



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Otana A. Jakpor	Project Number S1515
Project Title Indoor Air Pollution: The Pulmonary Effects of Ozone-Generating Air Purifiers	
<p style="text-align: center;">Abstract</p> <p>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.</p> <p>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.</p> <p>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 ($p < 0.05$).</p> <p>Conclusions/Discussion The ionizing air purifiers I tested produced ozone and had a negative effect on an important measure of pulmonary function (FEV1/FVC).</p>	
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.	