



**Results of Blood Plasma Samples for a Group of NYS Personnel  
Responding to the World Trade Center Disaster**

**Introduction**

The collapse of the World Trade Center (WTC) and the fires on September 11, 2001 resulted in the release of pollutants into the air at the site. Some of the pollutants released are called perfluorochemicals (PFCs). PFCs are man-made chemicals commonly used in stain- and soil-resistant coatings on upholstery, carpets, fabrics and leather, and in floor waxes, polishes and fire-fighting foams. They are also found in non-stick cookware. Because PFCs are in so many products, and because they last a long time, most people have some PFCs in their blood. Currently, relatively little is known about possible health effects of PFCs in humans.

**How This Pilot Study Was Done**

Biological samples were collected and stored from 1384 people who were New York State (NYS) employees and National Guard personnel. For about a third of the samples, the plasma part of the blood was analyzed to learn more about the workers' exposure to PFCs from dust and smoke. All of these people had been assigned to work in the area of the WTC between September 11 and December 23, 2001. Sample results were grouped according to how much smoke and dust exposure people had. Sample results were also grouped according to whether people reported having experienced lower respiratory symptoms.

**Pilot Study Findings**

Eight kinds of PFCs were measured in a total of 457 plasma samples, and four kinds of PFCs were detected in almost all samples: Perfluorooctanesulfonate (PFOS), Perfluorooctanoic acid (PFOA), Perfluorohexanesulfonate (PFHxS), and Perfluorononanoic acid (PFNA).

The results of this pilot study indicate that:

- No significant difference was observed in the concentrations of PFCs between groups with lower respiratory symptoms and groups without lower respiratory symptoms
- There were no significant differences found between exposure subgroups for PFOS
- Concentrations of PFHxS were significantly higher in the MDE (more dust exposure) group than in the LDE (less dust exposure) group
- Concentrations of PFNA were significantly higher in the MSE (more smoke exposure) group than in the LSE (less smoke exposure) group
- Significantly higher concentrations of PFOA and PFHxS were found in individuals exposed to smoke than in individuals exposed to dust
- PFOA and PFHxS concentrations were approximately twice as high in some subgroups of WTC responders than the concentrations reported for a U.S. general population

**Conclusions**

The results of this pilot study suggest that some WTC responders were potentially exposed to PFCs, especially PFOA, PFNA, and PFHxS, through inhalation of dust and smoke released during and after the collapse of the WTC.

The potential health implications of these results are unknown at this time. Human studies have not found consistent associations between blood PFC levels and any health effects. In animal studies, PFC blood levels several thousand times higher than the levels found in this pilot study caused effects in the liver. Animal studies have also suggested that exposure to high levels of some PFCs may affect the immune system, endocrine (hormonal) system, and developing organisms. However, it is uncertain whether results from these animal studies are applicable to human populations, who generally have lower levels of exposure to these chemicals. Future studies may help us confirm these findings and may allow us to improve our understanding of the possible health impacts of these compounds.

If you have any questions regarding perfluorochemicals or the laboratory testing involved, you may contact Dr. Kurunthachalam Kannan at 1-518-474-0015. If you have any questions regarding your health as it may relate to these findings, you may contact Dr. Matthew Mauer at 1-518-402-7900.