menopause. To develop new therapies, we have to first understanding the pathophysiology contributing to Alzheimer's disease during perimenopause.

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

Completion of this project will help us understanding brain regions that contribute to the development of Alzheimer's disease during the transition to menopause and ultimately help to identify novel targets for pharmaceutical intervention. Targeted therapies are currently unavailable and desperately needed to improve quality of life for women during this period.

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

The Nathan Shock Center has provided the necessary funding to collect preliminary data for a grant submission to the National Institute on Aging. As a result, I was recently awarded an R01 to continue my research on the development of neuropsychiatric diseases specifically in females going through the transition to menopause. Further, this funding from the Nathan Shock Center afforded me the opportunity to pursue a line of research separate from my post-doctoral mentor and establish my independence as a scientist. In doing so, I was recently promoted to Assistant Professor/Research where I can now continue my personal research interests in the aging field.