UC RIVERSIDE
School of Medicine
DIVISION OF BIOMEDICAL SCIENCES

PH.D. DISSERTATION DEFENSE OF

JESSICA NOLL

Biomedical Sciences PhD Candidate
Ford Lab
Dr. Byron Ford, Chairperson

Spatiotemporal Neuroprotection and Early Regeneration after Ischemic Stroke with Neuregulin-1 Treatment

Stroke is ranked as the fifth leading cause of death and the leading cause of adult disability. Unfortunately, Tissue Plasminogen Activator is the only FDA approved stroke treatment but does not address neuroprotection, inflammation, or long-term neurodegenerative damage. Neuregulin-1 (NRG-1) has demonstrated promise as an acute neuroprotective, anti-inflammatory, and neuroregenerative agent in animal stroke models. However, the spatial cellular and inflammatory mechanisms occurring early after ischemic stroke and with NRG-1 treatment have yet to be elucidated.

Here, we demonstrate that NRG-1 treatment can provide acute neuroprotection in male and female mice via intra-arterial and intravenous administrative methods after ischemia. Additionally, endogenous as well exogenous NRG-1 can provide extensive acute neuroprotection. We then characterize distinct post-ischemia spatial proteomic profiles and demonstrate a novel mechanism by which delayed NRG-1 treatment alters those toward a late neuroprotective and early neuroregenerative profile. Ultimately, we identify NRG-1 as a potent ischemic therapeutic capable of inducing immediate and late neuroprotection, early neuroregeneration, and extending the therapeutic treatment window.

Monday, July 19, 2021
10:00 am (PST)
https://ucr-edu-hipaa.zoom.us/my/fordlab?pwd=ZHdPRDYvUndTQnZORFkvdG56R1d1dz09