



Quantitative Proteomic Analysis for the Action of Botanicals on Nitrosative-oxidative Stress Signaling

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Consumption of anti-oxidants...may reduce the risk of stroke and other age related neurodegenerative disorders. However, our understanding of the action of botanical anti-oxidants upon brain health is lacking...

These approaches enable us to investigate multi-target actions of botanicals on nitrosative-oxidative stress signaling in disease. In our studies we applied these methods and examined the effects of anti-oxidants from botanicals, including *Sambucus nigra* subsp. *canadensis* (elderberry), *Carnelia sinensis* (green tea), *Allium sativum* (garlic), and *Sutherlandia frutescens* (Sutherlandia) on either endotoxin lipopolysaccharides-induced activation of microglia and/or neurovasculature against ischemia in mice. We observed more proteins with significant alteration in the ischemic brains of mice fed the elderberry diet (2% of freeze-dried whole fruit) as compared to the AIN-93G control diet. We identified unique SNO-proteins and NO adduct on the specific cysteine of SNO-proteins. Characteristic of these SNO-proteins and elucidation of the network of nitrosative-oxidative stress signaling provide valuable insights into molecular mechanism of the botanical anti-oxidants on neuroinflammatory responses and against neurovascular impairment in the prevention of stroke.

Anti-oxidants reduce the number of free radicals that seem to contribute to inflammation and the build-up of the fatty acids that narrow and block blood vessels. Microglia are dormant in the brain unless turned on by the central nervous system's need for protection. If botanical anti-oxidants reduce inflammation and the fatty build-up, then less/fewer signals will be sent to call the microglia into action.

The researchers want to learn about the chemical communication going here through the proteins in order to understand the precise way anti-oxidants found in plants and fruits reduce and reverse nerve and blood vessel inflammation to reduce the risk of ischemic stroke.

A Symposium Note by Christopher J. Patton, MA, MBA