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## Phytochemicals modulating oxidative/inflammatory responses in microglial cells

Microglial cells are the major immune active cells in the brain playing multiple functional roles for maintaining brain health. Besides scavenging cellular debris, these cells become activated in response to injury and release pro-inflammatory and other factors that affect neighboring cells. Activation of microglia has been implicated in a number of neurological diseases. Therefore, it is immensely important to keep microglia healthy in both young and old brain. Our recent studies are focused on the signaling pathways that up and down regulate oxidative/inflammatory response in microglial cells. Our goals also include searching for effective phytochemicals/herbs that can provide therapeutic potentials to mitigate neurodegenerative diseases and aging. Microglial cells respond vividly to bacteria endotoxins (lipopolysaccharides, LPS) which activate the Toll-like receptors leading to induction of the NF- $\kappa$ B transcriptional pathway and production of pro-inflammatory cytokines and nitric oxide. Our studies show that some botanical polyphenols not only are capable of inhibiting LPS-induced NF- $\kappa$ B pathway but also effective in stimulating the Nrf2 antioxidant pathway leading to transcription activation of the Antioxidant Response Element (ARE) and synthesis of antioxidant enzymes such as heme oxygenase-1. We believe that our goals to identify novel phytochemicals targeting these pathways are important for maintaining healthy microglia to fight against neurological diseases and aging.

## Biography

Grace Y Sun emeritus obtained BS in Chemistry from Seattle Pacific University and PhD in Biochemistry from Oregon State University. After holding a Research Scientist position in Cleveland for 7 years, she was recruited to the Biochemistry Department in University of Missouri. As an internationally renowned neuroscientist, she is recognized for her research on brain lipids and signaling pathways in relation to neurodegenerative diseases and aging. Her research experience included serving as Director of the MU Alzheimer's disease research program and project leader in the MU Center for Phytonutrient and Phytochemistry. She is a founding member and Scientific Director for the newly established Center for Translational Neurosciences (CTN) in the MU School of Medicine. Besides training a large number of graduate students and Post-docs, she also is experienced in organizing national and international symposia and meetings. She has published over 300 articles in highly regarded journals. Among the many awards, she received University of Missouri System President's Award for Sustained Excellence in 2012, which was the highest award recognizing faculty achievement at the University.

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