Abstract:

Environmental factors have been implicated in Parkinson’s disease (PD) etiology. Data also suggests that dietary toxins may be important widespread exposures. Heterocyclic amines (HCAs) are primarily produced during high-temperature meat cooking. We have shown in cellular and animal models that HCAs selectively affect dopamine neurons. Since some of these HCAs are structurally very similar to known mitochondrial complex I inhibitors, we hypothesized that HCAs would inhibit mitochondrial function in vitro and cause Parkinsonian symptoms and pathology in vivo. To test our hypothesis, we have conducted mechanistic and neuropathology studies in cellular and rodent models. This seminar focuses on our findings, especially related to effects on bioenergetics and neurotransmission. Future work includes determining the exact mitochondrial effects of these compounds and further characterizing their effects in vivo.