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Sp21-103

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Funding Source: A&S Undergraduate Research & Creative Activity Mentorship Program

Effects of Maternal Oxycodone Exposure on Mouse Placental Development

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Maternal opioid use disorder (OUD) has become a prominent public health issue. Many studies have explored the effects of oxycodone use in individuals; however, few have examined how maternal use of oxycodone affects conceptus development. Correlations between maternal OUD and detrimental fetal development effects have been observed. The hemochorial form of placentation present in both humans and mice facilitates the exposure of the developing conceptus to oxycodone as the placenta and maternal blood are in close contact. This project serves as a continuation of a study investigating the effects of maternal oxycodone exposure on mouse placental development. We hypothesize that oxycodone exposure may result in functional changes in the placenta. Twelve CF1 mice received daily doses of either 5 mg oxycodone/kg body weight or saline control via intraperitoneal injection beginning two weeks prior to breeding. Placenta samples were collected at embryonic age 12.5. Prior histological analyses have shown a reduction in the size of the trophoblast giant cell area in placental samples collected from mice exposed to oxycodone. Previous RNA-seq testing indicates gender specific changes in gene expression between the oxycodone and control placenta samples. Quantitative PCR trials were conducted to validate changes observed in eight genes that were DE in OXY female vs CTL female placenta. GAPDH served as the internal reference gene for these trials. The trials confirm an upregulation of *Ceacam11*, *Ceacam12*, *Ceacam14*, *Prl2bl*, *Prl7b*l, and Tpbpb in the oxycodone exposed female placental samples. The downregulation of *Tpbpa* in oxycodone exposed male samples was also confirmed. Quantitative PCR trials are in progress to analyze the expression of *Ceacam11*, *Ceacam12*, *Ceacam13*, *Ceacam14*, *Prl2bl*, *Prl7bl*, *Tpbpa*, and *Tpbpb* in mouse trophoblast stem cells. Results to date suggest that maternal oxycodone exposure does impact the structure and genetic expression of the placenta.