

**449 Characterization of Polychlorinated Biphenyl Action on Novel Biochemical Pathways in Japanese Quail (*Coturnix japonica*)**

M.E. Barton, University of Maryland College Park / Animal Sciences; T. Porter, University of Maryland / Department of Animal and Avian Sciences; M. Ottinger, University of Houston / Department of Animal and Avian Sciences. **Polychlorinated biphenyls (PCBs) work in a dioxin-like manner to induce cytochrome P450 enzymes activated via the aryl hydrocarbon receptor (AhR); ultimately impacting biological pathways to cause physiological damage including oxidative stress and endocrine disruption. The purpose of this study was to characterize transcript levels in a suite of genes associated with AhR activation, endocrine metabolism, oxidative repair, and energy balance in quail exposed to PCBs. Eggs were dosed on ED3 via air cell injection with increasing concentrations of PCB 126, PCB 77, and two environmentally relevant PCB mixtures found in eggs at the Upper Hudson River. Whole liver was collected from hatchlings within 24 hours of hatch and snap frozen in liquid nitrogen. RNA was extracted using the Qiagen RNeasy extraction kit with Trizol; quantification was performed using Ribogreen (Invitrogen). cDNA synthesis was performed using SuperScript III (Invitrogen). An ethoxyresorufin-O-deethylase (EROD) enzyme activity study on the same samples revealed that EROD was induced with PCB 126 and the two mixtures, but not with PCB 77. This appears to be an example of cytochrome P450 enzyme induction via the AhR, since EROD is the enzyme coded by the cytochrome P450 1A4 (*CYP1A4*) avian gene, which has been shown to be highly differentially expressed with exposure to dioxin-like compounds. We hypothesize that *CYP1A4* and other cytochrome P450 genes that are AhR-mediated (such as *CYP1A5*) will be differentially expressed with PCB 126 and the two mixtures. Furthermore, we hypothesize all four compounds will demonstrate transcriptional changes in hormonal metabolism, energy balance, and oxidative repair. These data provide a more comprehensive profile for the biological action of PCBs, point to connections and crosstalk between pathways, as well as inform future studies in the mechanisms of action of PCBs that extend past the AhR-mediated responses.** \n