**Institute for a Sustainable Environment**

**and**

**Civil and Environmental Engineering**

**Seminar**

**Challenges and Solutions in Human Exposure Science: From Nanoparticles to Bioaerosols**

**Gediminas “Gedi” Mainelis**

**Professor**

**Department of Environmental Sciences, Rutgers**

**The State University of New Jersey**

**ABSTRACT:**

The Mainelis lab at Rutgers University has been investigating exposures to a variety of health-relevant aerosols ranging from engineered nanoparticles in consumer products and to particles of biological origin. This seminar will discuss some of these research efforts.

Investigation of bioaerosols is an active research area, and here the Mainelis lab has been looking for methods that effectively capture biological aerosols and allow their efficient preservation for later analysis. The recent developments include a novel electrostatic collector, where biological particles are concentrated in a rolling water droplet (5 to 40 microliters); a small, light-weight, low-power and self-contained electrostatic sampler that is suitable for assessing personal exposures; and Rutgers electrostatic passive sampler (REPS), which utilizes unique properties of permanently polarized electroactive polymers and allows collection of airborne microbial agents without the need for any external power sources and air movers.

Another active research area is health and safety of nanotechnology. With the proliferation of nanotechnology-based consumer products, there is a concern about potential inhalation exposures to nanoparticles and their agglomerates due to the use of such products. Over the past few years, we have been investigating the release of and potential exposures to nanoparticles due to the use of nanotechnology-based cosmetic powders, sprays, and clothing. To realistically simulate potential exposures, we used a manikin head with simulated inhalation system and measured particles that would be “inhaled” upon the use of consumer nanoproducts. We found that there would be release and “inhalation” of a broad range of particles from a variety of products. This presentation will discuss the factors affecting such particle release and their deposition in the lung.

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