Determining the mechanisms behind the developmental neurotoxic effects of PCBs

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PCB 11 has emerged as a ubiquitous pollutant in multiple regions of the world, and is identified as a byproduct of contemporary pigment production. While more highly chlorinated PCB congeners are known developmental neurotoxicants, essentially nothing is known about the neurotoxic potential of PCB 11. PCB 11 has also been detected in milk samples from supermarkets in California, and I detected this contaminant in bovine serum from cattle across California. Using primary rat neuronal cell cultures I have seen PCB 11 and two of its metabolites increase axonal and dendritic growth in both cortical and hippocampal neurons. These findings introduce diet as an important exposure route to PCB 11 and suggest that PCB 11 may be a developmental neurotoxicant, causing changes in dendritic morphology *in vitro* that correlate with those seen in humans with neurodevelopmental disorders (NDDs). Therefore, the purpose of this proposal is to determine whether *in vivo* developmental exposure to PCB 11 causes developmental neurotoxicity by examining morphological and behavioral endpoints relevant to NDDs, specifically autism spectrum disorder. This proposed research will also determine the role of metabolism on the disposition of PCB 11 in the maternal-neonatal unit and the developmental neurotoxicity of PCB 11.