

National Institute of Nursing Research

DIVISION OF INTRAMURAL RESEARCH: FOCUS ON SYMPTOM SCIENCE



The mission of the National Institute of Nursing Research (NINR) at the National Institutes of Health is to promote and improve the health of individuals, families, and communities. Within NINR is the Division of Intramural Research (DIR), led by Scientific Director Dr. Ann Cashion. The DIR conducts clinical and basic research, as well as research training, on the interactions among molecular mechanisms underlying a single symptom or cluster of symptoms. The behavioral and environmental influences on individual health outcomes represent another focus of DIR research and training.

Recent Scientific Discoveries



Tracing the Genomic Signature of Fatigue

The fatigue phenotype can be discriminated using a genomic signature. This genomic fatigue signature is composed of

simultaneously expressed, synergistically functioning genes, attributing to a cascade of events that can influence the fatigue experience. (Team led by DIR Principal Investigator (PI) [Dr. Leorey Saligan](#))

Harnessing Genomics to Combat Brain Trauma

The phenotype of chronic neurological symptoms in military personnel with a blast traumatic brain injury (TBI) can be discriminated using a genomic signature. The signature includes a reduction in the expression of protein ubiquitination genes, which relate to neuronal recovery by preventing accumulation of over-oxidized proteins in neurons that are injured by blast. (Team led by DIR PI [Dr. Jessica Gill](#))

Deciphering the Genomic Origins of GI Pain

Brain-Gut-Microbiota signaling in digestive disorders such as Irritable Bowel Syndrome involves a complex interaction of immune, inflammatory, and neuroimmune pathways. A unique algorithmic signature predicts GI clinical phenotypes as well as response to therapeutic interventions. (Team led by DIR PI [Dr. Wendy Henderson](#))

Catch the Latest DIR Science at NINRnews



To learn the latest about DIR and its areas of science, check out NINR's YouTube channel, which features videos of DIR leaders, PIs, and pre and postdoctoral trainees, including Graduate Partnerships Program (GPP) fellows.

To watch visit www.youtube.com/NINRnews.



NINR's 2014 Big Data Boot Camp drew nearly 100 participants. Visit www.ninr.nih.gov/BootCamp for more information.



www.ninr.nih.gov/DIR



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Clinical Investigations



Genomic and Clinical Biomarkers Unit (Principal Investigator: Dr. Ann Cashion)

The Clinical Biomarker Unit conducts research to discover biomarkers, within an environmental and clinical context, to predict patient outcomes and guide therapies specifically in solid organ transplant recipients, but also expanding to other diseases/disorders and patient populations. For solid organ transplant recipients, the goal is to discover biomarkers that will identify those patients most at risk for weight gain, and, that can be used to provide personalized strategies to prevent weight gain and resulting co-morbidities (e.g., diabetes and cardiovascular disease).



Cardiovascular Symptoms Unit (Principal Investigator: Dr. Marguerite Engler)

The primary research goal is to determine the role of various nutrients in the prevention and treatment of cardiovascular diseases. Basic lab science and clinical studies are used to explore the heart-protective effects of specific nutrients such as blackcurrant and omega-3 fatty acids. To assess the condition of blood vessels in study participants, a cutting-edge non-invasive ultrasound technique is used. Other research interests include finding the optimal biomarker to identify non-symptomatic individuals at high risk for developing cardiovascular diseases.



Vascular Biology Unit (Principal Investigator: Dr. Mary Engler)

The research focus is on nutritional interventions and vascular biology in the prevention and treatment of cardiovascular disease. The effects of certain flavonoids, found in fruits and vegetables, on vascular endothelial function, arterial stiffness, oxidative stress, inflammatory and vascular biomarkers, blood lipid profiles, and blood pressure are being investigated. As genetic variations and protein expression may influence reaction to dietary therapies, genomic and proteomic profiles are examined to develop personalized nutrition programs to improve cardiovascular health.



Brain Injury Unit (Principal Investigator: Dr. Jessica Gill)

Research in this area examines the risks for post-concussive syndrome (PCS) and post-traumatic stress disorder (PTSD) following a traumatic brain injury (TBI) using genomic analysis methods and proteomics. The purposes are to design screening methods to approximate psychological and neurological risks following TBI and to develop interventions to treat early PCS/PTSD symptoms.



Digestive Disorders Unit (Principal Investigator: Dr. Wendy Henderson)

This research seeks to improve the understanding of mechanisms involved in symptom distress related to digestive disorders, specifically the biobehavioral relationships between inflammation and patient symptoms. The goal of this research is to identify genetic and biologic/physiologic factors to improve diagnoses and better predict patient-related clinical outcomes.



Neuromuscular Symptoms Unit (Principal Investigator: Dr. Katy Meilleur)

The focus of this research is to measure and treat symptoms of various congenital muscle diseases, most of which have no treatment and are associated with severe morbidities and mortality. Clinical outcome measures are being tested for feasibility, validity, and reliability in preparation for clinical trials. The purpose is to try to find treatments for patients with congenital muscle disease.



Symptom Biology Unit (Principal Investigator: Dr. Leorey Saligan)

Research in this area examines the nature and causes of fatigue, in relation to conditions such as sarcoidosis and in association with cancer treatments. The purpose is to develop more effective ways to manage fatigue and, as a result, improve overall treatment outcomes. Research in this unit also focuses on pain associated with fibromyalgia.