



## SBIR CBD The Chemical and Biological Defense SBIR Program



U.S. Army Research Office

### Immediate Bio-decontamination System

TDA Research, Inc.  
Wheat Ridge, CO  
Research@tda.com  
www.tda.com

TDA Research, Inc. (TDA) is developing a water-based solution to decontaminate equipment contaminated with chemical warfare (CW) and biological warfare (BW) agents. This battery-powered portable system for military and first responders uses an electrolytic cell to produce the active species: chlorine dioxide (ClO<sub>2</sub>) and hypobromite ion (BrO<sup>-</sup>1). The electrochemical decon elegantly resolves the longstanding problem in decontamination: how to provide a very reactive decon solution that is at the same time stable enough that it lasts for years and is safe enough (unreactive) to store and transport without special permits or precautions. The extremely active species are generated only when and where they are needed. The active species is highly reactive, so it finishes its task quickly, then

degrades and does not persist in the environment. The system is stable in storage for up to 10 years with suitable batteries and readily transportable, including shipment on commercial aircraft. The electrochemical decon system rapidly detoxifies the CW agents. It is also active against biological threats including vegetative bacteria, viruses and bacterial spores. Tests according to DoD guidelines have confirmed that the solution is compatible with materials in military equipment, including painted steel and a range of polymers and elastomers.

When used with a battery-powered backpack, the system has the capability to decontaminate a vehicle up to the size of a light truck or High Mobility Multipurpose Wheeled Vehicle (HMMWV); a smaller, handheld unit has also been tested. The system is capable of cold weather operation, including operating in below freezing temperatures. TDA is currently working to carry out tests that will verify efficacy against the BW agent anthrax (*Bacillus anthracis*). TDA plans to apply for EPA registration of the solution as a sporicide effective against anthrax.

#### Phase III Impacts:

This system proposes to be used by the U.S. military and first responders for immediate bio-decontamination of vehicles or equipment contaminated with BW or CW agents. The technology developed will greatly benefit the armed forces by detoxifying chemical agents on contact. The technology TDA Research has developed is a candidate for the Joint Portable Decontamination System (JPDS). To date, roughly \$1.5M in DoD funding has been received for expanded research and development.



Field test with the EC Decon solution applied to a truck tailgate.