

## ABSTRACT SUBMISSION FORM

LET'S TALK ABOUT

# SEX + GENDER

Exploring the role of sex and gender on health research



## CHR D 2020: Abstract Submission Form

### Submitter Name

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### Title

PRENATAL CIGARETTE SMOKE EXPOSURE MAY REPROGRAM OFFSPRING LUNGS IN A SEX-SPECIFIC MANNER

### Background

Though the rate of cigarette smoking is decreasing globally, smoking remains a public health concern. While some studies have associated maternal smoking with initiation and exacerbation of asthma and other respiratory illnesses in offspring, studies which investigate how prenatal cigarette smoke (CS) impairs offspring pulmonary function are few.

### Objective

To find this link, we hypothesize that maternal CS reprograms child lung physiology, causing decreased lung function and adult-onset respiratory diseases.

### Methods

We exposed 16 female Balb/c mice to CS beginning two weeks prior to mating and ending at weaning. At birth, half of exposed offspring were cross-fostered to control dams (and vice versa) to generate prenatal only, postnatal only, prenatal and postnatal, and control exposure groups. When pups were 3 months old, lung function measurements were performed using the forced oscillation technique, and analyzed using two-way ANOVA, followed by Tukey's HSD post-hoc test where significant.

### Results

In the prenatal only exposure group, female offspring displayed significantly reduced alveolar functions ( $p=0.0476452$ ) compared to controls while male offspring in the postnatal only exposure group exhibited reduced efficiency of the central conducting airways ( $p=0.0122881$ ) compared to the prenatal only exposure group. Control and CS-exposed dams did not differ significantly in lung function, suggesting that direct CS exposure may have a less persistent or smaller effect on lung function than prenatal CS exposure.

**Conclusion**

The results of this study suggest that prenatal CS exposure compromises pulmonary function in a sex-specific manner. Further research is needed to elucidate the mechanisms that contribute to sex differences in offspring lung function, as well as further characterize the link between prenatal CS exposure and increased predisposition towards respiratory disease. This information can be applied towards the identification of therapies to prevent the harmful effects of prenatal CS exposure on adult pulmonary function and respiratory disease.

**Theme:**

Basic Science

**Do you have a table/figure to upload?**

No

**Are you willing to participate in Goodbear's Den?**

Yes

**Presenter Status:**

Masters Student

**What was your role in the project?**

Perform Experiments

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