CASE STUDY 4

THE SÃO PAULO UNIVERSITY MEDICAL SCHOOL

PURAFIL AIDES IN RESEARCH
4 THE SÃO PAULO UNIVERSITY MEDICAL SCHOOL

ABOUT SÃO PAULO UNIVERISTY MEDICAL SCHOOL

Located in São Paulo, Brazil, the University of São Paulo (USP) is one of the largest and most influential institutions of higher learning in Latin America. Every year more than 180 students graduate from the medical school at the Univeristy. Researchers and students at the USP Medical School develop research projects in diverse areas of medicine in cooperation with many American and European institutions.

ABOUT THE PROJECT

Researchers at the São Paulo Medical School utilized Purafil's innovative air filtration technology to study chronic air pollution and its adverse effects on prenatal and early childhood lung development. The study focused on the long term health effects associated with extended periods of exposure to ambient levels of nitrogen dioxide (NO_2), sulfur oxides (SOx), volatile organic compounds (VOCs), as well as other pollutants and particulate matter associated with traffic-derived urban air pollution.

During the experiment, researchers created an inhalation system, and placed two groups of lab mice into separate air exposure chambers. One chamber recieved outside ambient air (the exposure chamber) and the other received filtered ambient air (the control chamber). The filtration of the control chamber was performed using a Purafil Side Access (PSA) System, supplied to the University by Purafil's local representative, Borges & Katayama. The PSA was custom-built for the application with six stages of air filtration: TP-25 and TB-60 pre-passes, Purakol and Purafil Select media, and JFL-90 and PH-97 post-filters.

The PSA is designed to remove both particulate and gaseous pollutants from the air of commercial and industrial environments. Purakol and Purafil Select media were incorporated into the filtration process for the efficient removal of nitrogen dioxide (NO_2), sulfur dioxide (SO_2), as well as other various pollutants produced by automobiles and other sources of fossil-fuel combustion. Each day, researchers carefully monitored pollutant levels in each chamber, also ensuring that other factors such as temperature, humidity, air pressure, etc. remained the same and at a constant in both chambers.

The mice were observed in the chambers over an eight month period from August 2005 to April 2006 for nearly all of 24 hours per day, seven days per week. The mice were only removed from their chambers to be switched to other chambers for mating. Researchers created four different exposure groups using the mice and their offspring (some of which also switched chambers mid-way through the experiment): the non-exposed group, the pre-natal group, the postnatal group, and the pre + postnatal group. *All animals received humane care in accordance with the "Principles of Laboratory Animal Care" published by the National Institutes of Health.*

RESULTS OF THE EXPERIMENT

Purafil's presence in the experiment's control chamber aided São Paulo Medical School researchers in reaffirming existing research that reveals the adverse effects from traffic-derived pollutants and particulate matter. When the lung tissue of the mice was examined, it was found that mice grown in ambient levels of air pollution had smaller lungs and thicker coronary arteries. Additionally, the percentage of live births in the control chamber was much larger than in the ambient chamber, where there were many still births.

The control chamber's air, filtered by Purafil equipment, provided an important contrast to the pollution levels in the ambient chamber. This allowed the study to clearly illustrate that constant exposure to ambient air pollution has adverse effects on early childhood lung development. Results of the study were published in the October 2008 issue of *The American Journal of Respiratory and Critical Care Medicine* and several other publications within the field.