

# **Worker Exposure Feasibility Study**

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**May 11, 2005**

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**<http://www.envirolab.com>**



## **Worker Exposure Feasibility Study**

**Purpose:** Determine the utility of the *Glaucoma* Swimming Behavior Assay for rapid assessment of Worker Exposure to Deutsche Bank Dust Particles

**Design:**

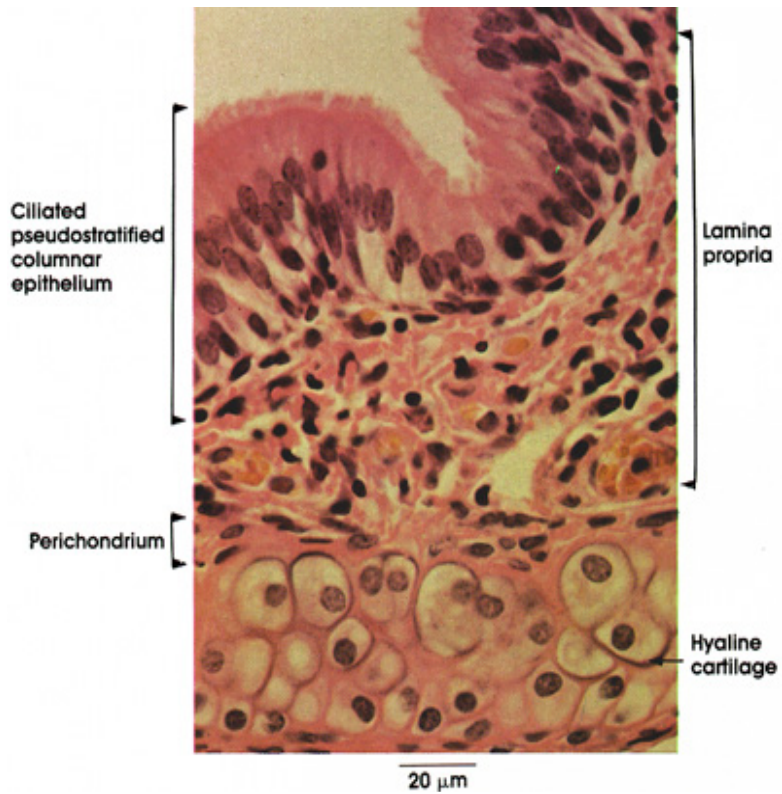
- Personal air monitors will be placed in enclosed areas (Tents) in Deutsche Bank Locations.
- Fans will be used at low, medium, and high speeds to agitate dust and create increased exposure conditions.
- Filters from personal air monitors placed on manikins inside the tent will be removed after exposure intervals of 4, 6, and 8 hours.
- Particles from the filters will be suspended in an aqueous buffer medium and counted using a Spectrex 2000PC Laser Particle Scanner.
- *Glaucoma chattoni* ciliates will be exposed to different concentrations of the particle suspensions and their swimming behavior responses will be measured for periods of 15 minutes. The methods developed by the Woods Hole Oceanographic Institution/Environmental Toxicology Laboratory will be used to establish LOEC (lowest observed effect concentration) and NOEC (no observed effect concentration) for each sample.
- The Swimming Behavior Response data will be compared to measured COPC levels of the same samples (Lead, Asbestos, PAHs, Quartz, and synthetic vitreous fibers).
- Benchmark Swimming Behavior values, based on comparison to COPC values will be established.

**Significance:**

- Rapid Assessment of Particle Toxicity will provide an early warning signal.  
(15 minute *Glaucoma* Assay + 15 minute sample preparation)
- On Site Evaluation of Whole Particle Toxicity

**Relevance to Humans:**

The cilia found on the surface of *Glaucoma* ciliates have the identical morphological fine structure as the cilia located on the ciliated epithelium of the human trachea (Figure 1). Thus, toxic agents which cause damage to *Glaucoma* ciliates will have a similar effect on human tracheal ciliated epithelium. The function of the ciliated epithelium cells is to move mucous containing particles out of the respiratory system by coughing and expectorant activity. This process would be impaired by damage to the cilia.



**Tracheal Epithelium**



***Glaucoma chattoni***