Selected Research – Charlene Bayer

Breath Analysis as a Method of Disease Detection: Phase 1

GTRI IRAD

The goal is to investigate breath volatiles in healthy and breast cancer patients to investigate the feasibility of breath volatiles as breast cancer detection diagnostic clinical tool using a simple, inexpensive sample collection device.

Development of Green Schools Program

State of Georgia

The goal is to build a program that encompasses the Georgia Institute of Technology's research and educational activities about schools, energy, architecture, mechanical engineering, sensors research, indoor and outdoor environments, city planning, and sustainable design to the development of a Green School initiative for the State of Georgia.

Building Wellness Consultancy

A variety of air quality related projects including environmental chamber emissions research, indoor air pollutants research in a variety environments such as airplanes, homes, and office buildings, air cleaner research, and air filters research.

Indoor Air Quality and Health Impacts of Humidity and IAQ Problems in Schools and Other buildings

Semco Inc.

The indoor environment in schools with humidity and IAQ problems are investigated for impacts student and teacher health and the indoor environment before and after remediation; and Investigation into Strategic
Ventilation for Isolation of Environmental Tobacco Smoke

Personal Exposure Monitoring Vest Development Project
U.S. Department of Housing and Urban Development

The goal of this project is to develop a personal monitoring vest able to monitor a variety of pollutants that are suspected as being asthmatic aggravators while linking these with pulmonary function tests. The vest will be used to prove or disprove the hypothesis that there exists a causal link between asthma attacks and environmental exposures that can be shown by demonstrating concomitant variation between lung function and environmental contaminant exposure, in subsequent projects.
Role: PI

Environmental Chamber Evaluation Of Gaseous Compounds Removal By Air Cleaner
Salton Hong Kong LTD/Hong Kong

An air cleaner developed for Salton was tested in the GTRI 27.5 m3 environmental chamber for removal efficiency and potential reactive components generation.
Investigation into Flavorant Discloration
Arylessence Inc

The goal of this project was to determine the source of flavorant product discoloration and browning upon storage. GCMS and ICPMS techniques were used.

Nonylphenols in Air
The Coca-Cola Company

During this project the presence and source of airborne nonylphenols were determined in a manufacturing location

Salivary Proteomics
GTRI IRAD

The goal was to investigate salivary proteomics in healthy and diseased individuals in order to investigate the applicability of saliva as a diagnostic clinical tool.

Miniaturized Bioaerosol Capturing/Detection System
GTRI IRAD

The goal is investigate the feasibility of developing a miniaturized bioaerosol capturing/detection system based on the polymeric gel media that has been developed by Dr. Bayer and her group for air filtration.

Advanced Polymeric Gel-Based Air Filtration Technology
Army/TSWG

The goal is to develop a prototype indoor air filter system capable of protecting building occupants from chemical/biological warfare agents. This is a large, multidisciplinary, multi-organization project.
Role: PI

Portable Mold Sensors – Technical Feasibility and Operational Requirements
U.S. Department of Housing and Urban Development

The major goal is to investigate the development of a portable radar-based mold growth device for hard-to-reach indoor surfaces to identify and subsequently minimize mold-related housing hazards.

Development of a Polymeric-Nanoparticle Air Filter
Ecolab Inc.

The goal is the development of a prototype indoor air filter capable of controlling environmental tobacco smoke odors and other airborne contaminants, particularly in hotel rooms. This is a large, multidisciplinary project. A second portion to this grant was the evaluation of activated carbon filters for airborne ETS removal and determining the air pollutant differences between smoking and nonsmoking hotel rooms focusing on odor-causing compounds.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers
The overall goal is to establish and validate a cost-effective, reliable field test method for GPAFE efficiency and service life determination.

Investigating the Causal Links between Asthma and Environmental Exposures
GTRI IRAD

The objective is to develop the first generation of a novel real-time monitoring device to measure environmental airborne contaminant exposures and lung function in asthmatic children, which is being applied to investigating the correlation between asthma and decreased lung function with environmental exposures.

Carpet Emission Rate Testing
Carpet and Rug Institute

During this project the VOC emission rates from carpets over time were investigated. Emission rates were measured in the GTRI 28.3 m3 environmental chamber.