

# **Nano-Spectrometers with Microstructured Optical Fibers for Chemical Sensing**

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## **Project Summary**

Chemical warfare agent detection and identification are of growing importance to the military and to society as a whole. Threats of toxic agent attacks (or accidents) exist that have the potential to affect military operations and to affect nearby civilian populations. A compact, light weight, reliable optical fiber based chemical weapon agent detector would be beneficial for both portable personal detection for rapid advanced deployment or fixed-site perimeter early warning. The sensors presented offer advantages, such as ruggedness, since they are not susceptible to degradation, humidity, and drastic temperature variations. In addition to portability, these qualities make the *all-glass-fiber with nanospectrometer chip* chemical weapon detection system a good candidate for military operations. Military operations can be subjected to weather conditions of severely cold or hot climates with precipitation. It is also important to have instrumentation with reliable detection without sacrificing cargo space.

The objective of this effort is to develop a microstructured optical fiber (MOF) sensor that is compact, lightweight, sensitive and rugged for vehicle interiors, aircraft, individual personnel, and fixed site locations.