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Impact of Developmental Cigarette Smoke Exposure on Offspring Number and Birth Weight

Megan O. Jacobs

University of Louisville, megan.jacobs.1@louisville.edu

Isaiah Burciaga

University of Louisville, isaiah.burciaga@louisville.edu

Katelyn Chism

University of Louisville, katelyn.chism@louisville.edu

Selma Podbicanin

University of Louisville, selma.podbicanin@louisville.edu

Julia Corman

University of Louisville, julia.corman@louisville.edu

See next page for additional authors

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Authors

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Megan O. Jacobs¹, Isaiah Burciaga¹, Katelyn Chism¹, Selma Podbicanin¹, Julia Corman¹, Anna-Lee Harris¹, Rachel Neal¹, and Cynthia Corbitt¹

¹University of Louisville, Louisville, KY, Department of Biology

ABSTRACT

Tobacco use continues to be the leading cause of preventable death and disease in the United States. Kentucky has the second highest rate of maternal smoking in the country at 15.7%, though the true number is most likely higher due to false self-reports. Maternal cigarette smoking during pregnancy permanently alters intrauterine growth, limits oxygen and nutrient delivery, and is correlated with low birth weight, premature birth, and birth defects. In addition to nicotine, cigarettes contain toxins including cadmium, benzene, arsenic, and formaldehyde. This project focuses on the effects of prenatal cigarette exposure on offspring weight and litter size. We developed a murine model of developmental cigarette exposure utilizing Marlboro Red Cigarettes, as they are the most popular cigarette brand in the world. Female mice were exposed to cigarette smoke for 3 hrs/day starting at 4 days prior to mating and continuing until delivery. At birth, offspring number and general health metrics were collected. No significant differences between our exposure groups were found for litter size or litter weight. This outcome differs from the parent model of 6 hrs/day of CSE, after which low birth weight is exhibited. It should be noted that there was a failed litter of 2 pups from both the sham and CSE groups and that 7 of the mice did not become pregnant, so our sample size is lower than what is typically required to find statistically significant effects of CSE on birth weight in the parent model.
