

WFSM Women in Medicine and Science

Women's Health Internship Projects

www.wakehealth.edu/School/WIMS/Internships.htm

Women in Medicine and Science (WIMS) is committed to the promotion of women's health and we know that the recruitment of future top-notch researchers and physicians begins at the undergraduate level of college. WIMS coordinates women's health internships between Wake Forest University School of Medicine (WFSM) researchers and healthcare providers and undergraduate students from area colleges who are looking for projects for course credit and/or experience (these are *unpaid* positions).

Projects currently recruiting for interns:

Exploring Novel Therapeutic Options for Triple-negative Breast Cancer (Cancer Biology)

Breast cancer is divided into different sub-types based on molecular profiling or histological analysis. One of these sub-types includes triple-negative breast cancers. These cancers (which lack the estrogen receptor, progesterone receptor, and HER2) are highly aggressive and lack effective therapeutic options.

We have previously shown that triple-negative breast cancer cells harbor defective repair of oxidative DNA damage (ODD). The goal of this project is to explore experimental therapeutic agents for their ability to promote the accumulation of ODD and force cell death in triple-negative breast cancer cells. The research findings will be used to develop a novel therapeutic strategy that exploits the defective repair phenotype and selectively targets triple-negative breast cancer (but not normal) cells. Time commitment for this project is negotiable.

Exploring a Role for BRCA2 in Repair of Oxidative DNA Damage (Cancer Biology)

The Breast Cancer Susceptibility Gene 1 (BRCA1) and Breast Cancer Susceptibility Gene 2 (BRCA2) are tumor suppressors that exert their function through DNA damage response pathways. Both tumor suppressors have well-established roles in the repair of double strand DNA breaks; emerging evidence suggests that BRCA1 also plays a role in repair of oxidative DNA damage (ODD). The goal of this project is to determine whether or not BRCA2 also plays a role in repair of ODD. The research findings will be used to better understand the tumor suppressor function of BRCA2 for purposes of developing novel anti-cancer strategies. Time commitment for this project is negotiable.

Clinical Neuroscience Research Team

The Department of Neurology is looking for a motivated, committed student with an interest or background in neuroscience, neurology, pain, or stress reduction. They are conducting several clinical research studies that you could be involved with, such as evaluating the mechanisms and effects of stress reduction on migraines; evaluating underlying pain mechanisms through experimental heat pain responses; and understanding the genetic basis of headaches. If you are interested in joining a dynamic team that will give you the opportunity to have direct experience with the clinical care of headaches, experimental heat pain responses, and clinical research,

please contact us. Position available for 2019-2020 (Priority goes to those available for the summer 2019).

Effects of Mediterranean and Western diets on Stress Responses and Health in Nonhuman Primates (Comparative Medicine)

The purpose of the project is to determine if diet can ameliorate physiological responses to social stress that are deleterious to health. The intern will be embedded in a research team working on assessing diet effects on multiple systems. The successful intern will choose a data set and analyze it with the help and supervision of others on the research team. There also may be opportunities to attend seminars and research training lectures. This opportunity is available as a part-time or full-time summer position, 20 hrs/week for 6 weeks minimum.

Intervening on Sedentary Behavior to Prevent Weight Regain in Older Adults (Physiology & Pharmacology)

This study is being conducted to help determine the appropriate type, amount and intensity of physical activity most beneficial for preventing weight regain after weight loss in older adults. The study will test the efficacy of an intervention that uses mobile health technology for reducing time spent sitting/lying down on the longer-term maintenance of lost weight.

The study is just beginning and will provide opportunities for up to two interns who are interested in learning about clinical research for the treatment of obesity involving behavioral lifestyle changes, including weight loss and exercise. The intern(s) would assist with study recruitment, data collection and delivery of interventions, as well as attend study-related meetings when available. Data collection would involve assessment of body composition, maximal aerobic capacity testing, physical and muscle function testing, questionnaires, and resting metabolic rate assessments. The intern(s) would also assist with helping during the dietary weight loss classes and supervision of treadmill exercise

The interaction between diabetes and estradiol on brain metabolism in post-menopausal women (Internal Medicine, Section on Gerontology and Geriatric Medicine)

More women than men are diagnosed with dementia and Alzheimer's disease. Recent evidence suggests this may not be just because women live longer; some risk factors for dementia may affect men and women differently. Type 2 diabetes (T2D) is a major risk factor for dementia. It affects about 26% of the population over the age of 65 and increases the risk for dementia by 50-60%. Recent studies show T2D may be a bigger dementia risk for women than men, and estrogen levels may be important in the increased risk.

A recent study from France found that women who had T2D and were also in the top 25% for natural levels of estrogen in their blood had 14 times the risk for dementia compared to T2D women with lower estrogen. We propose to directly test in humans the hypothesis that the HCB theory explains the population-level observation that estrogen interacts with T2D to increase dementia risk. We propose to collect positron emission tomography (PET) scans that measure uptake of ketones and glucose in women with and without T2D before and after 12 weeks of using an estrogen patch. This is an innovative, proof-of-concept study that uses new techniques to explore a novel, modifiable interaction between estrogen and a common disease on dementia

risk in women. This project can accommodate one student and the time commitment is negotiable.

Risk of great vessel hemorrhage secondary to tadalafil (Cialis) exposure (Pathology)

Male mice exposed to anti-fibrotic agents such as tadalafil were observed to have aortic dissections and vascular lesions. Occasional clinical cases of aortic rupture with tadalafil or phosphodiesterase 5 inhibitor classes of drug have been reported. Only males were affected for reasons that are unknown but this observation is particularly important as older men are commonly prescribed tadalafil for erectile dysfunction and thus at risk for drug interactions with other anti-fibrotic agents. We are looking for students interested in pathology, cardiovascular health or pharmacology to evaluate the lesions and investigate the differences between male and female mice. This project can accommodate one student.

NexTSTEPS: A SUPPORTIVE CARE PROGRAM FOR ADVANCED CANCER PATIENTS AND THEIR CAREGIVERS (Division of Public Health Sciences- Department of Social Sciences and Health Policy)

We are seeking 1-2 students who are interested in joining our team to gain clinical research experience in the area of psychosocial oncology. The study seeks to evaluate an intervention developed to empower advanced lung cancer patients and their caregivers and improve their quality of life and provide skills training in six domains that are central to patient and caregiver quality of life and psychosocial adjustment in lung cancer. Students must be motivated, proactive, and dependable. Applicants should have an interest in behavioral research pertaining to psychosocial oncology, quality of life, and/or family caregiving. Time commitment is negotiable. This project can accommodate up to 2 students.

Endometrial Organoids as a Model to Study Endometriosis and Infertility

BCL6 and SIRT1 are two specific biomarkers that are associated with endometrial dysfunction related to endometriosis and progesterone resistance. Endometriosis is a primary cause of pain and infertility in reproductive aged women, but its underlying pathophysiology remains poorly understood. In this project we propose to develop endometrial organoids in 3-D cell culture as a model to study endometrial dysfunction associated with endometriosis. Organoids are derived from stem cell populations from a variety of tissues and are self-sustaining clones that maintain characteristics of their tissue of origin. Endometrial organoids maintain normal gene expression and responsiveness to steroid hormones. This project will develop this technology as it relates to endometrial organoids at Wake Health and begin to explore the use of organoids for the purpose of studying endometriosis and the mechanisms surrounding endometrial dysfunction seen in this disease. Experience in cell biology and cell culture would be considered essential. (References PMID 27222232, 28754906, 29126613).

Approximate time commitment: Summer, part time or full time (negotiable).