### Project Title

**Indoor Air Pollution: The Pulmonary Effects of Ozone-Generating Air Purifiers**

### Objectives/Goals

Although air purifiers are advertised to improve breathing, some air purifiers emit harmful ozone. Approximately 10% of California households own an air purifier that may produce ozone. The purpose of this research is to clarify the pulmonary effects of ozone-generating air purifiers, to determine whether they are helpful or harmful for breathing.

### Methods/Materials

**Experiment #1:** An ozone sensor was used to measure the concentration of ozone at various distances from three ionizing room air purifiers, a personal air purifier, and an ionic pet hair brush.

**Experiment #2:** Spirometry and pulse oximetry was performed on 24 subjects before and after a 2-hour exposure to an ionizing room air purifier.

**Experiment #3:** Spirometry and pulse oximetry was performed on 10 subjects before and after a 3-hour exposure to a personal air purifier which hangs around the neck.

### Results

**Experiment #1:** Some of the ionizing air purifiers tested produced ozone in levels higher than a Stage 3 smog alert.

**Experiment #2:** A 2-hour exposure to an ozone-generating room air purifier reduced an important measure of pulmonary function (FEV1/FVC) among the asthmatics tested.

**Experiment #3:** A three-hour exposure to a personal air purifier caused a statistically significant reduction in pulmonary function among both the whole study population as well as the asthmatic subset (p<0.05).

### Conclusions/Discussion

The ionizing air purifiers I tested produced ozone and had a negative effect on an important measure of pulmonary function (FEV1/FVC).

### Summary Statement

This research demonstrates that certain ozone-generating air purifiers have a negative effect on an important measure of pulmonary function.

### Help Received

I would like to thank my mother Karen Jakpor, an asthmatic, for lending me her pulse oximeter and her microspirometer, and for teaching me how to use them. In addition, I would like to thank her for her editorial assistance. I also wish to thank Eco Sensors, Inc. for donating an ozone monitor for my research.